EPA

Fact Sheet

Public Comment Start Date: February 15, 2013
Public Comment Expiration Date: April 1, 2013

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Seattle, WA 98101-3140

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

South Fork Coeur d'Alene River Sewer District Page Wastewater Treatment Plant (WWTP)

The EPA proposes to reissue 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

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
Coeur d'Alene Regional Office
2110 Ironwood Parkway

Coeur d'Alene, ID 83814
(208) 769-1404 or toll-free at (887) 370-0017

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, 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.

Documents are Available for Review
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permits, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at http://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID.

U.S. Environmental Protection Agency Region 10
M/S OWW-130
1200 Sixth Avenue
Seattle, Washington 98101-3140
(206) 553-0523 or toll-free at (800) 424-4372

The fact sheet and draft permits are also available at:

U.S. Environmental Protection Agency Region 10
1435 N. Orchard
Boise, ID 83706
(208) 378-5746

U.S. Environmental Protection Agency
Coeur d'Alene Field Office
1910 NW Boulevard
Coeur d'Alene, ID 83814
(208) 664-4588

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1404 or toll-free at (887) 370-0017

Kellogg Public Library
16 West Market Ave.
Kellogg, ID 83837
(208) 786-7231

Mullan Public Library
117 Hunter Ave.
Mullan, ID 83846
(208) 744-1220

Osburn Public Library
921 East Mullan Ave.
Osburn, ID 83849
(208) 752-9711

Kootenai-Shoshone Area Libraries – Pinehurst Branch
107 Main Ave.
Pinehurst, ID 83850
(208) 682-4579

Wallace Public Library
415 River Street
Wallace, Idaho 83873
(208) 752-4571

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Acronyms

1Q10	The lowest 1-day average flow that occurs on average once every 10 years
7Q10	The lowest 7-day average flow that occurs on average once every 10 years
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	The lowest 30-day average flow that occurs on average once every 5 years
30Q10	The lowest 30-day average flow that occurs on average once every 10 years
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BA	Biological Assessment
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
BPT	Best Practicable
°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
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
gpd	Gallons per day
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation
lbs/day	Pounds per day
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LD_{50}	Dose at which 50% of test organisms die in a specified time period
LOEC	Lowest Observed Effect Concentration
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
ML	Minimum Level
MPN	Most Probable Number
N	Nitrogen
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QAP	Quality assurance plan
RPA	Reasonable Potential Analysis
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SIC	Standard Industrial Classification
SPCC	Spill Prevention and Control and Countermeasure
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WET	Whole Effluent Toxicity
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:

South Fork Coeur d'Alene River Sewer District Page Wastewater Treatment Plant NPDES Permit No. ID0021300	Contact: Ross Stout, District Manager 208-753-8041
Physical Address: Page Wastewater Treatment Plant 46643 Silver Valley Road Smelterville, ID 83201	Mailing Address: 1020 Polaris Ave. Osburn, ID 83849

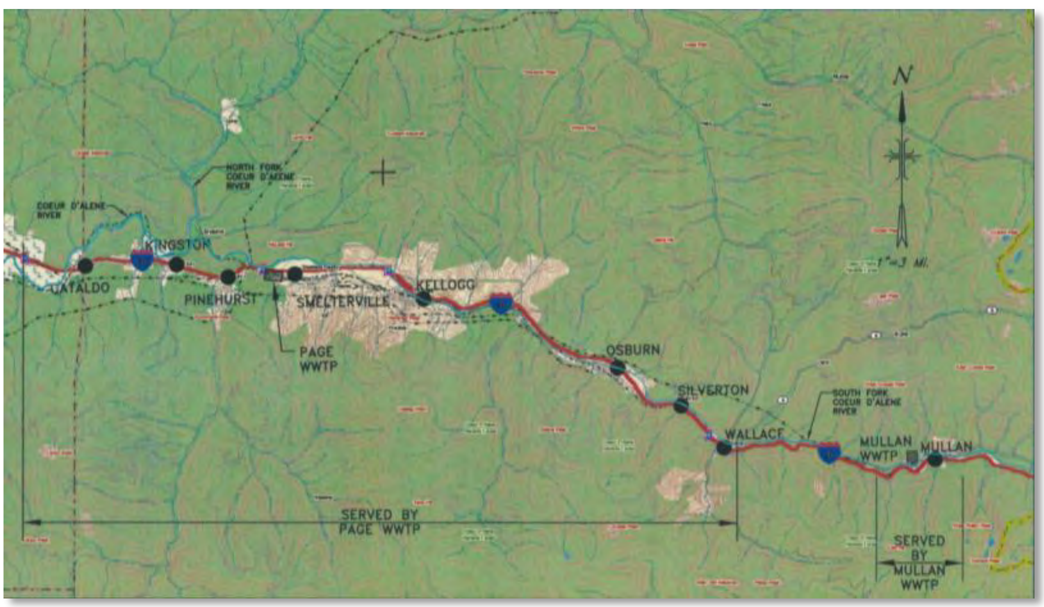


Figure 1. Vicinity Map

B. Permit History

The facility's previous permit became effective on August 1, 2004 and expired on August 1, 2009. A complete application for permit reissuance was submitted to the EPA on January 26, 2009. Since the permit was not reissued before the expiration date of August 1, 2009 and the District submitted a timely application, the permit was administratively extended pursuant to 40 CFR § 122.6.

II. Facility Information

A. Treatment Plant Description

The South Fork Coeur d'Alene River Sewer District (the "District") owns, operates, and maintains the Page wastewater treatment plant (WWTP) located near Smelterville, Idaho in Shoshone County. The WWTP became operational in 1974 and provides treatment equivalent to secondary using partially mixed facultative lagoons, disinfection using chlorine and dechlorination using sodium bisulfite. The WWTP occupies 30 acres within Humboldt Gulch in the central portion of a 70-acre tailings repository that was used by the Page Mill between 1926 and 1968. There are no industrial discharges to the system. The Page WWTP treats domestic and commercial sewage from 22 satellite communities:
Black Cloud,
Elizabeth Park,
Elk Creek,
Kellogg,
Kingston/Cataldo Water and Sewer District,
Moon Gulch,
Montgomery Gulch,
Nine Mile Gulch,
Osburn,
Page,
Pinehurst,
Polaris,
Silverton,
Slaughterhouse Gulch,
Sunny Slope Sewer Association,
Terror Gulch,
Two Mile Gulch,
Wallace,
Wardner,
West Silverton,
Woodland Park,
and Zanettiville

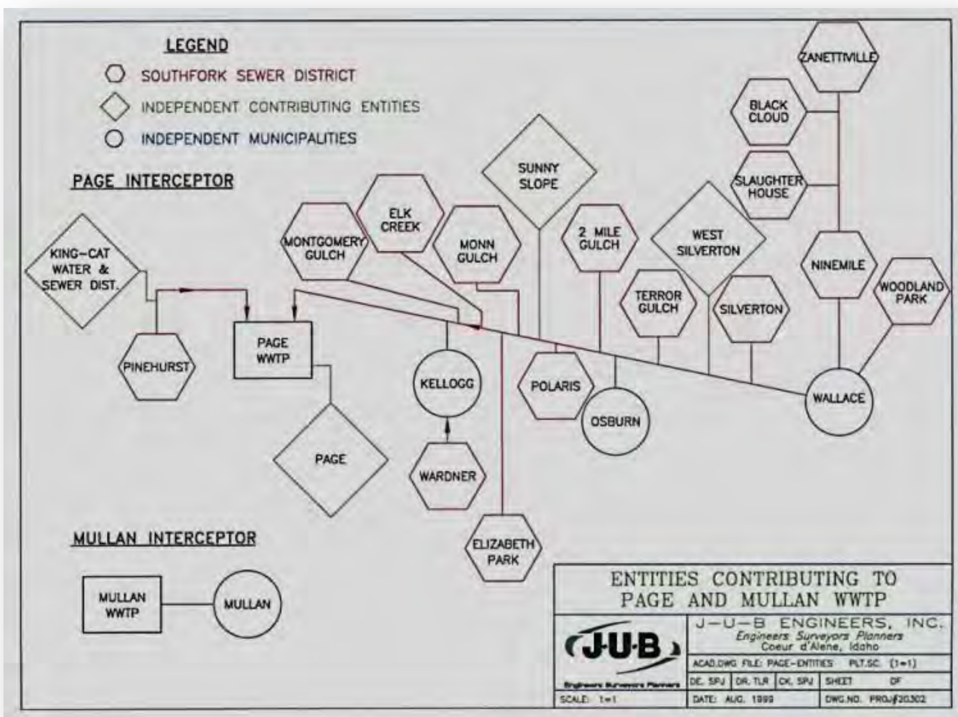


Figure 2. Entities Contributing to Page and Mullan WWTPs

A map showing the location of the Page WWTP and details about the wastewater treatment processes are provided in Appendix A: Process Diagram.

B. Permit Compliance

Compliance with Effluent Limitations

The EPA reviewed the discharge monitoring report (DMR) data for period from August 2004 through July 2011. DMR data for this period of time is presented in Appendix B: Discharge Monitoring Report Summary and Effluent Data.

The facility faced numerous compliance issues during the permit cycle and the extended permit period including violations of the effluent limitations for chlorine, *E. coli*, ammonia, lead and zinc. The permit included a variance from the water quality standards for cadmium, lead and zinc. The facility was unable to achieve the water quality-based limits by the end of the permit cycle. The IDEQ issued a new variance that became effective on July 31, 2009 thus the final permit limits were not put into effect. For additional information on violations refer to the DMR summary in Appendix B (page 42).

Compliance with Whole Effluent Toxicity

The permittee conducted chronic toxicity testing as required by the permit. The effluent was shown to be toxic. The permittee performed a Toxicity Reduction Evaluation which concluded the zinc was the cause of the toxicity. High concentrations of zinc in the discharge are permitted under the variance-based effluent limits. The facility is required to continue to address cadmium, lead and zinc in the effluent primarily through infiltration and inflows (I/I) reductions or treatment.

Screening for whole effluent toxicity is required under the proposed permit.

Receiving Water Testing

The permittee conducted receiving water monitoring as required by the permit. The permittee's receiving water monitoring data is shown in Appendix B. (page 42). This information was used to inform appropriate permit limits in the proposed permit.

Variance Reporting Requirements

The 2004 permit included a variance from the water quality standards and associated effluent limits for cadmium, lead and zinc. The permit also included specific Variance Requirements to demonstrate progress toward meeting the much lower water quality-based effluent limits. The permittee submitted annual reports and completed other milestones as required.

Best Management Practices (BMPs)

The permittee was required to incorporate specific BMPs into the Operations and Maintenance Plan by February 2005. This was done. The permittee should continue to identify and address BMPs to enhance and ensure compliance with effluent limitations.

Facility Planning

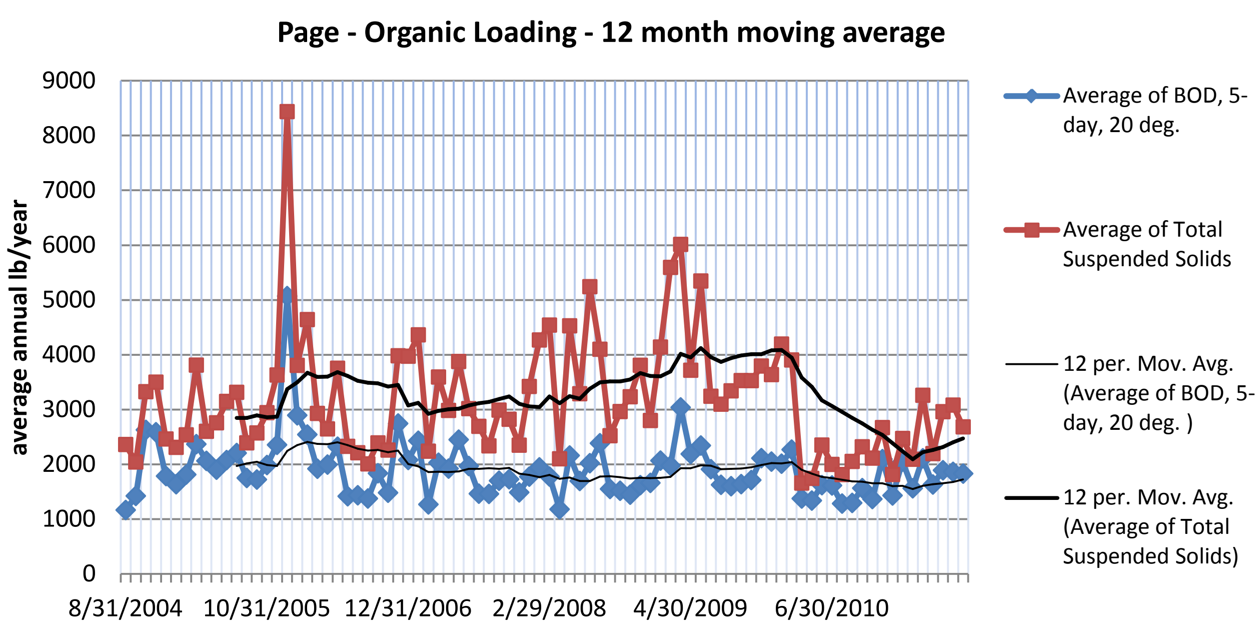
The permittee was required to begin facility planning when influent hydraulic or organic loading exceeded 85% of the design criteria on an average annual basis based on the previous twelve months of data. The planning and schedule for improvements was to begin within one year of first exceeding 85% of any of the design criteria. The design capacity is as follows.

Table 1. Design Capacity 2004 Permit

Criteria	Value	85% of Design	Units
Average Flow	4.3	3.7	mgd
Influent BOD_5 Loading	2,840	2,431	lbs/day
Influent TSS Loading	2,840	2,431	lbs/day

DMR data shows that the facility exceeded 85% of influent loading criterion for TSS early in the permit cycle. The following graph shows the calculated organic loading based on the DMR data for TSS concentration, BOD_5 concentration on a monthly average basis. For this analysis, the loading was calculated based on monthly average flow and concentration because loading on a monthly basis was not required to be submitted with the monthly DMRs. TSS loading was greater than the design criteria for much of the permit term. TSS has trended down to the level of 85% of the design criteria in the past couple of years.

Figure 3. Average Annual Organic Loading



The organic loading (both TSS and BOD_5) design criteria are low compared to typical municipal loading design standards. TSS and BOD_5 concentrations in typical municipal sewage are assumed to be approximately 200 mg/L TSS and BOD_5. In the case of Page, the design criteria would have assumed a concentration of approximately 80 mg/L [Concentration = mass load/(flow x conversion factor) = 2,840/(4.3 x 8.34)]. Sometimes low organic loading concentrations are used to account for known high levels of infiltration and inflows (I/I) into the conveyance system at the time of design. I/I dilutes influent sewage. The DMR data shows the average organic concentrations were 184 mg/L TSS and 110 mg/L BOD_5; therefore, actual influent concentrations are greater than were used in the design assumption.

The proposed permit requires the permittee to re-evaluate the capacity of the treatment process and, if possible, establish new design criteria based on the present influent characteristics, or begin planning to address new capacity.

III. Receiving Water

The facility discharges to the South Fork Coeur d'Alene River near the City of Smelterville. The facility performed receiving water monitoring throughout the permit cycle as required by the permit, as summarized in Appendix B. Appendix C (page 56) summarizes receiving water monitoring data available from the U.S. Geological Survey (USGS). Available information about the flow and quality of the receiving water were used to establish appropriate permit limits for the discharge.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the Idaho WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria.

The EPA uses a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate (30B3) to evaluate ammonia. This evaluation criterion aligns with the ammonia criteria being based on the 30-day average concentration not to be exceeded more than once every three years. The lowest 30-day average flow rate expected to occur once every ten years (30Q10) may be used for ammonia in cases where seasonal variation in flow is used. The Idaho WQS recommend the lowest 30-day average flow rate expected to occur once every five years (30Q5) flow rate for the human health criteria for non-carcinogens, and the harmonic mean flow rate for the human health criteria for carcinogens.

River flow data from the following three USGS monitoring stations were considered to evaluate critical flows. Figure 4 shows the locations of the monitoring stations in reference to the WWTP and Table 2 shows the critical design flows used as the basis for this permit.

The EPA determined critical design flows in the vicinity of the discharge based on stream flow data from the following U.S. Geological Survey (USGS) monitoring locations:

1. Upstream Site NR KELLOGG ID — USGS 12413210 SF COEUR D ALENE AT ELIZABETH PARK, Latitude 47° 31'53", Longitude 116° 05'33"

2. Upstream Site SMELTERVILLE ID — USGS 12413300 SF COEUR D ALENE RIVER AT, Latitude 47°32'54", Longitude 116°10'31"

3. Downstream Site: ID — USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST, Latitude 47°33'07", Longitude 116°14'11"

Figure 4. River Flow Monitoring Stations in the Vicinity of the Outfall

Data from the upstream Smelterville monitoring site was used as the basis for critical flow data for the 2004 permit. Monitoring data for this location spans seven years, from 1966 through 1974. According to the previous fact sheet, the 1Q10 and 7Q10 were set as the lowest flow observed during the time period. The lowest flow during the period was 64 cfs which occurred December 8, 1972. This flow was used for both the 1Q10 and 7Q10 flows as the basis for evaluating reasonable potential and for establishing permit limits. For the proposed permit, the flow data at Smelterville was not considered further because the data is relatively old and the duration too short to establishing critical flows.

River flow data from both Pinehurst and Elizabeth Park were evaluated to establish critical rivers flows for the proposed permit. Limited instantaneous river flow data collected between January 8, 2002 and October 16, 2008 at Smelterville was used to establish a correlation between flows at both the Elizabeth Park and the Pinehurst USGS monitoring stations. Flows at Smelterville were more highly correlated with flows at Elizabeth Park than with Pinehurst. Therefore, the Elizabeth Park gauge data was used to establish critical river flows in the vicinity of the discharge for this permit.

The Elizabeth Park monitoring location includes daily flow data beginning in 1987 through the present. The following graph shows the average monthly flows during the period from 1987 through 2011. The low flow period for establishing effluent limitations is July through December and the high flow period is January through June, refer to Appendix C (page 48), Figure 9.

The critical design flows at Elizabeth Park were calculated using the EPA's dFlow[1] program for flows at Elizabeth Park using approximately 24 years of daily flow data.

Table 2. Critical Design Flows – South Fork Coeur d'Alene River at Elizabeth Park

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	40.4	**46.8**	**42.2**
7Q10	51	**58.8**	**52.4**
30Q10	57.1	**71.9**	**56.6**
30Q5	59.3	**91.4**	**61.1**
Harmonic Mean	143	**143**	**141**

A correlation between the daily river flow data at Elizabeth Park and the limited instantaneous flow data at the Smelterville gauge was established using the Excel® workbook based on an established statistical method, refer to Appendix C: River Critical Design Flows.[2] The Smelterville river flow data is presented in Appendix C. The correlation was used to estimate the critical river flows in the vicinity of the discharge (page 48).

Table 3. Critical Design Flows – SF Coeur d'Alene River Estimate at Smelterville

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	41.5	**48.2**	**43.3**
7Q10	52.6	**60.8**	**54.0**
30Q10	59.0	**74.6**	**58.4**
30Q5	61.3	**95.2**	**63.2**
Harmonic Mean	150.2	**150.2**	**148.1**

B. Water Quality Standards

Overview

Section 301(b)(1)(C) of the 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, narrative and numeric 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 narrative and numeric water quality criteria are the criteria deemed necessary by the state to support

[1] Water Quality Models and Tools – DFLOW (http://water.epa.gov/scitech/datait/models/dflow/index.cfm)

[2] Hirsch, R. A Comparison of Four Stream flow Record Extension Techniques. Water Resources Research. Vol. 18, No. 4, Pages 1081-1088. August 1982.

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 the South Fork Coeur d'Alene River in the South Fork Coeur d'Alene River subbasin (USGS HUC 17010302). At the point of discharge, the South Fork Coeur d'Alene River is protected for the following designated uses as specified in IDAPA 58.01.02.150.10:

- COLD - Cold Water Communities
- SCR – Secondary Contact Recreation

In addition, the Water Quality Standards (WQS) state that all waters of the State of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c.), wildlife habitats (100.04) and aesthetics (100.05). The WQS state in Sections 252.02, 252.03 and 253 that these uses are to be protected by general criteria (sometimes referred to as narrative criteria) which are stated in Section 200. The WQS also state, in Section 252.02 that the criteria from Water Quality Criteria 1972, also referred to as the "Blue Book" (EPA-R3-73-033), can be used to determine numeric criteria for the protection of the agricultural water supply use.

Surface Water Quality Criteria

The WQS establish both general and numeric surface water quality criteria that apply to all surface waters.

The general criteria (IDAPA 58.01.02.200) state that all surface waters of the state shall be free from:

- hazardous materials,
- toxic substances,
- deleterious materials,
- radioactive materials,
- floating, suspended or submerged matter,
- excess nutrients,
- oxygen-demanding materials

Surface water level shall not exceed allowable level for:

- radioactive materials, or
- sediments

If the natural background conditions exceed any criteria then the applicable criteria does not apply, but rather, there shall be no lowering of water quality from the natural background condition.

The WQS establish numeric criteria (IDAPA 58.01.02.210) that apply to waters designated for aquatic life, recreation and domestic water supply. The numeric criteria establish the maximum concentration of a pollutant that can be present surface waters.

The WQS establish additional surface water criteria to protect aquatic life uses (IDAPA 58.01.02.250). These include pH and total concentration of dissolved gasses that apply to all aquatic life designations and dissolved oxygen, temperature. ammonia, and turbidity which have unique criteria depending on the beneficial use designations of cold water, salmonid spawning, seasonal cold water or warm water.

The WQS establish surface water quality criteria for recreational use designation (IDAPA 58.01.02.251). Waters designated for recreation are not to contain *E. coli* bacteria in concentrations that exceed the established criterion as prescribed for secondary contact recreation. The following table summarized the applicable water quality criteria and outline how the permit ensures that the permitted discharge will not cause or contribute to non-attainment of the applicable criteria in the water body.

Table 4. Summary of Applicable Water Quality Criteria

Criteria for Water body	How the Criteria was evaluated…
General Criteria (IDAPA 58.01.02.200) Surface waters of the state shall be free from: • hazardous materials, • toxic substances, • deleterious materials, • radioactive materials, • floating, suspended or submerged matter, • excess nutrients, • oxygen-demanding materials Surface water level shall not exceed allowable level for: • radioactive materials, or • sediments	The treatment process utilizes secondary (biological) treatment using lagoons. This level of treatment ensures that the effluent will not contribute to violations of the general criteria. Sewer ordinances prohibit the discharge of many of these pollutants into the sanitary sewer system. Priority pollutant monitoring and whole effluent toxicity testing are required to evaluate the presence of toxic substances and determine if the effluent is toxic to organisms.

<table>
<tr><th>Criteria for Water body</th><th>How the Criteria was evaluated…</th></tr>
<tr><td>Numeric Criteria for Toxics (IDAPA 58.01.02.210)

The WQS contain a listing of pollutants for which numeric criteria have been established. Extensive monitoring of the effluent throughout the permit cycle has shown that the following toxic pollutants have been present in at detectable levels in the effluent.
• Ammonia
• Cadmium
• Chlorine (Total Residual)
• Copper
• Lead
• Zinc</td><td>Refer to Appendix D for the numeric criteria used to evaluate the reasonable potential for the effluent to cause or contribute violations of the WQS for both low and high river flow conditions.

The reasonable potential analysis shows that ammonia, chlorine, cadmium, lead and zinc have a reasonable potential to contribute to violations of the aquatic life criteria. Effluent limitations are required and were calculated for these parameters.

A seasonal effluent limit was established for ammonia during the low flow period based on 50% of critical river flows based on the adjacent mixing zone with the Smelterville WWTP. There is no reasonable potential during the high flow period, therefore, no limit is required during the high flow period.

Seasonal water quality-based limits were calculated for total residual chlorine based on authorization of 50% of critical river flows based on the adjacent mixing zone with the Smelterville WWTP. However, the low flow limits were imposed year around to simplify the permit adminstration. The limits for the high flow and low flow permits were nearly the same.

The metals criteria are a function of hardness, which vary for low and high river flow conditions and the mixture of the effluent and receiving water.

Per Idaho's Water Quality Standards at IDAPA 58.01.02.210.03.c.ii: "The hardness values used for calculating aquatic life criteria for metals at design discharge conditions shall be representative of the ambient hardnesses for a receiving water that occur at the design discharge conditions given in Subsection 210.03.b." The reference to 210.03.b provides the 1Q10/1B3 and 7Q10/4B3 design conditions for aquatic life criteria.

Variance-based, interim and final WQBELs were established for cadmium, lead and zinc. There limits were calculated assuming that no mixing zone would be authorized because the receiving water exceeds the criteria for these pollutants.

Refer to Appendix D for the evaluation of the reasonable potential for the effluent to cause or contribute to violation of the WQS for critical river flow conditions.</td></tr>
</table>

Criteria for Water body	How the Criteria was evaluated…
Surface Water Criteria To Protect Aquatic Life Uses (IDAPA 58.01.02.250) pH – Range 6.5-9.0 Total Dissolved Gas – <110% saturation at atm. pressure. **Cold Water** Dissolved Oxygen – 6 mg/L Temperature – Cold Water, 22ºC instantaneous max. 19ºC max daily average. Ammonia – refer to appendix C, temperature and pH dependent Turbidity – 50 NTU, but no more than 25 NTU for more than 10 days.	pH – The permit includes end-of-pipe effluent limits for pH based on the potential of the effluent to contribute to violations of the criteria. Appendix D includes an analysis that considers worst case effluent and receiving water conditions to determine if there is a reasonable potential for the discharge to contribute to violations of the WQS. The technology-based limits of pH 6.0 to 9.0 may contribute to violations at the low end of the range. This analysis shows that there is no reasonable potential for the discharge to cause the receiving water to above or below the WQS if pH is limited to a range of 6.5 to 9.0 s.u. Total Dissolved Gas – The effluent is not expected to contain dissolved gases. No further evaluation was done. Dissolved Oxygen - Based on the ratio of mixing of the effluent in the receiving water, the effluent does not have a reasonable potential to contribute to violations of the WQS for dissolved oxygen. The Streeter-Phelps equation was used to evaluate DO. The DO is not predicted to go below the water quality criteria based on limited available input data. Temperature – The effect of the effluent on the receiving water temperature was evaluated in very general terms in appendix D. The data set lacked daily temperature data needed to make a determination of reasonable potential. Additional monitoring for temperature in the receiving water and effluent is required to better characterize the seasonal variation of the temperature of the effluent and receiving water. This information is needed to better evaluate during which time of the year the effluent may contribute to violations of the WQS. Ammonia – There is a reasonable potential to contribute to excusions of the WQS for ammonia. Seasonal water quality-based effluent limits were established to ensure that the effluent does not contribute to violations of the ammonia criteria. Turbidity – No turbidity data was collected for the effluent. The technology-based limit for TSS of 30 mg/L is presumed to be protective. Refer to Appendix D for the evaluation of the reasonable potential for the effluent to cause or contribute to violation of the WQS for critical river flow conditions.

Criteria for Water body	How the Criteria was evaluated…
Surface Water Quality Criteria For Recreational Use Designation (IDAPA 58.01.02.251) **Secondary Recreation** E. Coli – 126 organisms per 100 ml on a minimum of 5 samples taken every 3 to 7 days in a 30 day period. 576 organisms per 100 ml a single sample maximum is not alone a violation but indicates a likely exceedance of the geometric mean criterion.	The permit applies end-of-pipe limitations for *E. coli*, therefore, the discharge will not contribute to non-attainment of the criteria.

Water Quality Impairments in the Receiving Water

The IDEQ has identified the following water quality impairments.

Table 5. Causes of Impairment for Reporting Year 2010

Cause of Impairment	Cause of Impairment Group	State TMDL Development Status
Cadmium	Metals (other than Mercury)	TMDL needed
Lead	Metals (other than Mercury)	TMDL needed
Sedimentation/Siltation	Sediment	TMDL completed
Zinc	Metals (other than Mercury)	TMDL needed
Temperature		TMDL needed

IDEQ completed the *South Fork Coeur d'Alene River Sediment Subbasin Assessment and Total Maximum Daily Load* in May 2002[3]. The EPA approved the TMDL in August 2003. The TMDL assigned a wasteload allocation of 115 tons per year (equivalent to 630 lbs/day) of total suspended solids (TSS) for discharged from the Page WWTP. Refer to Appendix D, Section H for development of effluent limitations based on the TMDL allocation.

Variance to Water Quality Standards

The IDEQ issued a document titled *Variance from Idaho Water Quality Aquatic Life Criteria for Cadmium, Lead and Zinc*[4] on June 5, 2009. The EPA approved the variance on July 22, 2009. The variance became effective on July 30, 2009 and expires on July 30, 2014. The variance established the applicable permit limits for cadmium, lead and zinc while the variance is in effect. The following table shows the permit limits established under the variance. The variance establishes limits for discharge flows less than 4.3 mgd and greater than 4.3 mgd. The limits are slightly higher for cadmium and lead at the higher flows. The limits are identical for the two flows for zinc.

[3] http://www.deq.idaho.gov/water-quality/surface-water/tmdls/table-of-sbas-tmdls/coeur-d'alene-river-south-fork-subbasin.aspx
[4] http://www.deq.idaho.gov/water-quality/surface-water/standards/variances.aspx

Table 6. Variance-based Limits for Cadmium, Lead and Zinc

Limits at discharge flows ≤ 4.3 mgd

Parameter	Maximum Daily Limitation		Average Monthly Limitation	
	µg/L	Lbs/day	µg/L	Lbs/day
Cadmium, Total Recoverable	8.3	0.30	5.3	0.19
Lead, Total Recoverable	96	3.4	63	2.2
Zinc, Total Recoverable	1340	48	802	29

Limits at discharge flows > 4.3 mgd

Parameter	Maximum Daily Limitation		Average Monthly Limitation	
	µg/L	Lbs/day	µg/L	Lbs/day
Cadmium, Total Recoverable	8.8	0.32	5.3	0.19
Lead, Total Recoverable	182	6.5	84	3.0
Zinc, Total Recoverable	1340	48	802	29

The proposed permit will impose the limits for less than 4.3 mgd at all times to simplify permit implementation. The rationale for maintaining a single set of variance-based limits is as follows: The high flow limit for maximum daily cadmium and lead are only slightly higher than the low flows. Based on historic performance, the facility does not need the higher flow-based limit to remain in compliance.

The draft permit includes water-quality based effluent limits (WQBELs) for cadmium, lead and zinc. The permittee will have to make significant modifications to the WWTP at significant cost to meet the WQBELs. Therefore, the proposed permit includes a compliance schedule to allow time to make the necessary upgrades. If the IDEQ chooses to extend or re-issue a variance beyond the July 30, 2014 deadline, the permit would need to be modified in order to incorporate the re-issued variance.

Site Specific Criteria

Site-specific water quality criteria (SSC) that reflect local environmental conditions are allowed by federal and state regulations. 40 CFR § 131.11 provides states with the opportunity to adopt water quality criteria that are "…modified to reflect site specific conditions."[5] SSC were adopted for cadmium, lead and zinc by IDEQ in the Water Quality Standards and approved by the EPA. The following equations were used to calculate the numeric criteria for these pollutants, refer to Appendix D (page 66).

[5] Development of Site-Specific Water Quality Criteria for the South Fork Coeur d'Alene River, Idaho, Application Of Site-Specific Water Quality Criteria Developed In Headwater Reaches To Downstream Waters. Idaho Department of Environmental Quality, December 13, 2002, (http://www.deq.idaho.gov/media/445306-sfcda_criteria_downstream.pdf)

Table 7. Site Specific Criteria Equations for Cadmium, Lead and Zinc

Parameter	CMC (µg/L)	CCC (µg/L)
Cadmium	exp[1.0166 x ln(hardness)-3.924]	[1.101672-(ln(hardness) x 0.041838] x exp[(0.7852*LN(hardness)-3.49]
Lead	exp[0.9402 x ln(hardness)+1.1834]	exp[0.9402 x ln(hardness)-0.9875]
Zinc	exp[0.6624 x ln(hardness)+2.2235]	exp[0.6624 x ln(hardness)+2.2235]

Antidegradation

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations 40 CFR §§ 122.4(d) and 122.44(d) to establish conditions in NPDES permits that ensure compliance with State water quality standards, including antidegradation requirements.

The IDEQ integrates antidegradation review into the 401 certification process. The IDEQ provided the EPA with an antidegradation analysis as part of their draft 401 certification for the draft permit, refer to Appendix H.

IV. Effluent Limitations

A. Basis for Effluent Limitations

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 water body are being met and may be more stringent than technology-based effluent limits. The technical basis for the effluent limitations established for the permit are discussed in Appendix D.

B. Proposed Effluent Limitations

Below are 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 amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses of the receiving water.
2. Removal requirements for biochemical oxygen demand (BOD_5) and total suspended solids (TSS): The monthly average effluent concentration must not exceed 35 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 concentrations and the arithmetic mean of the effluent concentrations for that month. Influent and effluent samples must be taken over approximately the same time period as a flow-proportional 24-hour composite sample.

The table below presents the proposed average monthly, average weekly, maximum daily, minimum daily and other effluent limits that apply. Refer to Appendix D for the derivation for effluent limits.

Table 8. Basis for Proposed Effluent Limits

Parameter	Effluent Limitations				Basis for Limit
	Units	Average Monthly	Average Weekly	Maximum Daily[2]	
Numeric Effluent Limits					
Biochemical Oxygen Demand (BOD_5)	mg/L	**30**	**45**	**—**	Both the concentration and mass limits are technology-based. Percent removal is technology-based for treatment equivalent to secondary.
	lb/day	**1,100**	**1,600**	**—**	
	% removal	**65% min.**	**—**	**—**	
Total Suspended Solids (TSS) *TMDL-based limit*	mg/L	**30**	**45**	**—**	The mass limit is based on the TMDL (refer to section III.B). The average weekly limit was calculated by multiplying the monthly limit by a multiplier of 2.01. The concentration limits are technology-based.
	lb/day	**630**	**1,160**	**—**	
	% removal	**65% min.**	**—**	**—**	
E. Coli Bacteria[1]	#/100 ml	**126 (geometric mean)**	**—**	**576**	Water-quality based, no mixing zone authorized.
pH	s.u.	**Daily minimum 6.5 Daily maximum 9.0**			Water-quality based, no mixing zone authorized.
Total Residual Chlorine *based on low flow dilution*	µg/L	**29**		**73**	Water-quality based limit with mixing zone authorized at 50% based on the shared mixing zone. The limits for the low flow condition will apply year around since season limits are nearly the same, refer to appendix D.
	lb/day	**1.0**		**2.6**	
Total Ammonia (as N) *High Flow Period (December – May)*	mg/L	**—**	**—**	**—**	There is no reasonable potential to contribute to violations of the WQ criteria for ammonia during the high flow period. Monitoring is required.
	lb/day	**—**	**—**	**—**	
Total Ammonia (as N) *Low Flow Period (June - November)*	mg/L	**13.3**	**—**	**34.8**	There is a reasonable potential to contribute to violations of the WQ criteria for ammonia during the low flow period. A limit was established based on the authorization of a mixing zone (50% based on shared mixing zone with Smelterville) and resulting dilution at critical river flows, refer to Appendix D.
	lb/day	**476**	**—**	**1,250**	
Numeric Effluent Limits under Variance - Effective until midnight July 30, 2014					
Cadmium	µg/L	**5.3**	**—**	**8.3**	Limit was established by a variance issued by IDEQ and approved by EPA.
	lb/day	**0.19**	**—**	**0.30**	
Lead	µg/L	**63**	**—**	**96**	

Parameter	Effluent Limitations				Basis for Limit
	Units	Average Monthly	Average Weekly	Maximum Daily[2]	
	lb/day	**2.2**	**—**	**3.4**	
Zinc	µg/L	**800**	**—**	**1,340**	
	lb/day	**29**	**—**	**48**	
Interim Numeric Effluent Limits under Compliance Schedule Effective July 31, 2014 through December 31, 2034					
Cadmium	µg/L	**4.6**	**—**	**7.2**	Performance-based limits for concentration were calculated using the same methodology as used to calculate the 2004 and 2009 variances. The full data set from 2004-2011 was used to calculate the proposed performance-based limits, refer to page 81 Mass limits were based on design flow. Refer to Appendix D.
	lb/day	**0.16**	**—**	**0.26**	
Lead	µg/L	**54**	**—**	**82**	
	lb/day	**1.9**	**—**	**2.9**	
Zinc	µg/L	**800**	**—**	**1,340**	
	lb/day	**29**	**—**	**48**	
Final Numeric Effluent Limits – Water Quality-Based – Effective as noted below					
Cadmium *Effective* ***December 31, 2035***	µg/L	**0.73**	—	**1.7**	Water-quality based, no mixing zone authorized, refer to Appendix D for the calculation.
	lb/day	**0.026**	—	**0.060**	
Lead *Effective* ***December 31, 2035***	µg/L	**18**	—	**39**	
	lb/day	**0.65**	—	**1.4**	
Zinc *Effective* ***December 31, 2035***	µg/L	**107**	—	**168**	
	lb/day	**3.8**	—	**6.0**	

The following footnotes reference the permit.

1. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml. See Part VI for a definition of geometric mean.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See I.B.2. and III.G.

   The limits for total residual chlorine are not quantifiable using EPA approved analytical methods. The Minimum Level (ML) for chlorine is 50 µg/L. When the daily maximum and average monthly effluent concentration is below the ML, EPA will consider the permittee in compliance with the total residual chlorine limitations.
3. Refer to I.C.
4. See NPDES Permit Application Form 2A, Part D for the list of pollutants to include in this testing. Testing is required quarterly during the year 2013 and results submitted with DMRs for the 1st month of each quarter (April, July, October and January). Additionally, the expanded effluent testing must occur on the same day as a whole effluent toxicity test and must be submitted with the WET test results as well as with the next permit application.
5. The monthly average percent removal must be calculated from the arithmetic mean of the influent concentration values and the arithmetic mean of the effluent concentration values for that month. Influent and effluent samples must be taken over approximately the same time period.

C. Basis for Less Stringent Effluent Limits (Anti-backsliding)

Clean Water Act Section 402(o)(3) Requirements

Section 402(o) of the CWA generally prohibits the establishment of effluent limits in a reissued NPDES permit that are less stringent than the corresponding limits in the previous permit (i.e. "backsliding") but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. water quality-based limits or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on technology-based effluent limits established using best professional judgment (i.e. based on Section 402(a)(1)(B)).

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) 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). The Clean Water Act at Section 402(o)(2) sets forth some exceptions to the prohibition against backsliding from effluent limitations provided the revised effluent limitation does not result in a violation of applicable water quality standards, including antidegradation requirements.

Ammonia Limits – Apply Seasonal Limit, Low Flow

The proposed permit changes the structure of the ammonia effluent limitations from a single year around limit in the current permit to a seasonally-based limit. Additionally, the proposed permit limits the combine load of ammonia discharged from the Page and Smelterville WWTPs because these facilities have adjacent outfalls. The combined load reduction is 197 lbs/day on a monthly average basis as discuss in Appendix D (page 79).

Even though the limits for Page and Smelterville, in combination reduce the permitted load, the concentration and mass limits for Page are less stringent in the proposed permit. The following factors were considered in determining the appropriateness of seasonal-based limits.

1. The availability and use of more extensive flow data for the South Fork Coeur d'Alene River near the point of discharge, than were used in the current permit, allowed for the determination of seasonally-based critical flows. Idaho's WQS require that the potential for a discharge to contribute to violations of the criteria be evaluated under critical flow conditions.
2. The application of seasonally-based limits for ammonia more accurately represents the seasonal variation in river flow and the toxic effects of ammonia in the water body.

The reasonable potential analysis for seasonal flow found no reasonable potential to exceed the WQS during the high flow period in the winter months. Therefore, the proposed permit eliminates ammonia limits during the high flow period.

Several changes and corrections were made to the methodology for calculating the ammonia limits. Individually, some of the calculation changes would result in lower limits and some of the changes would result in higher limits. Overall, it was determined that the limits should be calculated based on the current guidance, policies and available data. The following factors influenced the calculation of the proposed effluent limits:

- The propose permit recognized the shared mixing zone for the Page and Smelterville WWTPs. IDEQ's WQS allow for 50% of the stream width for adjunct mixing zones.
- The combined load will be shared between the Page and Smelterville WWTPs. The load can be apportioned based design flow or some other combination such that the sum of the mass load limitations is not exceeded. In the proposed permit, the Smelterville WWTP has been allotted approximately 5% additional load above what would be allotted based on their design criteria alone. Consequently, the Page WWTP has been allocated less ammonia loading than could be allocated based on their design flow. This allotment allows both facilities to have effluent limits achievable with their current WWTPs technology. Refer the discussion and calculations in Appendix D (page 79).

Table 9. Comparison of WQ-based Limits for Ammonia

Parameter	Effluent Limitations				
	Units	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
		Proposed Permit		Current Permit	
Total Ammonia as N *High Flow Period - (December – May)*	mg/L	**No Limit Required**	**No Limit Required**	12.4	21.2
	lb/day	**No Limit Required**	**No Limit Required**	445	760
Total Ammonia as N *Low Flow Period -(June-November)*	mg/L	**13.3**	**34.8**	12.4	21.2
	lb/day	**476**	**1,250**	445	760

The South Fork of the Coeur d'Alene meets water quality standards for ammonia, a water quality-based effluent limit may be relaxed where the action is consistent with the state's antidegradation policy. As provided in IDEQ's antidegradation review, this revision derives from and complies with the state's new water quality criteria; elimination of the winter limits is consistent with the state's antidegradtion policy. Thus the change is consistent with 303(d)(4), and is therefore allowed under 402(d)(1).

Cadmium, Lead and Zinc Limits –Slight Increase

The water quality-based permit limits for cadmium, lead, and zinc slightly increased in the proposed permit. The methodology for calculating the water quality-based limits for cadmium, lead and zinc was changed from the current permit to be consistent with the TSD. (Section 5.5.3 of the TSD, recommends to use an assumed number of samples "n" of at least four to derive the AML even when the compliance monitoring frequency is less than four samples per month when the chronic long term average is used to calculate limits.). In addition, a higher receiving water hardness was used to calculate the appropriate site specific criteria. The hardness was based on additional analytical data collected under the 2004 permit, refer to Appendix D (page 63). The following table provides a comparison the WQBELs for metals.

Table 10. Comparison of WQ-based Limits for Cadmium, Lead and Zinc

Parameter	Effluent Limitations				
	Units	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
		Proposed Permit		Current Permit	
Cadmium	µg/L	0.73	**1.7**	0.79	1.1
	lb/day	0.026	**0.060**	0.028	0.039
Lead	µg/L	**18**	**39**	15.0	33
	lb/day	**0.65**	**1.4**	0.53	1.2
Zinc	µg/L	**107**	**168**	88.0	133
	lb/day	**3.8**	**6.0**	3.2	4.8

The final permit limits for cadmium, lead and zinc in the current permit were not put into effect because the two consective variances for cadmium, lead and zinc. Therefore, the proposed less stringent limits are not subject to anti-backsliding.

Copper Limit – Removed

The determination of reasonable potential in the previous permit was based on only nine samples and a resulting reasonable potential multiplier of 3.2. This significantly overestimated the reasonable potential to contribute to violations of the standard. In addition, the previous permit did not include the detailed information used to calculate the copper limits such as the assumed coefficient of variation. Therefore, it is not possible to validate the basis for the current permit limit.

The data collected during the permit cycle (2004-2011) allowed for a more accurate determination of the reasonable potential. A total of 84 analytical results for copper collected during the permit cycle. The highest sample result was 21.7 µg/L (December 2006). The 95^{th} percentile of the values was 13.7 µg/L with a coefficient of variation of 0.39. The calculation of reasonable potential presented in Appendix D show that there is no reasonable potential for copper. This proposed permit removes the permit limit for copper but the permittee is required to continue screening for copper along with other priority pollutants.

Table 11. Comparison of WQ-based Limits for Copper

Parameter	Effluent Limitations				
	Units	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
		Proposed Permit		Current Permit	
Copper	µg/L	**No Limit Required**	**No Limit Required**	20	29
	lb/day	**No Limit Required**	**No Limit Required**	0.72	1.04

The removal of the copper limit complies with the anti-backsliding provisions of the CWA section 402(o)(3) because there was new information available to more accurately evaluate the reasonable potential for copper. The proposed limits meet the requirements of Tier I antidegration because the limits are water quality-based to ensure beneficial uses are maintained.

V. Compliance Schedule

A. Legal Basis

The Idaho Water Quality Standards at IDAPA 58.01.02.400.03 allows for compliance schedules "which allow a discharger to phase in, over time, compliance with water quality based effluent limitations when new limitations are in the permit for the first time".

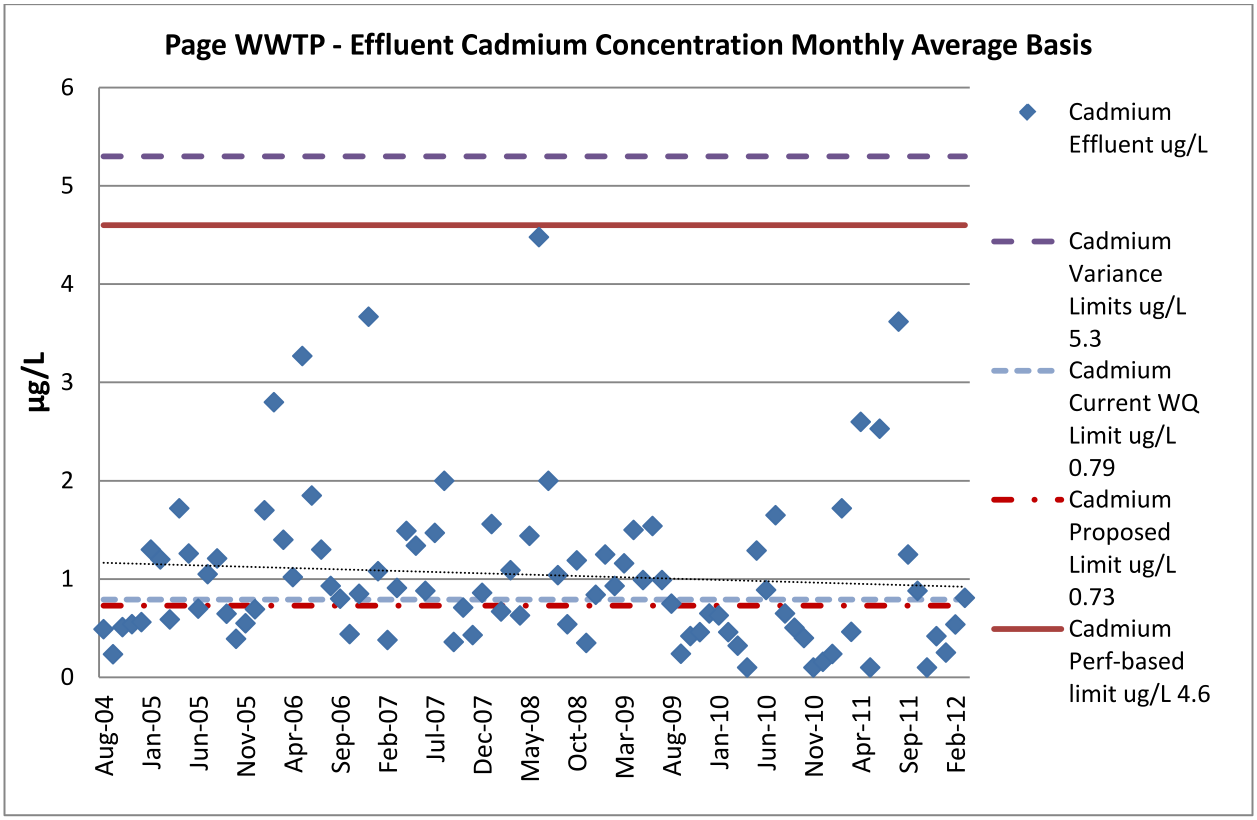
The federal regulation at 40 CFR §122.47 requires that any compliance schedule achieve compliance as soon as possible. Furthermore, if a permit establishes a compliance schedule which exceeds one year from the date of permit issuance, the schedule must set forth interim requirements and the dates for their achievement. The time between the interim dates must generally not exceed one year. If the time necessary for completion of any interim requirement is more than one year (such as construction of a control facility), the schedule must specify interim dates for the submission of reports of progress toward completion of the interim requirements and indicate a projected completion date. The regulation requires that the permit be written to require that no later than 14 days following each interim date and final date of compliance, the permittee must notify the EPA in writing of its compliance or non-compliance with the interim or final requirements, or submit progress reports as stated.

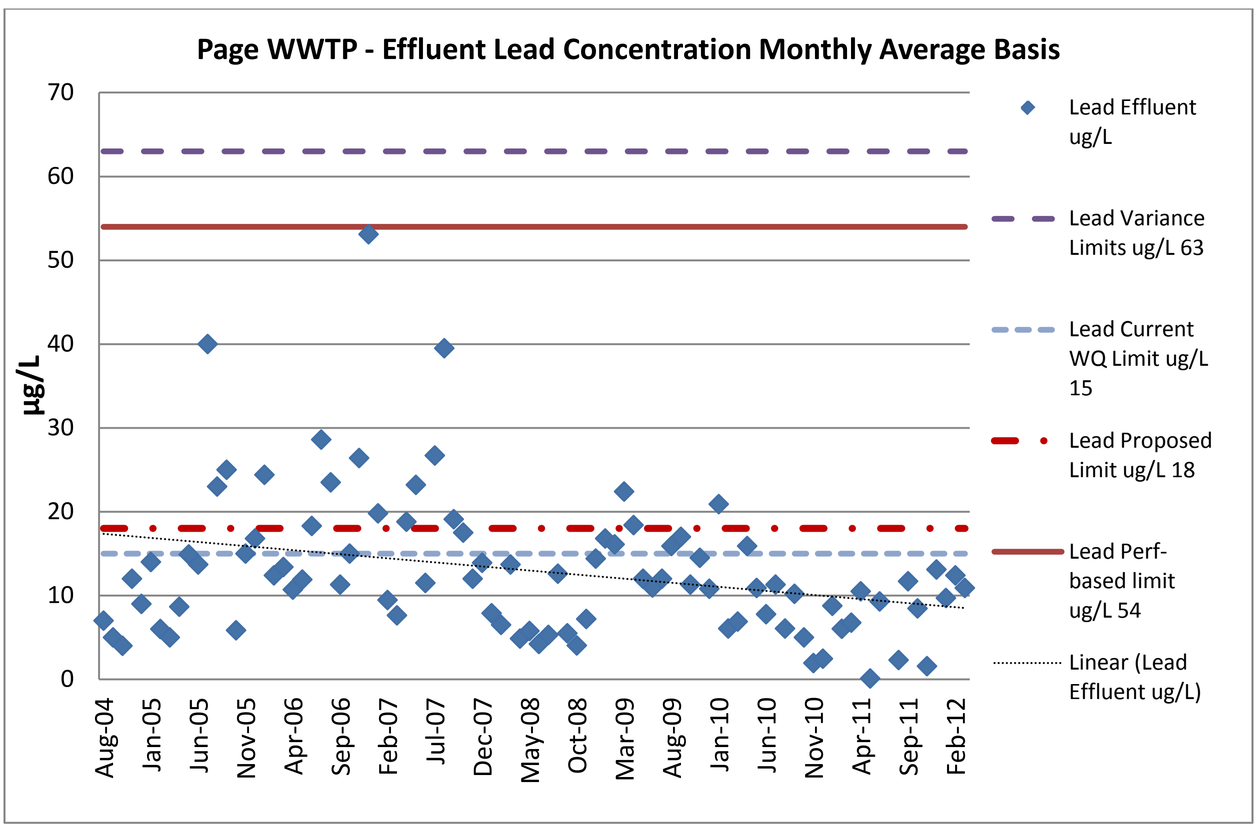
In order to grant a compliance schedule, the permitting authority must make a reasonable finding that the discharger cannot immediately comply with the water quality based effluent limit upon the effective date of the permit and that a compliance schedule is appropriate.

B. Compliance Schedule Justification

The permittee will be unable to meet the proposed water quality-based effluent limits for cadmium, lead and zinc upon expiration of the variance.

The following graphs show the concentration of cadmium, lead and zinc in the effluent under the current permit as compared to the proposed permit limits. The concentrations of these metals remained at a relatively constant level throughout the time period presented.


Page WWTP - Effluent Cadmium Concentration Monthly Average Basis
µg/L
6
5
4
3
2
1
0
Aug-04
Jan-05
Jun-05
Nov-05
Apr-06
Sep-06
Feb-07
Jul-07
Dec-07
May-08
Oct-08
Mar-09
Aug-09
Jan-10
Jun-10
Nov-10
Apr-11
Sep-11
Feb-12
Cadmium Effluent ug/L
Cadmium Variance Limits ug/L 5.3
Cadmium Current WQ Limit ug/L 0.79
Cadmium Proposed Limit ug/L 0.73
Cadmium Perf-based limit ug/L 4.6


Page WWTP - Effluent Lead Concentration Monthly Average Basis
µg/L
70
60
50
40
30
20
10
0
Aug-04
Jan-05
Jun-05
Nov-05
Apr-06
Sep-06
Feb-07
Jul-07
Dec-07
May-08
Oct-08
Mar-09
Aug-09
Jan-10
Jun-10
Nov-10
Apr-11
Sep-11
Feb-12
Lead Effluent ug/L
Lead Variance Limits ug/L 63
Lead Current WQ Limit ug/L 15
Lead Proposed Limit ug/L 18
Lead Perf-based limit ug/L 54
Linear (Lead Effluent ug/L)

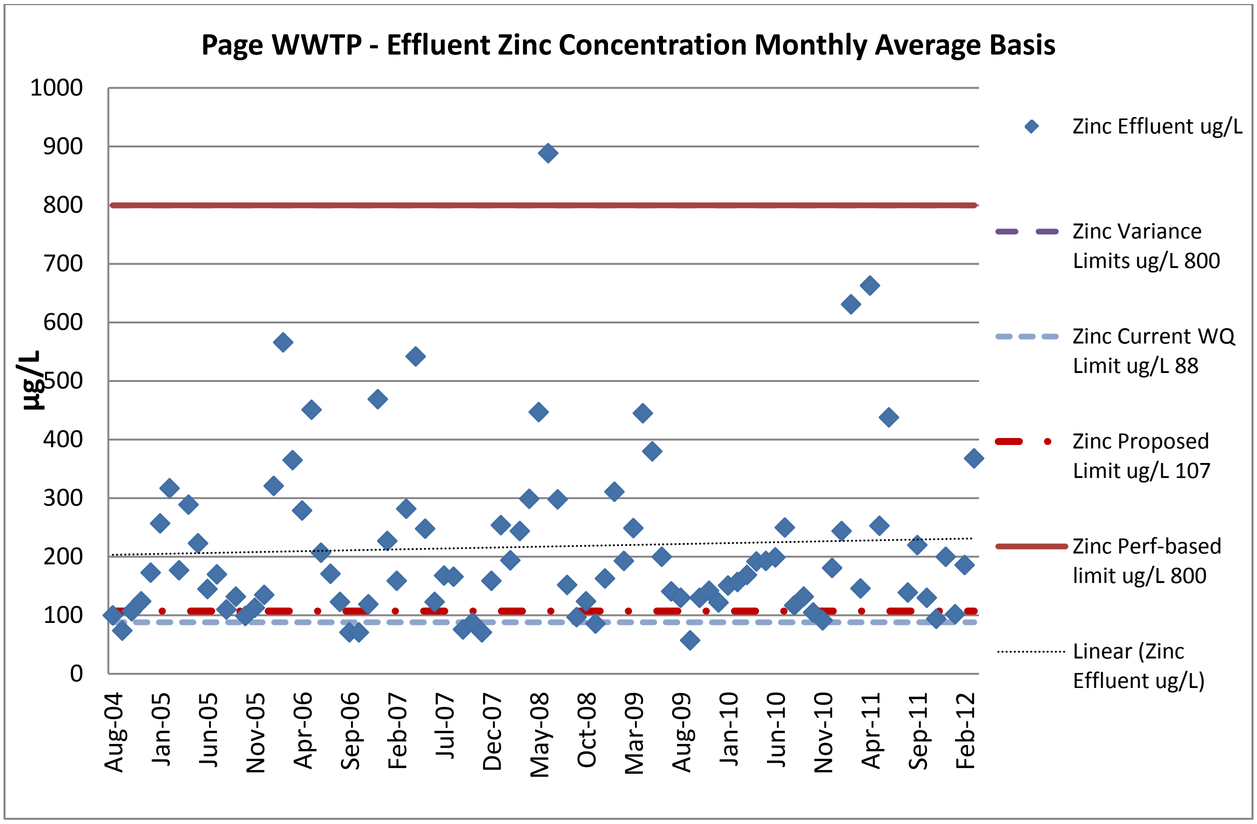


Figure 5. WWTP Historic Effluent Cadmium, Lead and Zinc and Limits

Much of the source of cadmium, lead and zinc in the effluent is due to I/I of metals-laden groundwater into the collection system. I/I must be addressed throughout the extensive collection system as the primary means of source control to limit the intrusion of groundwater. In establishing the compliance schedule, both the IDEQ and the EPA recognizes the importance of addressing I/I before embarking on costly process modifications and WWTP upgrades.

In proposing a compliance schedule, the EPA recognized the site-specific constraints related to the Superfund site. The length of the compliance schedule is set to align with the Bunker Hill Superfund remediation project. The duration of the remediation activities estimated to be 20 to 30 years. It is expected that the remediation efforts along with natural annenuation will reduce the concentrations of metals in the groundwater over the next 90 years.

The proposed permit allows for 20 years for the permittee to plan, design and construct a treatment system for metals. The EPA determined that 20-years would be the soonest that the facility could fund and construct projects related to both I/I reduction and WWTP upgrade.

The following proposed compliance schedule is based on Idaho DEQ's determination regarding the soonest possible time that compliance with the WQBELs could be achieved. The compliance schedule aims to achieve completion of construction of the necessary treatment process modifications to meet the limits within a 20-year period that begins after the expiration of the variance. The proposed permit requires both submission of written notification of completed tasks within 14 days and annual progress reports.

C. Compliance Schedule – Cadmium, Lead and Zinc

1. The permittee must achieve compliance with the cadmium, lead and zinc effluent limitations of Part I.A.1. (Table 1) of the permit, by December 31, 2034.
2. Until compliance with the cadmium, lead and zinc effluent limitations is achieved, at a minimum, the permittee must complete the tasks and reports listed in the Table 12.

Table 12. Tasks Required Under the Schedule of Compliance

Task No.	Due By	Task Description
1	**December 31, 2015**	**I/I Reduction Study** The permittee must complete the I/I Reduction Study to identify and prioritize I/I reduction projects, and serve as justification to appropriate funding. The study must establish a schedule to address I/I projects. The permittee should collaborate with satellite entities to produce a comprehensive study. Deliverable: The permittee must provide the I/I Reduction Study to the IDEQ for review and approval, and submit a copy to the EPA.
2	**June 30, 2016**	**Facility Planning** The permittee must develop a facility plan that evaluates the options that would allow the facility to meet the final water quality-based effluent limitations for cadmium, lead and zinc, and select a preferred alternative. The plan may include a combination of I/I reduction projects and WWTP upgrades. Deliverable: The permittee must provide the facility plan to the IDEQ for review and the necessary approvals and submit a copy to the EPA.
3	**December 31, 2016 and annually through December 31, 2029**	**Progress Report to Address I/I** The permittee must indicate progress toward removing I/I within the collection system and develop firm commitments with all satellite entities to implement I/I reduction projects. Deliverable: The permittee must submit a progress report to the EPA and the IDEQ on an annual basis. The report must discuss progress of the past year, projects implemented and the cost of sewer rehabilitation projects and proposed projects for the next year for the entire collection system including applicable satellite communities.

Task No.	Due By	Task Description
4[a]	**December 31, 2031**	**Treatment System Design** The permittee must complete design of the selected alternative for meeting the cadmium, lead and zinc effluent limitations. (The permittee may engage in renewed facility planning efforts to identify any new technologies for metals treatment. Another alternative may be implemented upon IDEQ approval. Planning must be done with respect to the design deadline without extending the design phase.) Deliverable: The permittee must provide written notification to the EPA and the IDEQ that the final design is complete.
5[a]	**December 31, 2031**	**Award Bid for Construction** The permittee must complete the awarding of the bid for construction of the project to meet the cadmium, lead and zinc effluent limitations. Deliverable: The permittee must provide written notification the EPA and the IDEQ that the bid award is complete.
6[a]	**December 31, 2032**	**Annual Report of Progress on Construction** Deliverable: The permittee must provide a report on the progress of construction.
7[a]	**December 31, 2033**	**Construction Complete** The permittee must complete construction to achieve the final water quality-based effluent limitations for cadmium, lead and zinc. Deliverable: The permittee must submit construction completion reports to the EPA and the IDEQ.
8	**December 31, 2034**	**Meet WQ-based Effluent Limitation for Cadmium, Lead and Zinc** The permittee must achieve compliance with the final water quality-based effluent limitations for cadmium, lead and zinc. Deliverable: The permittee must provide written verification to the EPA and the IDEQ that the final water quality-based effluent limitations for cadmium, lead and can be reliably met.

Footnote a. Tasks 4-7 are required only if the permittee is unable to meet the final water quality-based effluent limitation through I/I reduction.

VI. 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 permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application including parts B.6 and D so that these data will be available when the permittee applies for a renewal of its NPDES permit.

The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) or on the application for renewal, as appropriate, to the 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 EPA-approved test methods (generally found in 40 CFR part 136) or as specified in the permit.

The following table presents the proposed effluent monitoring requirements for the facility. The sampling location for the final effluent 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" must be reported on the DMR.

Table 13. Permit Monitoring Requirements

Parameter		Monitoring Requirements		
	Units	Sample Location	Sample Frequency	Sample Type
Biochemical Oxygen Demand (BOD_5)	mg/L lb/day	Influent & Effluent	1/week	24-hour composite
	% removal	% removal	1/month	Calculation[5]
Total Suspended Solids (TSS)	mg/L lb/day	Influent & Effluent	1/week	24-hour composite
	% removal	% removal	1/month	Calculation[5]
E. coli Bacteria[1,2]	#/100 ml	Effluent	5/week	grab
pH	s.u.	Effluent	5/week or continuous	Grab or measurement
Total Residual Chlorine[2]	µg/L lb/day	Effluent	5/week or continuous	Grab or measurement
Total Ammonia (as N)	mg/L lb/day	Effluent	1/week	24-hour composite
Cadmium	µg/L lb/day	Effluent	1/month	24-hour composite
Lead	µg/L lb/day	Effluent	1/month	24-hour composite
Zinc	µg/L lb/day	Effluent	1/month	24-hour composite
Flow	mgd	Influent or Effluent	Continuous	Measurement
Temperature	ºC	Effluent	5/week	Grab
Temperature	ºC	Effluent	Continuous[6]	Measurement
Dissolved Oxygen	mg/L	Effluent	1/month	Grab
Alkalinity, Total	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Hardness, with metals sampling	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Nitrate + Nitrite	mg/L	Effluent	1/month	24-hour composite
Oil and Grease	mg/L	Effluent	1/month	Grab
Orthophosphate, Total (as P)	mg/L	Effluent	1/month	24-hour composite
Total Phosphorus	mg/L	Effluent	1/month	24-hour composite

Parameter		Monitoring Requirements		
	Units	Sample Location	Sample Frequency	Sample Type
Total Kjeldahl Nitrogen	mg/L	Effluent	1/month	24-hour composite
Whole Effluent Toxicity, Chronic[3]	TU_c	Effluent	Quarterly during the year 2014	24-hour composite
Expanded Effluent Testing[4]		Effluent	Quarterly during the year 2014	24-hour composite

References in footnote refer to permit sections.

1. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml. See Part VI for a definition of geometric mean.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See I.B.2. and III.G.

   The limits for total residual chlorine are not quantifiable using EPA approved analytical methods. The Minimum Level (ML) for chlorine is 50 µg/L. When the daily maximum and average monthly effluent concentration is below the ML, EPA will consider the permittee in compliance with the total residual chlorine limitations.
3. Refer to I.C.
4. See NPDES Permit Application Form 2A, Part D for the list of pollutants to include in this testing. Testing is required quarterly during the year 2013 and results submitted with DMRs for the 1st month of each quarter (April, July, October and January). Additionally, the expanded effluent testing must occur on the same day as a whole effluent toxicity test and must be submitted with the WET test results as well as with the next permit application.
5. The monthly average percent removal must be calculated from the arithmetic mean of the influent concentration values and the arithmetic mean of the effluent concentration values for that month. Influent and effluent samples must be taken over approximately the same time period.
6. The permittee must monitor the effluent temperature continuously for a period of one year from January 1, 2014 through December 31, 2014. The daily average and daily maximum temperatures must be reported with the monthly DMR (may be in a separate report attached to DMR). Additionally, the data must be submitted in an electronic format to the EPA and the IDEQ at the time the application for permit renewal is submitted.

C. Surface Water Monitoring

Surface water monitoring is necessary to fully evaluate the potential of the permitted discharge to cause or contribute to non-attainment of the water quality standards.

The following table presents the proposed surface water monitoring requirements for the draft permit.

Table 14. Receiving Water Monitoring

Parameter	Units	Sample Locations	Sample Frequency	Sample Type	Method Detection Limit (MDL)
River Flow	cfs	Upstream only	Continuous	Measurement, as daily average	—
Temperature	ºC	Upstream only	Continuous (in 2014 only)	Measurement, as daily max.	—
Temperature	ºC	Upstream of the point of discharge as described in I.D.1.a. and as approved by IDEQ	Semi-Annually[1]	Grab	—
Alkalinity (as $CaCO_3$)	mg/L			Grab	—
E. Coli	#/100 ml			Grab	—
Dissolved Oxygen	mg/L			Grab	—

Parameter	Units	Sample Locations	Sample Frequency	Sample Type	Method Detection Limit (MDL)
pH	standard units	Upstream of the point of discharge as described in I.D.1.a. and as approved by IDEQ	Semi-Annually[1]	Grab	—
Turbidity	NTU			Grab	—
Total Phosphorus	mg/L			Grab	Refer to 1.B.5 in permit
Total Ammonia (as N)	mg/L			Grab	Refer to 1.B.5 in permit
Hardness (as $CaCO_3$)	mg/L			Grab	Refer to 1.B.5 in permit
Arsenic[2]	µg/L			Grab	—
Cadmium[3]	µg/L			Grab	Refer to 1.B.5 in permit
Chromium[3]	µg/L			Grab	—
Copper[3]	µg/L			Grab	—
Cyanide	µg/L			Grab	—
Lead[3]	µg/L			Grab	Refer to 1.B.5 in permit
Mercury[3]	µg/L			Grab	—
Nickel[3]	µg/L			Grab	—
Selenium[3]	µg/L			Grab	—
Silver[3]	µg/L			Grab	—
Zinc[3]	µg/L			Grab	Refer to 1.B.5 in permit

1. Once during low flow (June-November) period and once during high flow (December-May) period.
2. Analyze samples for total.
3. Analyze samples for both total recoverable and dissolved.

D. Monitoring and Reporting

The draft permit includes new provisions to allow the permittee the option to submit Discharge Monitoring Report (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. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR § 122.41 and § 403.12. The permittee may use NetDMR after requesting and receiving permission from the EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to the EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to the EPA.

The EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings events and contacts, is provided on the following website: http://www.epa.gov/netdmr.

VII. Sludge (Biosolids) Requirements

The EPA Region 10 separates wastewater and sludge permitting. The EPA has the authority under the CWA to issue separate sludge-only permits for the purpose 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.

VIII. 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 permittee is required to update the Quality Assurance Plan for the facility within 60 days of the effective date of the final permit. The Quality Assurance Plan shall include standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation and Maintenance Plan

The permit requires the permittee 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 of the effective date of the final permit. The plan shall 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 toxic pathogens and other toxic pollutants. 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 EPA-approved state water quality standards.

The permit contains language to address SSO reporting, public notification, and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. Additionally, 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 systems 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. Design Criteria

The previous permit included a condition that required the permittee to compute average values for flow, TSS and BOD_5 loading entering the facility. When average values reached 85% of the design criteria below, the permittee was to develop a plan and schedule for addressing design capacity constraints.

Table 15. WWTP Design Criteria

Criteria	Value	85% of Design	Units
Average Flow	4.3	3.7	mgd
Influent BOD_5 Loading	2,840	2,431	lbs/day

Criteria	Value	85% of Design	Units
Influent TSS Loading	2,840	2,431	lbs/day

The proposed draft permit again contains a provision requiring the permittee to compare influent flow and loading to the facility's design flow and loading and prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the annual average flow or loading exceeds 85% of the design criteria values for three consecutive months.

E. Pretreatment Requirements

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

F. Standard Permit Provisions

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

IX. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species.

A review of threatened and endangered species located in Idaho finds that there are no threatened and endangered species in Shoshone County, refer to Appendix F. The EPA has determined that issuance of this permit will not affect any threatened or endangered species in the vicinity of the discharge. Therefore, consultation is not required under Section 7 of the Endangered Species Act.

B. Essential Fish Habitat

Essential fish habitat (EFH) includes 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, current) requires the EPA to consult with the NOAA Fisheries when a proposed discharge has the potential to adversely affect (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.

A review of EFH located in Idaho finds that there is no EFH in Shoshone County. The EPA has determined that issuance of this permit will not affect EFH, reference Appendix F.

C. State Certification and Tribal Consultation

Section 401 of the CWA requires 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.

The Coeur d'Alene Tribe reservation is located at the south end of Lake Coeur d'Alene. The South Fork Coeur d'Alene River joins the North Fork Coeur d'Alene River near Pinehurst to form the Coeur d'Alene River. The Coeur D'Alene River flows into Lake Coeur d'Alene just north of the reservation boundary as shown in the figure below. The EPA invited the tribe to review and/or consult on this permit because of the discharge's potential to impact Lake Coeur d'Alene. Refer to Appendix G and H.

D. Permit Expiration

The permit will expire five years from the effective date.

X. References

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

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

SF Coeur d'Alene River TMDL Revision and Addendum, Idaho Department of Environmental Quality, February 2010.

Appendix A: Process Diagram[6]

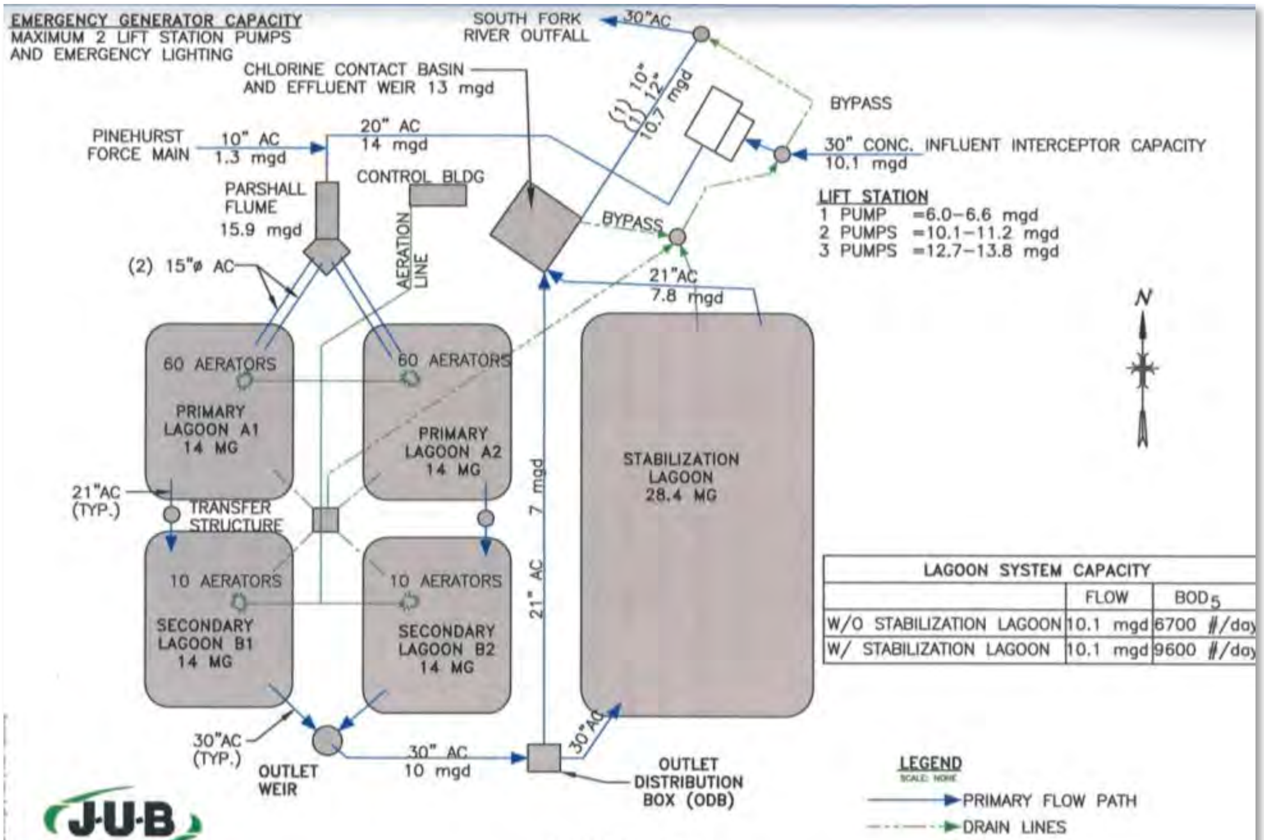


FIGURE 3-1
EXISTING PAGE WWTP
UNIT PROCESS CAPACITY SCHEMATIC

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[6] South Fork Coeur d'Alene River Sewer District, I/I Evaluation and Wastewater Treatment Facility Plan, J-U-B Engineers, Inc., April, 2000.

Appendix B: Discharge Monitoring Report Summary and Effluent Data

A. DMR Data Summary August 2006 through July 2011

Monitoring Location Desc	Raw Sewage Influent	Raw Sewage Influent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Percent Removal	Effluent	Effluent	Effluent	Effluent	Percent Removal	Effluent	Effluent
Parameter Desc	BOD, 5-day, 20 deg. C	Solids, total suspended	Flow, in conduit or thru treatment plant	Flow, in conduit or thru treatment plant	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day,% removal	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, suspended % removal	pH	pH
Statistical Base Short Desc	MO AVG	MO AVG	DAILY MX	MO AVG	MO AVG	MO AVG	WKLY AVG	WKLY AVG	MN % RMV	MO AVG	MO AVG	WKLY AVG	WKLY AVG	MN % RMV	MAXIMUM	MINIMUM
Limit Unit Short Desc	mg/L	mg/L	Mgal/d	Mgal/d	lb/d	mg/L	lb/d	mg/L	%	lb/d	mg/L	lb/d	mg/L	%	SU	SU
Limits	**report**	**report**	**report**	**report**	**1100**	**30**	**1600**	**45**	**65**	**630**	**30**	**1160**	**45**	**65**	**9**	**6.5**
eff 7/31/09				**4.3**												
				<2.0 equals	**43**											
				>2.0 - <3.5	**29**											
				>3.5	**12**											
8/31/2004	103.5	209.7	1.96	1.35	81	7.5	105.4	10.1	92	91.2	8.6	141.8	13.6	96	7.4	7.1
9/30/2004	130.2	186.9	1.93	1.31	65.5	6.1	107.5	9.7	95.4	72.7	6.7	122.9	11.1	96.5	7.4	7.2
10/31/2004	203.3	257.2	1.95	1.55	116.6	9.5	200.3	16.7	94.8	140.1	11.6	267.2	22.3	95.6	7.4	7.3
11/30/2004	164	222	3.68	1.89	81	6	99	7	96	33	3	37	3	99	7.4	7.3
12/31/2004	87	120	3.38	2.46	170	8	293	11	**80**	149	7	258	9	89	7.3	7.2
1/31/2005	90	127	4.38	2.18	214	8	418	14	88	134	6	294	8	94	7.3	7.2
2/28/2005	115	161	2.47	1.89	113	7.1	160	8.1	94	73	4.7	96	5.3	97	7.3	7.2
3/31/2005	151	243	3.95	1.88	143	8	289	10	92	152	9	337	11	94	7.3	7.1
4/30/2005	88	111	3.75	2.81	208	9	262	11	89	228	10	377	15	90	7.3	7.3
5/31/2005	120	174	2.4	1.9	150	9	188	11	92	112	7	123	8	96	7.3	7.2
6/30/2005	166	251.6	2	1.5	96.6	7.6	116.2	8.3	91.7	111.8	8.9	143.9	11.8	93.6	7.3	7.2
7/31/2005	193	290	1.54	1.37	94	8	112	10	95	99	9	114	11	96	7.4	7.4
8/31/2005	164	224	1.42	1.28	118	12	156	16	93	151	15	176	17	93	7.4	7.4
9/30/2005	172	257	2.06	1.2	147	16	174	19	90.7	189	21	263	30	91.7	7.4	7.2
10/31/2005	162	240	3.37	1.47	109	10	167	13	93	114	10	175	14	95	7.2	7
11/30/2005	181	279	1.94	1.56	82	6.2	103	8.4	96.5	63	4.7	111	7.1	98.1	7.4	7
12/31/2005	262	436	4.18	2.32	167	8	399	13	96	182	8	477	15	97	7.5	6.9
1/31/2006	75.6	99.4	6.74	4.59	257	6.2	543	8.3	90.3	228.6	5.5	471.4	9.1	94	7.4	7.2
2/28/2006	103	188	4.34	2.96	130	5.8	135	6.8	93	126	5.6	135	6.5	95.7	7.2	7.1
3/31/2006	74.7	114	3.88	3.08	187	7	275	9	89.5	227.5	8.4	299.6	9.3	91.3	7.1	7.1
4/30/2006	64.46	85.51	4.81	3.71	336.32	11.26	423.84	14.28	**83**	445.87	14.81	584.86	18.47	**83**	7.3	7.1
5/31/2006	105.8	171.1	3.17	2.63	312.6	14.3	453.4	19.6	86.5	345.7	16.3	715.1	34.3	90.5	7.2	7
6/30/2006	80.9	132.9	2.78	2.1	170.9	9.2	283.6	12.2	88.6	181.2	10.5	282.3	15.2	92.1	7.4	7.2
7/31/2006	115.45	177.9	1.68	1.49	100.9	7.6	128.4	9.6	93.4	159.6	12.5	204.6	14.6	93	7.6	7.4
8/31/2006	124.95	182.35	1.51	1.32	114.51	10.01	136.17	12.09	92	183.53	16.11	220.34	19.33	91.2	7.6	7.5
9/30/2006	173.4	225.7	1.5	1.27	89.5	8.3	119.2	11.7	95.2	189.1	17.7	362.9	35.7	92.2	7.7	7.5
10/31/2006	136.6	208.4	1.41	1.3	57.4	5.26	63.4	5.99	96.1	97.3	9.03	100.8	9.51	95.7	7.5	7.4
11/30/2006	118.8	172.3	4.08	2.77	171.4	7.46	301.7	8.87	93.7	189.9	8.61	297.2	11.06	95	7.4	7.3
12/31/2006	88.7	169.5	4.37	2.81	144.3	6.1	177.2	7.2	93.1	289.3	13.1	422.8	21.9	92.3	7.3	7.3
1/31/2007	106.7	191.6	3.91	2.73	125.2	5.14	183.9	5.98	95.2	141.9	6.01	180.1	7.44	96.9	7.3	7.3
2/28/2007	51.2	90.4	4.37	2.97	150.9	5.6	257.9	7.4	89.2	171.4	6.2	278.5	7.6	93.1	7.4	7.3
3/31/2007	54.9	97.24	6.02	4.43	232.85	5.67	282.96	6.91	89.7	337.73	8.34	424.09	9.79	91.4	7.4	7.3
4/30/2007	74.56	115.75	4.34	3.09	192.35	7.28	223.81	8.24	90.2	305.83	11.49	411.81	12.47	90.1	7.4	7.4
5/31/2007	119.88	189.69	2.84	2.45	220.06	10.81	279.96	13.11	91	282.38	13.77	432.83	18.87	92.7	7.4	7.2
6/30/2007	138.03	211.48	2.14	1.71	195.02	13.16	232.76	16.51	90.5	246.15	17.95	272.16	21.07	91.5	7.5	7.3
7/31/2007	123.59	227.39	1.79	1.42	131.81	10.71	168.09	14.93	91.3	227.5	19.47	275.14	24.08	91.4	7.6	7.5
8/31/2007	128.7	206	1.54	1.36	102.3	8.63	123.7	11.4	93.3	158.6	14.1	185.7	16.7	93.2	7.7	7.6
9/30/2007	148.8	261.6	1.46	1.37	123.5	10.3	159.5	14.4	93.1	133.1	11.9	164.8	15.2	95.5	7.7	7.4
10/31/2007	136.2	222.6	1.83	1.52	116.6	8.75	166.5	10.91	93.6	91.2	7.09	155.7	11.4	96.8	7.7	7.3
11/30/2007	104.3	164.7	2.5	1.71	135.4	9.1	191.7	11.4	91.3	121.5	8.7	154.5	12.4	94.8	7.3	7.3
12/31/2007	86.86	167.4	4.8	2.45	189.9	7.86	316.7	11.99	91	159.3	6.96	238.1	8.14	95.8	7.3	7.3
1/31/2008	106.92	234.78	2.92	2.18	109.56	6.2	137.1	7.15	94.2	130.03	7.64	179.95	9.51	96.7	7.3	7.3
2/29/2008	81.6	208.6	3.21	2.61	139.4	6.3	176.6	6.7	92.3	201.6	9	246	11.1	95.7	7.3	7.3
3/31/2008	35.7	63.6	4.69	3.96	204.3	6.1	257.2	7.8	**83**	357.1	10.6	466.9	14.1	**83.3**	7.3	7.3
4/30/2008	67.8	142.1	5.01	3.82	197.1	5.68	386.9	9.39	91.6	272.9	8.12	445.1	11.9	94.3	7.3	7.3
5/31/2008	44.2	85.7	6.61	4.6	160.3	4	211.3	4.8	91	268.3	6.3	527	10.1	92.7	7.3	7.1
6/30/2008	72.3	187.6	4.07	3.35	275.8	9	457.7	13.9	87.5	280.9	9.1	627.8	19.1	95.2	7.2	7.2
7/31/2008	154.5	265.7	2.87	1.85	234.6	13.2	533.2	22.3	91.5	195.5	11.5	341.3	14.3	95.7	7.3	7.2
8/31/2008	105.6	171.8	2.01	1.76	82.5	5.4	108	6.7	94.8	117.8	7.9	173.4	12.5	95.4	7.4	7.2
9/30/2008	114.4	223.4	1.89	1.59	94.9	7.3	128.9	10.1	93.6	185.5	14.2	218.8	17.2	93.6	7.8	7.4
10/31/2008	115.55	258.42	1.62	1.5	127.34	10.42	140.88	11.65	91	156.04	12.78	177.33	14.66	95.1	7.8	7.7
11/30/2008	114.83	270.12	2.07	1.69	110.08	7.69	185.42	11.89	93.3	100.89	7.2	121.19	8.7	97.3	7.7	7.6
12/31/2008	98.58	166.14	2.55	2.02	98.34	5.6	149.62	7.73	94.3	90.19	5.47	121.53	8.23	96.7	7.7	7.7
1/31/2009	84.87	169.99	7.31	2.92	205.25	7.21	439.35	11.35	91.5	280.05	10.21	575.03	14.89	94	7.7	7.3
2/28/2009	113.33	320.87	4.08	2.09	129.89	7.74	183.33	8.49	93.2	171.77	10.7	185.29	12.7	96.7	7.4	7.3
3/31/2009	91.97	182.06	5.37	3.96	328.06	9.78	453.45	14.66	89.4	337.7	10.35	385.17	12.45	94.3	7.5	7.3
4/30/2009	69.6	118.2	4.48	3.77	186.22	5.78	257.94	7.49	91.7	294.19	9.02	551.11	16	92.4	7.6	7.4
5/31/2009	87.77	200.28	3.77	3.2	169.55	6.02	234.15	7.45	93.1	422	14.25	1079.44	34.33	92.9	7.6	7.5
6/30/2009	107.53	182.49	3.21	2.13	182.09	10.31	219.64	13.4	90.4	207.42	11.76	261.46	16.19	93.6	7.5	7.3
7/31/2009	126.59	241.13	1.97	1.54	99.25	7.73	138.25	10.98	93.9	148.89	11.6	167.69	13.32	95.2	7.6	7.3
8/31/2009	128.77	268.82	2.03	1.49	85.65	7.16	110.24	9.51	94.4	117.01	9.79	161.47	13.93	96.4	7.6	7.5
9/30/2009	139.29	299.99	1.57	1.41	210	17.9	286.15	25.04	87.2	223.78	19.11	246.86	21.61	93.6	7.6	7.4
10/31/2009	120.75	248.76	2.17	1.7	98.66	7.46	152.34	10.5	93.8	109.75	8.42	152.42	11.07	96.6	7.5	7.3
11/30/2009	148.08	265.98	1.9	1.71	80.4	5.69	94.69	6.56	96.2	94.05	6.8	124.96	10.06	97.4	7.3	7.3
12/31/2009	127.29	225.95	2.2	1.93	88.21	5.83	146.03	9.03	95.4	90.9	6.08	123.43	7.29	97.3	7.4	7.3
1/31/2010	121.17	252.72	2.64	1.99	97.07	5.57	129.31	7.28	95.4	106.86	6.16	148.33	8.16	97.6	7.3	7.2
2/28/2010	154.5	265.95	1.95	1.76	77.88	5.38	98.93	6.66	96.5	103.07	7.15	127	8.61	97.3	7.4	7.2
3/31/2010	91.63	110.39	2.91	1.8	165.4	10.25	292.32	13.53	88.8	127.33	7.57	279.66	12.37	93.1	7.3	7.3
4/30/2010	68.56	89.29	3.06	2.34	212.59	10.62	250.78	12.17	**84.5**	180.69	9.11	214.42	11.38	89.8	7.3	7.1
5/31/2010	77.05	111.87	3.58	2.52	219.69	11.29	321.71	14.6	85.4	219.67	11.38	321.71	16.07	89.8	7.1	7
6/30/2010	60.09	74.38	3.98	3.22	387.25	15.49	494.9	19.65	**74.2**	531.78	21.27	697.37	25.3	**71.4**	7.2	7.1
7/31/2010	88.94	125.62	2.28	1.73	161.55	11.66	192.14	14.4	86.9	245.55	17.7	270.74	20.29	85.9	7.2	7.2
8/31/2010	102.84	162.96	1.66	1.51	269.27	21.6	345.27	28.31	**79**	266.9	21.3	312.64	25.68	86.9	7.2	7
9/30/2010	121.82	180.58	1.8	1.54	327.75	25.4	484.81	32.17	**79.1**	325.73	25.4	441.14	34.57	85.9	7.2	7.1
10/31/2010	104.35	161.36	2.03	1.57	160.19	12.51	359	28.13	88	197.11	15.59	293.65	23.01	90.3	7.2	7
11/30/2010	130.77	166.74	2.66	1.92	71.93	4.45	101.3	5.68	96.6	101.37	6.48	161.67	11.27	96.1	7.2	7.1
12/31/2010	69.74	88.39	4.67	2.46	159.89	6.96	362.13	9.3	90	200.46	8.97	402.13	10.32	89.9	7.2	7.2
1/31/2011	67.9	81.86	8.05	3.62	234.65	6.98	533.7	9.37	89.7	323.74	10.4	649.45	12.83	87.3	7.3	7
2/28/2011	70.96	95.01	3.2	2.64	81.57	3.53	121.98	4.94	95	95.49	4.24	136.96	5.46	95.5	7.2	7.2
3/31/2011	68.53	105.92	5.37	3.69	219.24	6.6	489.28	10.93	90.4	340.3	10.51	628.41	14.03	90.1	7.2	7.1
4/30/2011	44.86	60.36	6.82	4.36	264.78	7.7	373.41	9.84	**82.8**	458.22	13.15	644.75	15.62	**78.2**	7.2	7.1
5/31/2011	61.11	95.67	5.29	3.71	424.46	17.03	624.16	19.59	**77.7**	526.72	17.03	728.62	19.59	**82.2**	7.3	7.2
6/30/2011	81.18	134.31	3.59	2.75	163.6	6.93	308.45	12.25	91.5	174.46	7.05	468.97	18.62	94.7	7.4	7.2
7/31/2011	132.2	193.79	2.03	1.66	189.88	14	335.89	26.32	89.4	195.6	14.44	394.83	30.94	92.5	7.5	7.4
Average	110.3	183.6	3.2	2.3	163.4	8.8	247.4	11.8	90.9	198.9	10.6	306.8	14.8	92.9	7.4	7.3
Minimum	35.7	60.36	1.41	1.2	57.4	3.53	63.4	4.8	74.2	33	3	37	3	71.4	7.1	6.9
Maximum	262	436	8.05	4.6	424.46	25.4	624.16	32.17	96.6	531.78	25.4	1079.44	35.7	99	7.8	7.7
Count	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Std Dev	41.4	71.9	1.6	0.9	77.7	3.9	134.4	5.7	4.7	107.3	4.7	197.2	7.2	4.8	0.2	0.2
CV	0.376	0.392	0.482	0.398	0.475	0.449	0.543	0.479	0.052	0.539	0.438	0.643	0.488	0.052	0.023	0.023
95th Percentile	173.19	277.668	6.5215	3.96	325.4775	15.9235	494.057	24.629	96.085	412.265	19.416	648.745	30.799	97.3	7.7	7.5
5th Percentile																

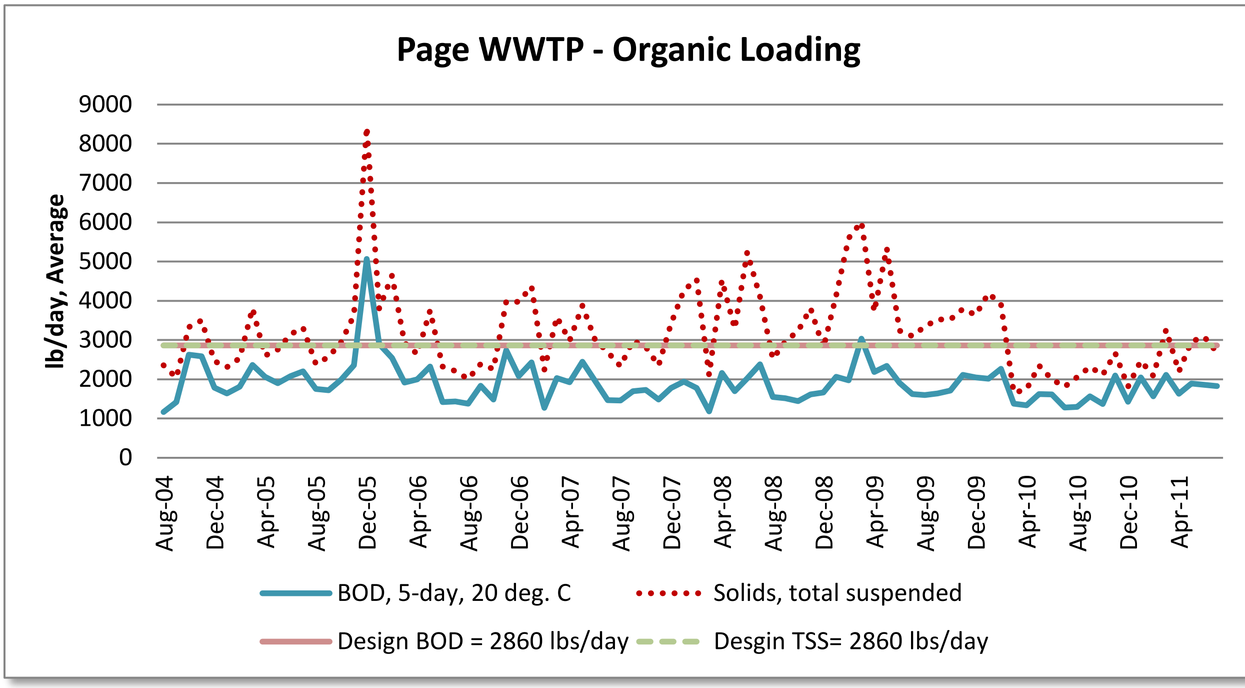
	Monitoring Location Desc	See Comments	See Comments	See Comments	See Comments	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
	Parameter Desc	Chlorine, total residual	Chlorine, total residual	Chlorine, total residual	Chlorine, total residual	E. coli, MTEC-MF	E. coli, MTEC-MF	Hardness, total (as CaCO3)	Nitrite plus nitrate total 1 det. (as N)	Nitrogen, ammonia total (as N)	Nitrogen, ammonia total (as N)	Nitrogen, ammonia total (as N)	Nitrogen, ammonia total (as N)	Nitrogen, Kjeldahl, total (as N)	Phosphorus, total (as P)	Temperature, water deg. centigrade	Toxicity, final conc toxicity units
	Statistical Base Short Desc	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	MO GEOMN	DAILY MX	DAILY MX	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	DAILY MX	DAILY MX
	Limit Unit Short Desc	lb/d	mg/L	lb/d	mg/L	#/100mL	#/100mL	mg/L	mg/L	lb/d	mg/L	lb/d	mg/L	mg/L	mg/L	deg C	toxic
	Limits					**576**	**126**	**report**	**report**	**760**	**21.2**	**445**	**12.4**	**report**	**report**	**report**	**report**
permit enforcement limits	**<2.0**	**variable**	**0.1**	**variable**	**0.1**												
	>2.0 - <3.5	**2.9**	**0.1**	**2.9**	**0.1**												
	>3.5	**3.6**	**0.1**	**3.6**	**0.1**												
July 1 - Nov. 30	**<2.0**	**2.5**	**0.15**	**0.8**	**0.048**												
	>2.0 - <3.5	**2.7**	**0.091**	**0.88**	**0.03**												
	>3.5	**2.8**	**0.078**	**0.93**	**0.026**												
Dec. 1 -June 30	**<2.0**	**2**	**0.12**	**0.039**	**0.65**												
	>2.0 - <3.5	**2.2**	**0.075**	**0.73**	**0.025**												
	>3.5	**2.3**	**0.065**	**0.79**	**0.022**												
	8/31/2004	0.94	0.1	0.32	0.03	50	10	58.9	1.92	185	16.5	185	16.5	17.4	2.14	24.4	
	9/30/2004	1.4	0.1	1.08	0.1	14.5	1.9	62.8	5.86	212	18.5	190	17.4	16.8	2.07	19.4	
	10/31/2004	1.36	0.13	1.29	0.1	56.3	8.9	58.6	0.936	219	15.3	180	14	16.6	2.1	13.3	
	11/30/2004	3.06	0.1	1.59	0.1	142.1	17.6	56.7	0.631	255	14.4	165	10.5	14.9	2.15	8.3	
	12/31/2004	5.02	0.16	2.4	0.11	419	18		0.433	227	12.9	225	11	13.4	2.12	6.1	
	1/31/2005	3.9	0.23	1.87	0.11	408	46	67.2	0.221	161	12.4	214	11.8	12	1.55	2.7	
	2/28/2005	2.06	0.1	1.58	0.1	38.3	4.7		0.415	125	9.9	146	9.3	11.7	1.61	5.5	
	3/31/2005	3.29	0.1	1.62	0.1	1986	20		0.226	147	11.7	175	11.2	11.5	1.84	8.3	
	4/30/2005	2.46	0.1	2.46	0.1	25.9	5.1	66.6	0.369	229	9.1	187	8	11.4	1.55	11.6	
	5/31/2005	2	0.1	1.63	0.1	16	3.2		0.828	132	9.3	196	8.6	10.3	1.45	16.1	
	6/30/2005	1.67	0.1	1.25	0.1	5.2	1.7		0.143	181	14.7	156	12.5	12.6	1.87	18.8	
	7/31/2005	1.39	0.12	1.37	0.1	5.2	2.4	63.7	0.821	202	18.5	194	17	17.1	2.6	23.8	
	8/31/2005	1.68	0.15	1.26	0.12	154.1	2.6		0.348	210	19.3	197	18.5	20.3	2.97	23.8	
	9/30/2005	1.72	0.15	1.08	0.11	27.5	3		3.4	133	14.8	131	13.1	17.5	2.7	19.4	
	10/31/2005	1.5	0.1	1.15	0.1	152.9	13.2	67.2	5.15	157	13.8	150	12.3	12.2	2.26	13.8	
	11/30/2005	2.2	0.17	1.49	0.11	88.8	14.5		3.78	202	15.1	166	12.8	9.98	2.28	10.5	
	12/31/2005	3.47	0.13	1.84	0.1	422.5	58.6		0.235	265	15	265	13.7	15.8	2.24	2.2	
	1/31/2006	5.44	0.15	3.92	0.1	1046.2	28.9	65.2	0.304	268	7.9	222	5.8	10.4	1.49	5.5	5.74
	2/28/2006	3.44	0.1	2.47	0.1	172.5	11.4		0.1	130	7.1	144	6.2	7.13	1.12	5.1	
	3/31/2006	3.24	0.1	2.61	0.1	29.5	14.8		0.445	244	8.1	190	7.3	8.94	1.36	5.5	
	4/30/2006	3.41	0.1	3.08	0.1	53.6	17.9	64.6	1.97	194.53	6.85	131.72	5.47	8.64	1.52	10.8	
	5/31/2006	2.63	0.1	2.19	0.1	29.8	3.7		0.92	189.4	9.6	145.8	7	7.06	1.34	17.8	
	6/30/2006	2.32	0.1	1.71	0.1	14.6	2.2		0.88	224.4	10.1	171.8	9.8	12.3	1.65	19.7	
	7/31/2006	1.4	0.1	1.26	0.1	36.4	6.9	63.9	0.51	174.8	13.7	164	12.8	13.2	2.03	26.1	5.76
	8/31/2006	1.26	0.1	1.14	0.1	21.6	6.6		1.3	187.35	16.1	172.33	15.18	17.2	2.53	23.3	
	9/30/2006	1.25	0.1	1.07	0.1	3.1	1.5		0.62	227.7	18.3	190	17.3	20.6	2.53	20.5	
	10/31/2006	1.3	0.12	1.12	0.1	23.8	2.8	70.1	0.51	197	18.6	195	18.1	19.5	2.69	15.7	
	11/30/2006	3.4	0.1	2.36	0.1	658	64.2		0.41	551.2	16.9	306.2	13.6	18.8	2.75	8	
	12/31/2006	3.64	0.1	2.37	0.1	50.4	6.6		1.1	239.4	9.6	210.7	8.9	10.8	1.7	3.4	
	1/31/2007	3.26	0.1	2.3	0.1	372.5	64.3	66.1	2.67	259.2	9.59	201.4	8.56	9.83	1.46	3.4	1.49
	2/28/2007	3.64	0.11	2.52	0.1	517.2	57		0.57	351.3	9.95	242.4	9.3	10.7	1.72	5	
	3/31/2007	5.02	0.1	3.79	0.1	365.4	24.9		0.44	303.93	7.06	238.14	6.08	8.53	1.45	8.8	
	4/30/2007	3.56	0.1	2.6	0.1	30.9	7	76.7	0.8	172.07	6.83	156.26	6	7.3	1.07	11.5	
	5/31/2007	2.37	0.1	2.03	0.1	33.6	7		0.46	178.89	10.5	168.04	8.5	9.98	1.59	17.7	
	6/30/2007	1.78	0.1	1.42	0.1	517.2	29.1		0.75	174.36	11	142.53	10.13	13.4	2.24	20	
	7/31/2007	1.49	0.11	1.2	0.1	21.6	7.8	71.2	0.43	192.61	15.1	162.92	13.83	14.9	2.27	25.5	
	8/31/2007	1.5	0.12	1.2	0.1	209.8	7.5		3.28	180.2	15.5	168.5	14.9	18.1	2.58	25	
	9/30/2007	1.36	0.12	1.15	0.1	49.6	21.2		1.64	183.3	16.4	170.7	15.13	16.8	2.71	21.7	
	10/31/2007	1.73	0.13	1.31	0.1	214.2	43.3	79.8	0.3	202.4	15.6	187.3	14.7	16.8	2.76	57	
	11/30/2007	2.37	0.15	1.67	0.12	648.8	54.2		0.34	213.3	15.2	188.8	13.3	16	1.85	11.7	
	12/31/2007	4	0.12	2.23	0.1	517.2	166.4		0.5	353.2	10	225.9	9.75	11.6	1.7	4	
	1/31/2008	3.5	0.19	2.47	0.14	2419.6	202.4	65.5	4.12	211	11.5	185.11	10.84	11.7	2.14	3.3	
	2/29/2008	5.2	0.26	4.11	0.19	60.9	7.8		0.46	310.6	11.6	228.7	10.2	11.3	1.76	4.2	
	3/31/2008	6.39	0.22	4.95	0.15	224.7	38.2		3.18	260.6	8.4	241	7.1	9.45	1.66	9.2	
	4/30/2008	6.37	0.2	4.88	0.15	135	9.6	94.3	0.58	265.3	6.44	189.3	5.71	7.58	1.07	9.4	
	5/31/2008	8.08	318	4.34	311	123.4	24.2		0.53	194.8	5	151.7	3.8	7	1.2	14.6	
	6/30/2008	3.4	0.1	2.8	0.1	19.7	4.1		1.3	191.1	8	169.5	5.9	6.7	1.4	17.2	
	7/31/2008	2.39	0.1	1.56	0.1	18.3	3.2	73.5	0.54	199.2	13.2	170.9	10.6	10.4	1.67	23.3	
	8/31/2008	2.09	0.13	1.56	0.1	20.9	3.8		0.41	270.2	16.7	243.3	16.1	16.2	2.42	22.5	
	9/30/2008	1.63	0.12	1.34	0.1	137.4	45.1		0.64	210.8	15.8	194.5	14.9	18	2.19	18.2	
	10/31/2008	1.7	0.14	1.29	0.1	98.8	35.4	77.1	1.01	178.89	14.6	170.16	13.92	15.3	2.44	16.1	
	11/30/2008	2.19	0.15	1.47	0.1	248.1	120.6		0.81	230.82	14.8	201.59	14.35	16.4	2.15	8.9	
	12/31/2008	3.06	0.18	1.88	0.11	499.6	99.4		0.1	285.83	14.4	228.46	13.22	14.9	2.48	6.1	
	1/31/2009	9.54	0.28	4.36	0.19	1046.2	25.1	80.8	0.1	440	11.4	230.47	8.64	13	2.03	4.4	
	2/28/2009	3.92	0.14	1.97	0.11	328.2	57.5	77.8	0.33	252.9	11.9	181.23	10.86	13.6	2.18	4.4	
	3/31/2009	5.75	0.19	4.31	0.13	378.4	104.3		0.1	433.92	12.3	291.88	8.81	11.3	1.9	8.9	1
	4/30/2009	6.21	0.18	4.11	0.12	248.9	11.5	81.6	1.14	233.1	6.44	195.25	6.16	7.8	1.07	10	
	5/31/2009	4.24	0.18	2.88	0.11	24.6	8.8		0.58	194	7.09	176.06	6.34	6.75	1.18	14.9	
	6/30/2009	2.67	0.1	1.82	0.1	51.2	4		0.86	167.75	11.3	162.75	9.2	9.39	1.45	21.3	
	7/31/2009	1.71	0.14	1.34	0.1	31.8	9.3	93	0.42	221.51	16	179.96	13.92	12.4	2.01	22.2	
	8/31/2009	1.86	0.12	1.3	0.1	80.9	6.5		1.2	227.94	18.1	201.47	16.73	17.7	1.91	25	
	9/30/2009	1.79	0.15	1.42	0.12	501.2	50.7		2.22	136.19	11.5	88.47	7.51	14.5	2.26	21.7	
	10/31/2009	1.86	0.13	1.45	0.1	123.6	31	92.3	5.92	197.07	13.9	164.38	12.38	12.9	1.56	12.2	
	11/30/2009	1.98	0.13	1.54	0.11	52.8	19.9		0.1	220.75	15.3	195.81	13.85	14.1	3.15	7.8	
	12/31/2009	3.79	0.24	2.19	0.14	571.7	235.5		0.1	218.42	14.1	196.67	13.42	15.3	2.17	5.3	
	1/31/2010	4.5	0.3	3.6	0.22	1299.7	31.7	87.1	0.1	233.52	12.5	196.54	11.42	14.8	1.99	5.6	
	2/28/2010	3.24	0.21	2.5	0.17	365.4	62.9		0.1	194.47	13.1	178.3	12.38	14	2.11	7.2	1
	3/31/2010	2.78	0.2	1.97	0.13	74.3	21.3		0.1	307.38	14.2	215.02	13.7	14.2	2.03	8.9	
	4/30/2010	3.11	0.16	1.72	0.09	143.9	11.1	82.9	0.1	236.49	11.6	221.94	11.15	13	1.73	13.9	
	5/31/2010	2.61	0.1	1.36	0.06	31.3	2.2	78.9	0.1	220.89	8.16	161.56	7.86	9.84	1.27	15.8	
	6/30/2010	2.73	0.1	1.7	0.07	113	22.7		0.8	214.08	8.12	182.53	7.27	10.2	1.73	18.9	
	7/31/2010	1.81	0.13	1.22	0.09	8.6	2.1	82.8	0.1	193.6	13.9	165.33	11.93	11.7	3.93	22.7	
	8/31/2010	1.97	0.15	1.56	0.12	198.9	56.5		0.1	159.38	13	147.78	11.78	13.8	2.26	23.3	1.28
	9/30/2010	3.07	0.22	2.34	0.18	260.3	44.5		3.11	157.95	10.7	112.09	8.69	12	2.25	18.6	
	10/31/2010	1.95	0.2	1.44	0.11	517.2	218.8	79.4	10.9	167.84	11.5	115.78	8.99	6.48	1.95	16.7	
	11/30/2010	4.79	0.29	2.8	0.17	613.1	53.4	83.7	0.1	239.39	15.6	196.1	12.23	12.9	1.82	10.1	
	12/31/2010	7.7	0.36	5.11	0.26	920.8	12.1	78.6	0.1	233.3	12	171.65	8.59	12.9	1.54	4.2	
	1/31/2011	11.7	0.32	6.97	0.23	517.2	11.1	84.7	0.5	429.49	10.2	236.46	7.96	11.7	1.12	4.2	
	2/28/2011	7.76	0.32	5.78	0.26	88.2	11.8	83.2	0.78	177.74	7.72	152.05	6.74	7.7	0.86	4.4	
	3/31/2011	10.2	0.3	6.72	0.22	172.3	10.1	86.1	0.1	354.7	9.13	217.86	7.52	10.1	1.01	6.7	18.45
	4/30/2011	13.82	0.35	8.56	0.24	148.3	17.4	77.4	0.51	219.84	4.94	143.64	4.07	6.28	0.88	8.9	
	5/31/2011	7.09	0.25	5.53	0.18	30.7	8.5		0.5	147.3	4.76	123.91	4.09	6.92	0.93	13.9	
	6/30/2011	6.32	0.25	4.11	0.17	22.3	3.3		0.91	174.51	8.88	149.29	6.64	6.57	0.96	16.7	
	7/31/2011	2.02	0.15	1.05	0.08	36.8	10.8	74	1.44	191.07	14.5	136.69	9.79	11.5	1.61	20.6	
	Average	3.5	3.9	2.4	3.8	269.7	31.7	75.0	1.1	224.3	12.2	184.3	10.8	12.5	1.9	13.2	5.0
	Minimum	0.94	0.1	0.32	0.03	3.1	1.5	56.7	0.1	125	4.76	88.47	3.8	6.28	0.86	2.2	1
	Maximum	13.82	318	8.56	311	2419.6	235.5	94.3	10.9	551.2	19.3	306.2	18.5	20.6	3.93	26.1	18.45
	Count	84	84	84	84	84	84	37	84	84	84	84	84	84	84	83	7
	Std Dev	2.6	41.8	1.6	40.9	434.1	48.6	10.3	1.8	76.9	3.7	39.1	3.7	3.7	0.6	7.2	6.5
	CV	0.730	10.624	0.666	10.714	1.609	1.534	0.137	1.616	0.343	0.301	0.212	0.341	0.294	0.312	0.544	1.307
	95th Percentile	8.032	0.317	5.467	0.2285	1027.39	118.155	92	4.069	354.475	18.27	242.19	16.9595	18.085	2.744	24.34	14.643
	5th Percentile							59	0.1	137.8	6.5	131.1	5.7	6.8	1.0	3.5	1.0
	5th Percentile for data 2010-2011 (corrosion control for water suppy began)							76									

Monitoring Location Desc	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
Parameter Desc	Cadmium, total recoverable	Cadmium, total recoverable	Cadmium, total recoverable	Cadmium, total recoverable	Copper, total recoverable	Copper, total recoverable	Copper, total recoverable	Copper, total recoverable	Lead, total recoverable	Lead, total recoverable	Lead, total recoverable	Lead, total recoverable	Zinc, total recoverable	Zinc, total recoverable	Zinc, total recoverable	Zinc, total recoverable
Statistical Base Short Desc	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	MO AVG	MO AVG
Limit Unit Short Desc	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L
2004 Variance	0.32	8.8	0.19	5.3	2.2	60	1.1	30	6.5	182	3	84	48	1340	29	802
WQBEL(7/31/09)	0.039	1.1	0.028	0.79	1.04	29	0.72	20	1.2	33	0.53	15	4.8	133	3.2	88
2009 Var. <=4.3	0.3	8.3	0.19	5.3					3.4	96	2.2	63	48	1340	29	802
209 Var.> 4.3	0.32	8.8	0.19	5.3					6.5	182	3	84	48	1340	29	802
8/31/2004	0.005	0.49	0.005	0.49	0.05	5	0.05	5	0.07	7	0.07	7	1	100	1	100
9/30/2004	0.002	0.235	0.002	0.235	0.05	5	0.05	5	0.05	5	0.05	5	0.8	74	0.8	74
10/31/2004	0.006	0.511	0.006	0.511	0.1	9	0.1	9	0.05	4	0.05	4	1.3	107	1.3	107
11/30/2004	0.008	0.541	0.008	0.541	0.1	9	0.1	9	0.1	12	0.1	12	2	124	2	124
12/31/2004	0.01	0.562	0.01	0.562	0.1	9	0.1	9	0.1	9	0.1	9	3	173	3	173
1/31/2005	0.02	1.3	0.02	1.3	0.1	9	0.1	9	0.2	14	0.2	14	4	257	4	257
2/28/2005	0.01	1.2	0.01	1.2	0.1	9	0.1	9	0.09	6	0.09	6	5	3.7	5	3.7
3/31/2005	0.009	0.589	0.009	0.589	0.1	8	0.1	8	0.07	5	0.07	5	2.7	177	2.7	177
4/30/2005	0.04	1.72	0.04	1.72	0.2	8.59	0.2	8.59	0.2	8.66	0.2	8.66	6.7	289	6.7	289
5/31/2005	0.02	1.26	0.01	1.26	0.1	7.51	0.1	7.51	0.2	14.9	0.2	14.9	4.4	223	3.5	223
6/30/2005	0.008	0.699	0.008	0.699	0.07	6.2	0.07	6.2	0.1	13.7	0.1	13.7	1.8	145	1.8	145
7/31/2005	0.01	1.05	0.01	1.05	0.1	9.4	0.1	9.4	0.4	40	0.4	40	1.9	170	1.9	170
8/31/2005	0.01	1.21	0.01	1.21	0.06	5.9	0.06	5.9	0.2	23	0.2	23	0.04	110	0.04	110
9/30/2005	0.006	0.647	0.006	0.647	0.07	7.6	0.07	7.6	0.2	25	0.2	25	1.3	132	1.3	132
10/31/2005	0.004	0.392	0.004	0.392	0.05	4.8	0.05	4.8	0.07	5.85	0.07	5.75	1.2	99	1.2	99
11/30/2005	0.008	0.55	0.008	0.55	0.1	8.9	0.1	8.9	0.2	15	0.2	15	1.4	113	1.4	113
12/31/2005	0.13	0.693	0.13	0.693	0.2	14.6	0.2	14.6	0.3	16.8	0.3	16.8	2.6	135	2.6	135
1/31/2006	0.05	1.7	0.05	1.7	0.4	12.8	0.4	12.8	0.8	24.4	0.8	24.4	10.8	321	10.8	321
2/28/2006	0.08	2.8	0.08	2.8	0.24	7.8	0.24	7.8	3.8	12.4	3.8	12.4	17.5	566	17.5	566
3/31/2006	0.03	1.4	0.03	1.4	0.2	9.9	0.2	9.9	0.3	13.4	0.3	13.4	9.8	365	9.8	365
4/30/2006	0.03	1.02	0.03	1.02	0.18	5.85	0.18	5.85	0.33	10.7	0.33	10.7	8.63	279	8.63	279
5/31/2006	0.07	3.27	0.07	3.27	0.22	10	0.22	10	0.26	11.9	0.26	11.9	9.88	451	9.88	451
6/30/2006	0.03	1.85	0.03	1.85	0.15	8.45	0.15	8.45	0.32	18.3	0.32	18.3	3.62	207	3.62	207
7/31/2006	0.02	1.3	0.02	1.3	0.11	8.92	0.11	8.92	0.36	28.6	0.36	28.6	2.13	171	2.13	171
8/31/2006	0.01	0.93	0.01	0.93	0.09	7.6	0.09	7.6	0.27	23.5	0.27	23.5	1.4	123	1.4	123
9/30/2006	0.01	0.8	0.01	0.8	0.06	6.09	0.06	6.09	0.12	11.3	0.12	11.3	0.75	71	0.75	71
10/31/2006	0.005	0.44	0.005	0.44	0.05	4.62	0.05	4.62	0.16	15	0.16	15	0.77	71	0.77	71
11/30/2006	0.02	0.85	0.02	0.85	0.19	8.02	0.19	8.02	0.61	26.4	0.61	26.4	2.75	119	2.75	119
12/31/2006	0.09	3.67	0.09	3.67	0.51	21.7	0.51	21.7	1.24	53.1	1.24	53.1	10.88	469	10.88	469
1/31/2007	0.02	1.08	0.02	1.08	0.23	10	0.23	10	0.45	19.8	0.45	19.8	5.17	227	5.17	227
2/28/2007	0.01	0.38	0.01	0.38	0.18	7.44	0.18	7.44	0.23	9.46	0.23	9.46	3.94	159	3.84	159
3/31/2007	0.03	0.91	0.03	0.91	0.2	5.51	0.2	5.51	0.28	7.63	0.28	7.63	10.43	282	10.43	282
4/30/2007	0.04	1.49	0.04	1.49	0.13	4.85	0.13	4.85	0.48	18.8	0.48	18.8	13.98	542	13.98	542
5/31/2007	0.03	1.34	0.03	1.34	0.19	9.42	0.19	9.42	0.47	23.2	0.47	23.2	5.07	248	5.07	248
6/30/2007	0.01	0.88	0.01	0.88	0.09	6.03	0.09	6.03	0.16	11.5	0.16	11.5	1.76	123	1.76	123
7/31/2007	0.02	1.47	0.02	1.47	0.12	10	0.12	10	0.32	26.7	0.32	26.7	1.99	168	1.99	168
8/31/2007	0.02	2	0.02	2	0.11	10	0.11	10	0.45	39.5	0.45	39.5	1.88	166	1.88	166
9/30/2007	0.003	0.36	0.003	0.36	0.06	5.5	0.06	5.5	0.22	19.1	0.22	19.1	0.87	76	0.87	76
10/31/2007	0.01	0.71	0.01	0.71	0.08	6.21	0.08	6.21	0.22	17.5	0.22	17.5	1.12	88	1.12	88
11/30/2007	0.01	0.43	0.01	0.43	0.06	4.28	0.06	4.23	0.17	12	0.17	12	1.01	71	1.01	71
12/31/2007	0.02	0.86	0.02	0.86	0.15	7.49	0.15	7.49	0.28	13.9	0.28	13.9	3.24	159	3.24	159
1/31/2008	0.03	1.56	0.03	1.56	0.21	11.61	0.21	11.61	0.14	7.88	0.14	7.88	4.62	254	4.62	254
2/29/2008	0.01	0.67	0.01	0.67	0.18	8.33	0.18	8.33	0.14	6.5	0.14	6.5	4.23	194	4.23	194
3/31/2008	0.04	1.09	0.04	1.09	0.19	5.77	0.19	5.77	0.45	13.7	0.45	13.7	8.06	244	8.06	244
4/30/2008	0.02	0.63	0.02	0.63	0.22	6.8	0.22	6.8	0.15	4.86	0.15	4.86	9.53	299	9.53	299
5/31/2008	0.06	1.44	0.06	1.44	0.13	3.42	0.13	3.42	0.22	5.77	0.22	5.77	17.13	447	17.13	447
6/30/2008	0.13	4.48	0.13	4.48	0.19	6.64	0.19	6.64	0.12	4.22	0.12	4.22	24.81	889	24.81	889
7/31/2008	0.03	2	0.03	2	0.07	4.29	0.07	4.29	0.08	5.3	0.08	5.3	4.59	298	4.59	298
8/31/2008	0.02	1.04	0.02	1.04	0.11	7.34	0.11	7.34	0.18	12.6	0.18	12.6	2.23	152	2.23	152
9/30/2008	0.01	0.54	0.01	0.54	0.05	3.53	0.05	3.53	0.07	5.49	0.07	5.49	1.28	97	1.28	97
10/31/2008	0.01	1.19	0.01	1.19	0.11	8.94	0.11	8.94	0.05	4.04	0.05	4.04	1.55	124	1.55	124
11/30/2008	0.01	0.35	0.01	0.35	0.08	5.74	0.08	5.74	0.1	7.2	0.1	7.2	1.21	86	1.21	86
12/31/2008	0.01	0.84	0.01	0.84	0.18	10.6	0.18	10.6	0.24	14.4	0.24	14.4	2.74	163	2.74	163
1/31/2009	0.03	1.25	0.03	1.25	0.36	14.9	0.36	14.9	0.41	16.8	0.41	16.8	7.58	311	7.58	311
2/28/2009	0.02	0.93	0.02	0.93	0.25	14.1	0.25	14.1	0.28	16.1	0.28	16.1	3.37	193	3.37	193
3/31/2009	0.04	1.16	0.04	1.16	0.41	12.5	0.41	12.5	0.74	22.4	0.74	22.4	8.23	249	8.23	249
4/30/2009	0.05	1.5	0.05	1.5	0.28	8.96	0.28	8.96	0.58	18.4	0.58	18.4	13.99	445	13.99	445
5/31/2009	0.03	0.99	0.03	0.99	0.11	4.23	0.11	4.23	0.32	12	0.32	12	10.14	380	10.14	380
6/30/2009	0.03	1.54	0.03	1.54	0.1	5.71	0.1	5.71	0.19	10.95	0.19	10.95	3.55	200	3.55	200
7/31/2009	0.01	0.99	0.01	0.99	0.11	8.71	0.11	8.71	0.15	12	0.15	12	1.82	141	1.82	141
8/31/2009	0.01	0.75	0.01	0.75	0.07	5.77	0.07	5.77	0.2	15.9	0.2	15.9	1.62	130	1.62	130
9/30/2009	0.002	0.24	0.002	0.24	0.06	4.7	0.06	4.7	0.2	17	0.2	17	0.67	57.4	0.67	57.4
10/31/2009	0.01	0.42	0.01	0.42	0.12	8.62	0.12	8.62	0.16	11.3	0.16	11.3	1.84	130	1.84	130
11/30/2009	0.01	0.46	0.01	0.46	0.16	11	0.16	11	0.21	14.5	0.21	14.5	2.03	142	2.03	142
12/31/2009	0.01	0.65	0.01	0.65	0.11	7.13	0.11	7.13	0.17	10.8	0.17	10.8	1.97	122	1.97	122
1/31/2010	0.01	0.63	0.01	0.63	0.13	7.96	0.13	7.96	0.35	20.9	0.35	20.9	2.51	151	2.51	151
2/28/2010	0.01	0.46	0.01	0.46	0.13	8.54	0.13	8.54	0.09	6.06	0.09	6.06	2.31	157	2.31	157
3/31/2010	0.005	0.322	0.005	0.322	0.14	9.26	0.14	9.26	0.1	6.89	0.1	6.89	2.53	169	2.53	169
4/30/2010	0.002	0.1	0.002	0.1	0.15	7.86	0.15	7.86	0.31	15.9	0.31	15.9	3.74	192	3.74	192
5/31/2010	0.03	1.29	0.03	1.29	0.2	9.67	0.2	9.67	0.23	10.9	0.23	10.9	4.05	193	4.05	193
6/30/2010	0.02	0.889	0.02	0.889	0.25	9.42	0.25	9.42	0.21	7.77	0.21	7.77	5.34	199	5.34	199
7/31/2010	0.02	1.65	0.02	1.65	0.13	8.94	0.13	8.94	0.16	11.3	0.16	11.3	3.31	250	3.61	250
8/31/2010	0.01	0.65	0.01	0.65	0.08	6.42	0.08	6.42	0.08	6.06	0.08	6.06	1.48	117	1.48	117
9/30/2010	0.01	0.505	0.01	0.505	0.1	7.51	0.1	7.51	0.13	10.2	0.13	10.2	1.7	132	1.7	132
10/31/2010	0.01	0.4	0.01	0.4	0.07	5.64	0.07	5.64	0.07	5	0.07	5	1.38	105	1.38	105
11/30/2010	0.001	0.1	0.001	0.1	0.07	4.38	0.07	4.38	0.03	1.94	0.03	1.94	1.46	91.5	1.46	91.5
12/31/2010	0.003	0.158	0.003	0.158	0.17	8.05	0.17	8.05	0.05	2.46	0.05	2.46	3.71	181	3.71	181
1/31/2011	0.007	0.238	0.007	0.238	0.42	13.9	0.42	13.9	0.26	8.77	0.26	8.77	7.37	244	7.37	244
2/28/2011	0.04	1.72	0.04	1.72	0.13	5.76	0.13	5.76	0.13	6.03	0.13	6.03	13.87	631	13.87	631
3/31/2011	0.01	0.463	0.01	0.463	0.18	5.88	0.18	5.88	0.21	6.76	0.21	6.76	4.49	146	4.49	146
4/30/2011	0.09	2.6	0.09	2.6	0.32	8.89	0.32	8.89	0.38	10.5	0.38	10.5	24.13	663	24.13	663
5/31/2011	0.0031	0.1	0.0031	0.1	0.15	4.91	0.15	4.91	0.0031	0.1	0.0031	0.1	7.83	253	7.83	253
6/30/2011	0.06	2.53	0.06	2.53	0.16	6.89	0.16	6.89	0.21	9.29	0.21	9.29	10.04	438	10.04	438
7/31/2011	0.01	1.08	0.01	1.08	0.05	3.92	0.05	3.92	0.05	3.82	0.05	3.82	2.09	151	2.09	151
Average	0.0	1.0	0.0	1.0	0.1	8.0	0.1	8.0	0.3	13.3	0.3	13.3	4.9	216.2	4.9	216.2
Minimum	0.001	0.1	0.001	0.1	0.05	3.42	0.05	3.42	0.0031	0.1	0.0031	0.1	0.04	3.7	0.04	3.7
Maximum	0.13	4.48	0.13	4.48	0.51	21.7	0.51	21.7	3.8	53.1	3.8	53.1	24.81	889	24.81	889
Count	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Std Dev	0.0	0.8	0.0	0.8	0.1	3.1	0.1	3.1	0.5	9.3	0.5	9.3	5.2	159.2	5.2	159.2
CV	1.142	0.79	1.149	0.785	0.637	0.39	0.637	0.394	1.807	0.70	1.807	0.701	1.059	0.74	1.061	0.736
95th Percentile	0.0785	2.6	0.0785	2.5895	0.354	13.7	0.354	13.735	0.6055	26.7	0.6055	26.655	13.9885	531	13.9885	531.05
5th Percentile	0.0	0.2	0.0	0.2	0.1	4.3	0.1	4.2	0.1	4.0	0.1	4.0	0.8	71.5	0.8	71.5
		since 8/09				since 8/09				since 8/09				since 8/09		
	Average	0.8				7.5				9.2				210.2		
	Minimum	0.1				3.92				0.1				57.4		
	Max	**2.6**				**13.9**				**20.9**				**663**		

Monitoring Location Desc	Upstream Monitoring	Upstream Monitoring	Upstream Monitoring	Upstream Monitoring	Downstream Monitoring	Downstream Monitoring	Downstream Monitoring
Parameter Desc	Chlorine, total residual	Copper, dissolved (as Cu)	Nitrogen, ammonia total (as N)	Phosphorus, total (as P)	Hardness, total (as CaCO3)	pH	Temperature, water deg. centigrade
Statistical Base Short Desc	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
Limit Unit Short Desc	mg/L	ug/L	mg/L	mg/L	mg/L	SU	deg C
Limits	**report**	**report**	**report**	**report**	**report**	**report**	**report**
8/31/2004							
9/30/2004							
10/31/2004							
11/30/2004							
12/31/2004							
1/31/2005							
2/28/2005							
3/31/2005							
4/30/2005							
5/31/2005							
6/30/2005							
7/31/2005	0.01	1	0.05	0.05	81.1	7.3	16
8/31/2005							
9/30/2005							
10/31/2005	0	1	0.01	0.039	104	7	10
11/30/2005							
12/31/2005							
1/31/2006							
2/28/2006							
3/31/2006							
4/30/2006							
5/31/2006							
6/30/2006							
7/31/2006	0.1	1	0.05	0.06	77.5	7	15
8/31/2006							
9/30/2006							
10/31/2006	0	1	0.0159	0.113	125	7.2	10
11/30/2006							
12/31/2006							
1/31/2007							
2/28/2007							
3/31/2007							
4/30/2007							9
5/31/2007							
6/30/2007							
7/31/2007							
8/31/2007	0.02	1	0.05	0.05	88.6	7.6	16
9/30/2007							
10/31/2007							
11/30/2007	0	1	0.5	0.05	117	7.1	8
12/31/2007							
1/31/2008							
2/29/2008							
3/31/2008							
4/30/2008							
5/31/2008							
6/30/2008							
7/31/2008							
8/31/2008							
9/30/2008	0.02	2.52	0.02	0.05	126	7.2	13.5
10/31/2008							
11/30/2008	0.02	1	0.05	0.05	117	7.5	5
12/31/2008							
1/31/2009							
2/28/2009							
3/31/2009							
4/30/2009							
5/31/2009							
6/30/2009							
7/31/2009							
8/31/2009							
9/30/2009	0.02	0.1	0.08	0.05	111	7.2	15.5
10/31/2009							
11/30/2009	0	0.1	0.05	0.05	146	7.2	6
12/31/2009							
1/31/2010							
2/28/2010							
3/31/2010							
4/30/2010							
5/31/2010							
6/30/2010							
7/31/2010							
8/31/2010	0.05	1.71	0.058	0.05	109	7	17
9/30/2010							
10/31/2010	0.02	1	0.009	0.05	132	7.3	8
11/30/2010							
12/31/2010							
1/31/2011							
2/28/2011							
3/31/2011							
4/30/2011							
5/31/2011							
6/30/2011							
7/31/2011							
Average	0.0	1.0	0.1	0.1	111.2	7.2	11.5
Minimum	0	0.1	0.009	0.039	77.5	7	5
Maximum	0.1	2.52	0.5	0.113	146	7.6	17
Count	12	12	12	12	12	12	13
Std Dev	0.0	0.7	0.1	0.0	21.3	0.2	4.2
CV	1.414	0.653	1.894	0.378	0.192	0.027	0.366
95th Percentile	0.0725	1.639	0.0778	0.08385	138.3	7.545	16.4
5th Percentile	0.0	0.100	0.0	0.0	79.5	7.0	

B. Organic and Hydraulic Loading to WWTP

Influent flow and loading has only slightly increased since issuance of the 2004 permit.



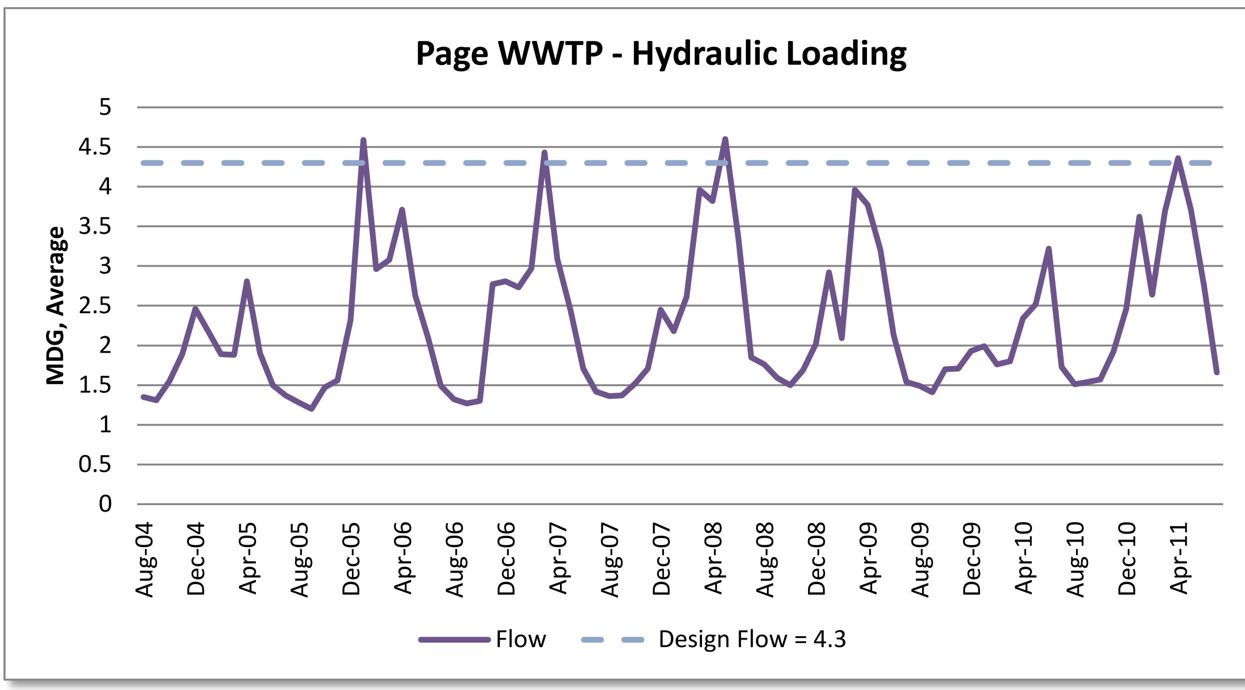


Figure 6. Page WWTP Average Monthly Influent Loading - 2004 to 2011

C. Effluent Metal Concentration

The following graphs are of the metals effluent data as submitted on the DMRs. Cadmium, Cooper and Zinc were only slightly changed over the period from 2004 to 2011. There has been a noticeable reduction in the concentration of lead during the period. Water quality-based effluent limits are achievable for both copper and lead.

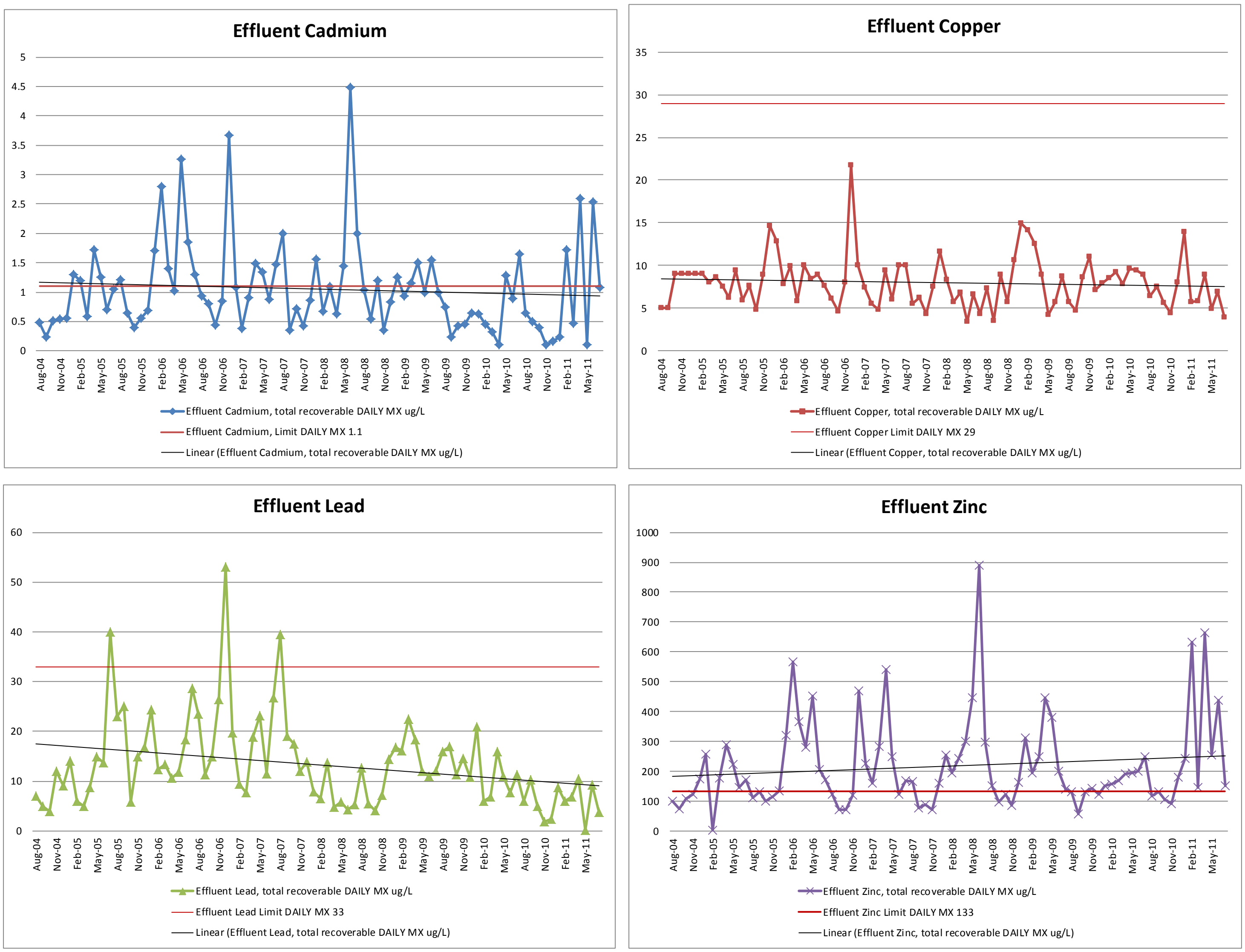


Figure 7. Cadmium, Copper, Lead, Zinc Effluent Concentrations

D. Effluent Data from Permit Application

The permit application data provided no additional data than was available in the discharge monitoring report summary, Appendix B.

Since the application was submitted in January 2009, additional data was reported in the monthly DMRs. DMR data as shown in Appendix B was used for evaluating reasonable potential and establishing permit limits. The calculated coefficient of variation (CV) and the 95th percentile was used in the reasonable potential analysis, Appendix D.

Appendix C: River Critical Design Flows

IDAPA 58.01.02.060 allows for mixing zones that utilizes up to 25% of the critical flow volumes. Further, IDAPA 58.01.02.210 requires that numeric standards be evaluated at the following low flow design discharge conditions:

Aquatic Life		Human Health	
CMC ("acute" criteria)	1Q10 or 1B3	Non-carcinogens	30Q5
CCC ("chronic" criteria)	7Q10 or 4B3	Carcinogens Harmonic	mean flow
Ammonia	30B3 or 30Q10		

Idaho's water quality standards suggest applying the following low flow conditions for surface water quality criteria.

1. The 1Q10 flow is used for the protection of aquatic life from acute effects. It represents the lowest one day flow with an average recurrence frequency of once in 10 years.
2. The 7Q10 flow is used for the protection of aquatic life from chronic effects. It represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.
3. The 30Q10 flow is used for the protection of aquatic life for the chronic ammonia criterion. It represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 10 years.
4. The 30Q5 flow is used for the protection of human health from non-carcinogens. It represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.
5. The harmonic mean flow is a long-term mean flow and is used for the protection of human health from carcinogens. It is the number of daily flow measurements divided by the sum of the reciprocals of the flows.

A. Receiving Water Quantity

The EPA determined critical design flows in the vicinity of the discharge considering stream flow data from the from the following U.S. Geological Survey (USGS) monitoring locations:

1. Upstream Site USGS 12413210 SF COEUR D ALENE AT ELIZABETH PARK NR KELLOGG ID
Latitude 47° 31'53", Longitude 116° 05'33"

2. Upstream Site USGS 12413300 SF COEUR D ALENE RIVER AT SMELTERVILLE ID
Latitude 47°32'54", Longitude 116°10'31"

3. Downstream Site: USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID
Latitude 47°33'07", Longitude 116°14'11"

Figure 8. River Flow Monitoring Stations in the Vicinity of the Outfall

Data from the upstream Smelterville monitoring site was used as the basis for critical flow data for the 2004 permit. Monitoring data for this location spans seven years, from 1966 through 1974. According to the previous fact sheet, the 1Q10 and 7Q10 were set as the lowest flow observed during the time period. The lowest flow during the period was 64 cfs which occurred December 8, 1972. This flow was used for both the 1Q10 and 7Q10 flows as the basis for evaluating reasonable potential and for establishing permit limits. For the proposed permit, the flow data at Smelterville was not considered further because the data is relatively old and of duration too short to establishing critical flows.

River flow data from both Pinehurst and Elizabeth Park were evaluated to establish critical rivers flows for the proposed permit. Limited instantaneous river flow data collected between January 8, 2002 and October 16, 2008 at Smelterville were used to establish a correlation between flows at both Elizabeth Park and Pinehurst. Flows at Smelterville were better correlated with flows at Elizabeth Park than with Pinehurst. Therefore, the Elizabeth Park gauge was used to establish critical river flows in the vicinity of the discharge for this permit.

The Elizabeth Park monitoring location has daily flow beginning in 1987 through the present. The following graph shows the average monthly flows during the period from 1987 through 2011. As indicated the low flow period for establish effluent limitations is July through December.

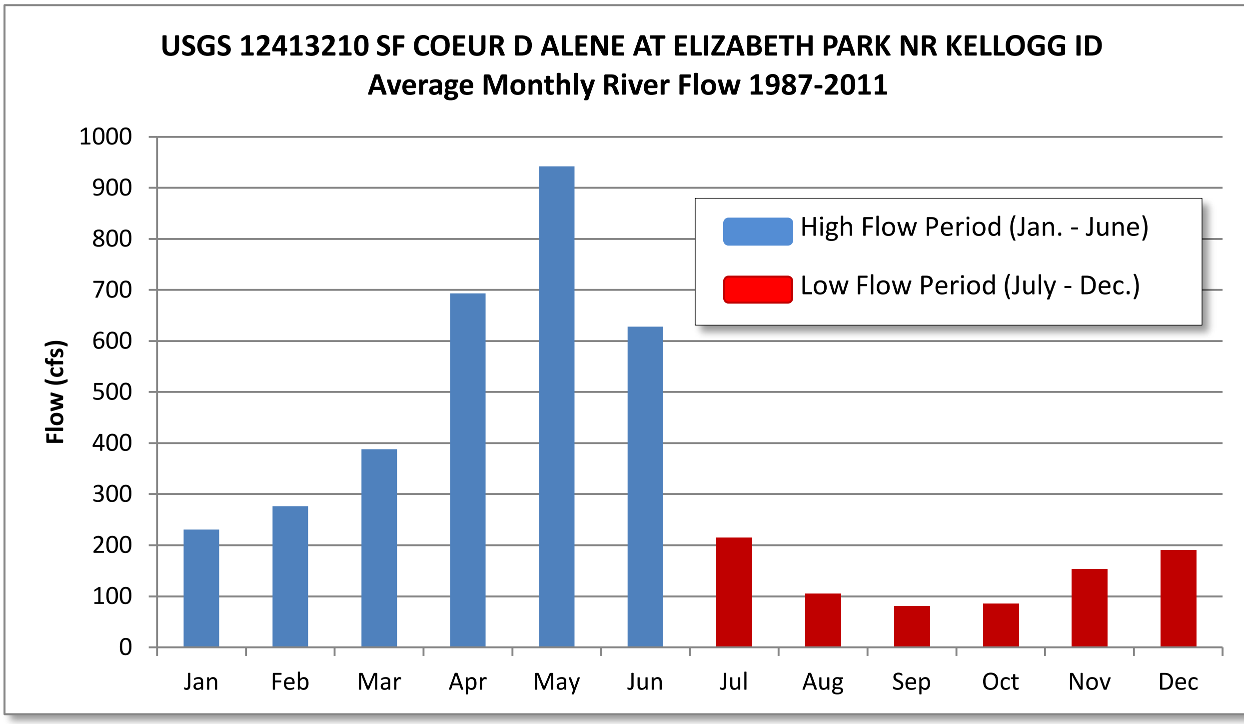
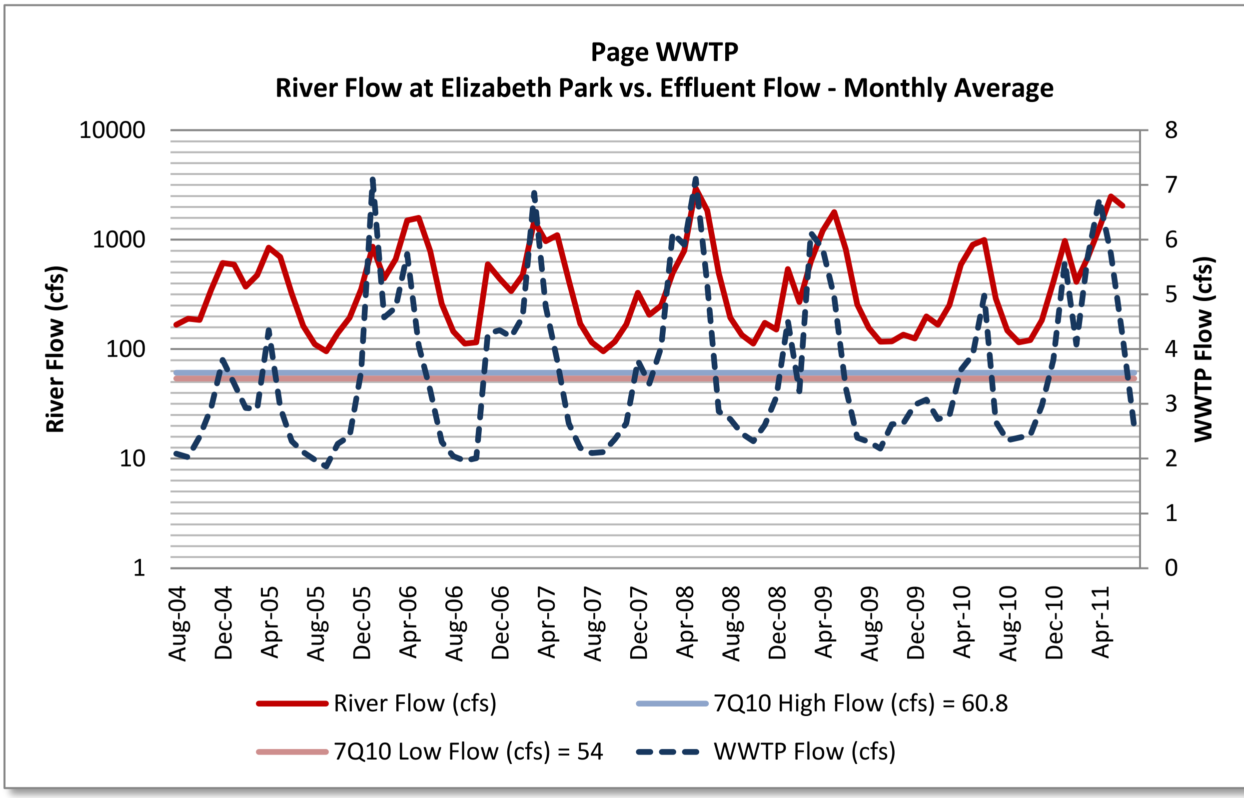


Figure 9. SF Coeur d'Alene River Flow – Seasonal Variation

The following graph shows the critical river flows based on the Elizabeth Park gauge as compared to river and WWTP effluent flows. As shown, both the river flow and WWTP flows have a similar seasonal pattern influenced by wet periods. The WWTP is highly influenced by inflows and infiltration of groundwater into their collection system.



Note: critical flows are based on a longer time period of 25 years than presented in this graph.

Figure 10. SF Coeur d'Alene River vs. WWTP (average monthly basis)

The critical design flows were calculated using the EPA's dFlow[1] program for flows at Elizabeth Park using approximately 24 years of daily flow data.

Table 16. Critical Design Flows – South Fork Coeur d'Alene River at Elizabeth Park

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	40.4	**46.8**	**42.2**
7Q10	51	**58.8**	**52.4**
30Q10	57.1	**71.9**	**56.6**
30Q5	59.3	**91.4**	**61.1**
Harmonic Mean	143	**143**	**141**

A correlation between the daily river flow data at Elizabeth Park and the limited instantaneous flow data at the Smelterville gauge was established using the Excel® workbook based on an established method.[2] The Smelterville river flow data is presented in Table 21. The following graph shows the river flow at both Elizabeth Park and at Smelterville during the period of time for which overlapping flow data was

[1] Water Quality Models and Tools – DFLOW (http://water.epa.gov/scitech/datait/models/dflow/index.cfm)

[2] Hirsch, R. A Comparison of Four Stream flow Record Extension Techniques. Water Resources Research. Vol. 18, No. 4, Pages 1081-1088. August 1982.

available. It is followed by a graph of the best fit line for the measured flow at Smelterville as compared to the predicated flow based on the established correction.

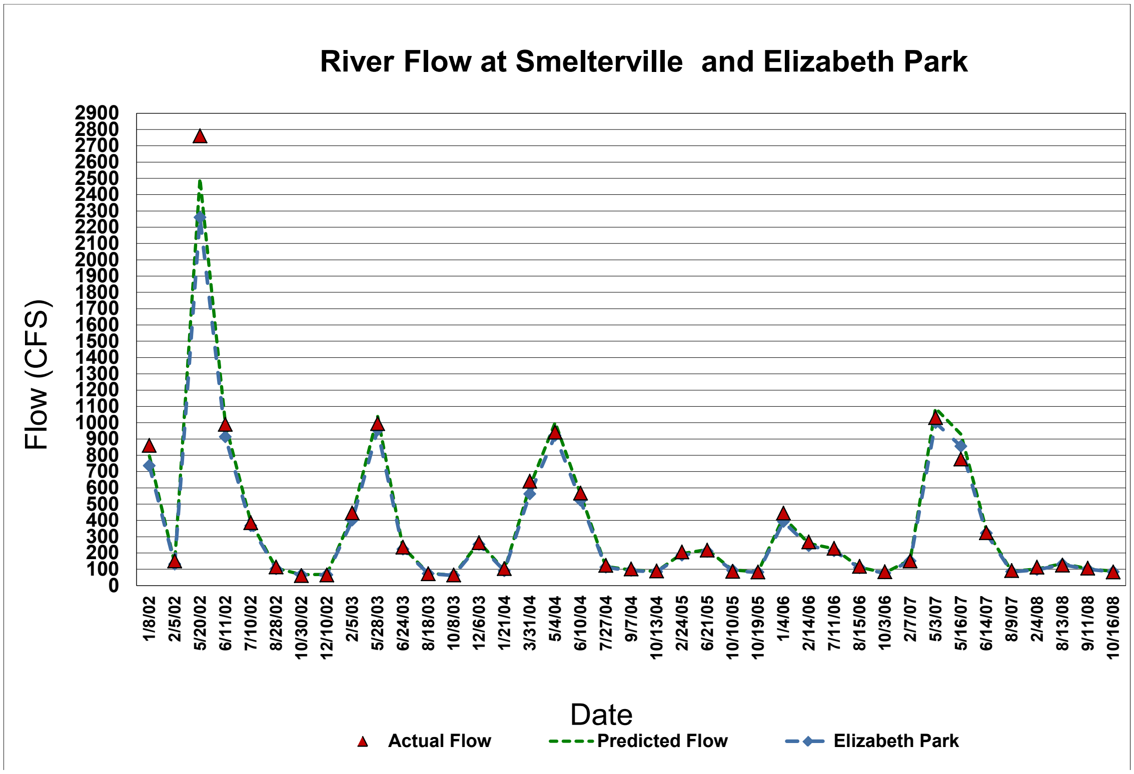


Figure 11. River Flow at Smelterville and Elizabeth Park

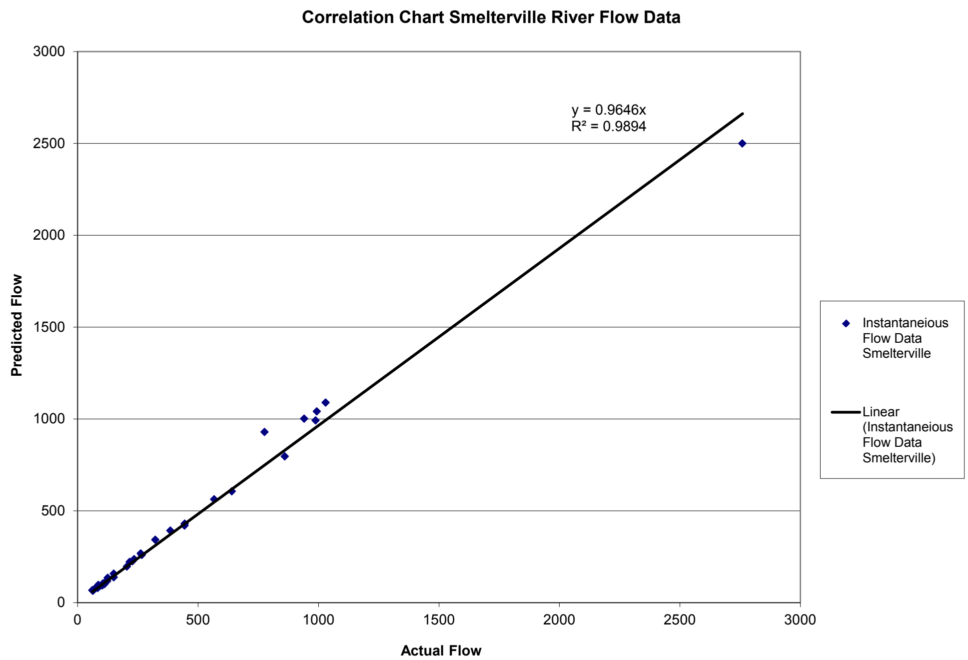


Figure 12. Correlation Chart for Actual vs. Predicated River Flow at Smelterville

The above correlation was used to estimate critical river flows at Smelterville based on the critical river flows at Elizabeth Park, Table 15. These critical river flows will be used to develop water quality-based effluent limits.

Table 17. Critical River Flows at Smelterville

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	41.5	48.2	**43.3**
7Q10	52.6	60.8	**54.0**
30Q10	59.0	74.6	**58.4**
30Q5	61.3	95.2	**63.2**
Harmonic Mean	150.2	150.2	**148.1**

B. Mixing Zone and Dilution Factors

A mixing zone is an area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where the water quality standards may be exceeded as long as acutely toxic conditions are prevented (U.S. EPA NPDES Permit Writers' Manual, 2010[3]). 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 Idaho Department of Environmental Quality (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.

Dilution Factor $$DF = \frac{Q_d + Q_{critical\ flow} \times (\text{percentage of river allowble for mixing})}{Q_d}$$

Where Q_d = WWTP discharge flow (cfs); $Q_{critical\ flow}$ = applicable critical river flow (cfs)

Dilution factor is calculated based on the design flow.

The City of Smelterville WWTP discharges near the Page WWTP outfall such that the mixing zones overlap. The Smelterville outfall discharges approximately 10 feet upstream of the Page outfall. For the purposes of establishing a dilution factor, these two discharges will be permitted with a single shared mixing zone. Concentrations limits will be set to ensure that the water quality standards are not exceed at the edge of the shared mixing zone. The mass loading limits will be allocated based on plant flow.

Idaho's water quality standards address allowable mixing zones for adjacent outfalls. This portion of the rule applies to overlapping discharges. Single mixing zones are allowed 25% of the width and volume. The rule is specific with regard to size criteria for adjacent mixing zone, but silent on the river flow criteria. In their draft 401 Certification, the IDEQ proposes to authorize a mixing zone of 50% of the

[3] http://www.epa.gov/npdes/pubs/pwm_2010.pdf, p. 6-20.

river flow for ammonia and chlorine for the two facilities. The EPA used this mixing zone in its reasonable potential analysis and calcution of water quality-based effluent limits.

Excerpt IDAPA 58.01.02.060

e. Mixing zones in flowing receiving waters are to be limited to the following: (7-1-93)

i. *The cumulative width of adjacent mixing zones when measured across the receiving water is not to exceed fifty percent (50%) of the total width of the receiving water at that point; (7-1-93)*

ii. The width of a mixing zone is not to exceed twenty-five percent (25%) of the stream width or three hundred (300) meters plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less; (7-1-93)

iii. The mixing zone is to be no closer to the ten (10) year, seven (7) day low-flow shoreline than fifteen percent (15%) of the stream width; (7-1-93)

iv. The mixing zone is not to include more than twenty-five percent (25%) of the volume of the stream flow; (7-1-9)

The following combined dilution factors will be used to establish limits for ammonia, chlorine and pH for both Page and Smelterville WWTPs.

Table 18. Dilution Factors – Low Season Critical River Flows – July – December

Plant Data	Units	Design Flow	
Design Flow	mgd	4.55	4.3 MDG Page, 0.25 MGD Smelterville
Design Flow	cfs - calculated	7.0	
BOD_5	lb/day		
TSS	lb/day		

Low Flow (July -December)

Estimated Critical Design Flows USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID

Critical Flow Parameter		Used for evaluating criteria for:
1Q10	43.3	Aquatic Life Uses - Acute
7Q10	54	Aquatic Life Uses - Chronic
30Q10	58.4	Ammonia
30Q5	63.2	Human Health – Non-carninogen
Harmonic Mean	148.1	Human Health – Carcinogen

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	50%	4.1	1Q10	
DF-edge of Chronic zone	50%	4.8	7Q10	34%
Ammonia	50%	5.1	30Q10	
HH-Non-Carcinogen	50%	5.5	30Q5	
HH-Carcinogen	50%	11.5	Harmonic Mean	

Table 19. Dilution Factors – High Season Critical River Flows – January – June

High Flow (January-June)

Estimated Critical Design Flows USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID

Critical Flow Parameter		Used for evaluating criteria for:
1Q10	48.2	Aquatic Life Uses - Acute
7Q10	60.8	Aquatic Life Uses - Chronic
30Q10	74.6	Ammonia
30Q5	95.2	Human Health – Non-carninogen
Harmonic Mean	150.2	Human Health – Carcinogen

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	50%	4.4	1Q10	
DF-edge of Chronic zone	50%	5.3	7Q10	32%
Ammonia	50%	6.3	30Q10	
HH-Non-Carcinogen	50%	7.8	30Q5	
HH-Carcinogen	50%	11.7	Harmonic Mean	

Table 20. Dilution Factors Yearly Critical River Flows

Annual Flows (April - March)		
Estimated Critical Design Flows USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID		
Critical Flow Parameter		**Used for evaluating criteria for:**
1Q10	41.5	**Aquatic Life Uses - Acute**
7Q10	52.6	**Aquatic Life Uses - Chronic**
30B3	59	**Ammonia**
30Q5	61.3	**Human Health – Non-carninogen**
Harmonic Mean	150.2	**Human Health – Carcinogen**

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	**50%**	**3.9**	**1Q10**	
DF-edge of Chronic zone	**50%**	**4.7**	**7Q10**	**35%**
Ammonia	**50%**	**5.2**	**30B3**	
HH-Non-Carcinogen	**50%**	**5.4**	**30Q5**	
HH-Carcinogen	**50%**	**11.7**	**Harmonic Mean**	

C. Receiving Water Quality

Receiving water quality is used to evaluate the overall impact of the discharge on receiving water. Both USGS monitoring sites included some receiving water data. Where pollutant data were available, data provided by the permittee at a sample point just upstream of the discharge was used to characterize the receiving water upstream of the point of discharge. The tables below summarize the receiving water data used to evaluate the reasonable potential of the discharge to contribute to violations of the WQS.

Table 21: Receiving Water Quality USGS Smelterville Gauge (2004 to Present)

Statistical Data	Temperature, water, degrees Celsius	pH, water, unfiltered, field, standard units	Ammonia, water, filtered, milligrams per liter as nitrogen	Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	Phosphorus, water, unfiltered, milligrams per liter as phosphorus	Phosphorus, water, filtered, milligrams per liter as phosphorus	Hardness, water, milligrams per liter as calcium carbonate	Cadmium, water, filtered, micrograms per liter	Cadmium, water, unfiltered, micrograms per liter	Lead, water, filtered, micrograms per liter	Lead, water, unfiltered, recoverable, micrograms per liter	Zinc, water, filtered, micrograms per liter	Zinc, water, unfiltered, recoverable, micrograms per liter
1/21/2004	4	7.1	0.016	0.214	0.027	0.013	182	13.3	13.1	3.34	8.88	1470	1500
3/31/2004	6.2	7.4	< 0.010	0.075	0.018	0.005	46.2	4.72	5.32	4.88	44.8	713	795
5/4/2004	8.8	7.3	< 0.010	0.029	0.012	E 0.003	29.9	2.44	2.81	2.56	38.1	394	415
6/10/2004	9.1	7.3	< 0.010	0.049	0.011	0.005	43.4	4.09	4.08	3.33	8.97	620	583
7/27/2004	17.4	7.5	< 0.010	0.058	0.021	0.013	91.7	7.66	7.49	5.83	9.43	1110	1040
9/7/2004	14.3	7.4	E 0.006	0.074	0.023	0.012	87.7	9.13	9.28	4.78	10.2	1200	1180
10/13/2004	9.3	7.2	E 0.005	0.116	0.027	0.01	122	10.4	10.3	3.58	10	1230	1260
12/12/2004	3.4	6.7	< 0.010	0.12	0.022	0.007	35.5	4.38	5	1.89	45.5	519	575
2/24/2005	4.2	6.9	E 0.006	0.127	0.014	0.01	80.1	5.76	5.92	3.43	6.88	886	905
3/29/2005	4.2	7.3	E 0.005	0.123	0.016	0.005	47.5	6.59	6.09	2.19	16.9	670	687
5/17/2005	7.7	7.7	E 0.005	0.037	0.013	0.011	40.7	2.75	3.16	2.41	15.1	486	429
6/21/2005	14.8	7.5	E 0.007	0.064	0.019	0.011	77.4	6.38	6.28	3.75	8.43	885	826
8/10/2005	18.4	7.6	E 0.005	0.056	0.034	0.011	100	7.54	7.9	5.06	13.9	856	936
10/19/2005	9.3	7.3	E 0.006	0.11	0.022	0.013	108	9.58	9.39	3.42	7.95	1320	1350
1/4/2006	5.1	7.3	E 0.007	0.19	0.013	0.009	73	9.54	9.54	2.77	9.87	995	1100
2/14/2006	3.4	7.2	< 0.010	0.036	< 0.004	E 0.003	90.6	8.82	8.6	2.86	7.72	1260	1210
4/6/2006	5.5	7.2	E 0.006	0.083	0.055	0.006	46.1	4.24	5.86	2.33	107	685	752
5/17/2006	10.9	7.4	< 0.010	0.028	0.087	0.005	23.3	1.6	5.07	3.77	279	240	615
6/13/2006	11.6	6.8	E 0.007	< 0.016	0.01	0.006	44.6	3.33	3.35	2.74	9.18	490	478
7/11/2006	19.3	6.9	E 0.005	0.022	0.018	0.01	79.8	5.83	6.01	4.58	10.2	846	768
8/15/2006	16.2	6.8	0.014	0.07	0.026	0.015	109	7.5	8.05	3.84	7.97	1140	1160
10/3/2006	12.1	7.8	< 0.020	0.075	0.026	0.015	126	7.9	8.33	4.49	8.95	1120	1150
11/8/2006	7.3	7.1	< 0.020	0.144	0.02	E 0.007	43.4	5.49	5.7	2.76	23.6	787	786
2/7/2007	3.8	7.3	E 0.011	0.121	0.02	0.013	89.5	7.59	6.67	3.97	7.5	1130	989
3/12/2007	5.7	7.1	< 0.020	0.117	0.183	E 0.007	175	3.24	7.76	1.13	282	431	881
5/3/2007	5.7	7.5	< 0.020	0.033	0.012	E 0.005	32.6	2.28	2.34	2.34	19	360	360
6/14/2007	9.6	7.1	< 0.020	0.052	0.013	E 0.007	112	4.28	3.94	3.31	6.69	671	597
8/9/2007	17	7.1	< 0.020	0.089	0.027	0.014	95.7	7.84	7.13	4.39	9.34	1180	1040
10/16/2007	9.6	7.4	E 0.015	0.144	0.028	0.017	125	9.33	8.7	5.67	16	1410	1240
12/4/2007	4	7.3	E 0.014	0.26	0.05	E 0.007	59.6	9.27	11.1	1.57	72.3	938	1030
2/4/2008	2.8	7.3	E 0.015	0.285	0.022	0.019	118	8.6	8.45	3.71	6.31	1240	1140
5/6/2008	7.7	7.2	< 0.020	0.086	0.049	E 0.005	38.1	3.04	5.02	2.24	166	515	661
5/18/2008	6	7	< 0.020	0.061	0.31	E 0.007	21.8	1.22	11.5	6.18	1960	217	1820
6/25/2008	10.8	7.5	< 0.020	0.021	0.01	E 0.005	32.6	2.71	2.99	4.94	25.5	407	408
8/13/2008	16	7.4	< 0.020	0.113	0.025	0.017	120	8.81	8.15	7.22	11.6	1180	1110
9/11/2008	14.1	7.5	E 0.018	0.149	0.03	0.021	126	11.3	10.3	6.92	12.4	1440	1350
10/16/2008	6.8	7.3	< 0.020	0.197	0.032	0.021	103	11.6	11	5.44	10.7	1670	1480
11/13/2008	6.8	7.2	< 0.020	0.177	0.082	0.01	65.9	5.69	7.96	4.25	151	848	1000
1/8/2009	2.1	6.7	0.02	0.148	0.142	0.01	35.2	3.52	6.89	1.81	256	399	665
2/24/2009	3.2	6.5	E 0.011	0.243	0.038	0.015	78.2	8.34	7.91	2.82	20.1	1040	974
5/19/2009	6.2	6.6	< 0.020	0.043	0.065	E 0.005	25.7	1.99	3.8	3.61	259	332	511
6/17/2009	11.5	7.1	< 0.020	0.033	0.013	0.009	43.2	3.89	3.89	4.82	10.6	573	521
8/4/2009	19.8	7.6	< 0.020	0.108	0.029	0.016	104	8.04	8.06	4.45	9.87	966	947
10/20/2009	9.7	7.2	E 0.010	0.092	0.058	0.023	154	12.2	11.3	4.11	16.2	1540	1420
3/30/2010	4.7	7.3	< 0.020	0.199	0.03	0.01	50.3	5.54	5.76	2.15	46.1	653	629
4/21/2010	7.6	6.9	< 0.020	0.082	0.042	E 0.007	32.8	3.11	4.04	1.97	98.9	467	529
7/8/2010	12.8	7.5	< 0.020	0.079	0.017	0.011	64.1	6.44	5.74	3.71	8.02	982	815
10/6/2010	13.7	7.5	< 0.010	0.1	0.045	0.015	112	10.1	10.3	2.67	11.7	1320	1260
1/15/2011	4.3	7.5	< 0.010	0.153	0.021	0.009	44.6	4.25	4.41	1.72	21.1	573	484
6/7/2011	6.8	6.4	< 0.010	0.026	0.164	0.007	27.3	2.07	74.2	1.78	351	295	4900
7/12/2011	12.3	7.4	< 0.010	0.012	0.019	0.007	45.2	3.42	8.58	3.44	24.4	440	726
Count	51	51	3	50	50	39	51	51	51	51	51	51	51
Min	2.1	6.4	0.014	0.012	0.01	0.005	21.8	1.22	2.34	1.13	6.31	217	360
Max	19.8	7.8	0.02	0.285	0.31	0.023	182	13.3	74.2	7.22	1960	1670	4900
Ave	9.09	7.22	0.02	0.10	0.04	0.01	75.67	6.25	8.32	3.59	90.15	845.86	980.14
Std. Dev.	4.81	0.31	0.00	0.07	0.05	0.00	40.64	3.10	9.76	1.40	280.40	383.99	652.48
CV	0.53	0.04	0.18	0.64	1.26	0.40	0.54	0.50	1.17	0.39	3.11	0.45	0.67
95th Percentile	**17.90**	**7.60**	0.0196	0.22995	0.1541	0.021	140	11.45	11.4	6.005	280.5	1455	1490
5 Percentile	3.3	6.65	0.0142	0.0238	0.01145	0.005	**27**	2.03	3.075	1.75	7.19	313.5	422

Receiving Water Quality USGS Smelterville Gauge (2004 to Present) – High Flow

Statistical Data	Temperature, water, degrees Celsius	pH, water, unfiltered, field, standard units	Ammonia, water, filtered, milligrams per liter as nitrogen	Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	Phosphorus, water, unfiltered, milligrams per liter as phosphorus	Phosphorus, water, filtered, milligrams per liter as phosphorus	Hardness, water, milligrams per liter as calcium carbonate	Cadmium, water, filtered, micrograms per liter	Cadmium, water, unfiltered, micrograms per liter	Lead, water, filtered, micrograms per liter	Lead, water, unfiltered, recoverable, micrograms per liter	Zinc, water, filtered, micrograms per liter	Zinc, water, unfiltered, recoverable, micrograms per liter
1/21/2004	4	7.1	0.016	0.214	0.027	0.013	182	13.3	13.1	3.34	8.88	1470	1500
3/31/2004	6.2	7.4	< 0.010	0.075	0.018	0.005	46.2	4.72	5.32	4.88	44.8	713	795
5/4/2004	8.8	7.3	< 0.010	0.029	0.012	E 0.003	29.9	2.44	2.81	2.56	38.1	394	415
12/12/2004	3.4	6.7	< 0.010	0.12	0.022	0.007	35.5	4.38	5	1.89	45.5	519	575
2/24/2005	4.2	6.9	E 0.006	0.127	0.014	0.01	80.1	5.76	5.92	3.43	6.88	886	905
3/29/2005	4.2	7.3	E 0.005	0.123	0.016	0.005	47.5	6.59	6.09	2.19	16.9	670	687
5/17/2005	7.7	7.7	E 0.005	0.037	0.013	0.011	40.7	2.75	3.16	2.41	15.1	486	429
1/4/2006	5.1	7.3	E 0.007	0.19	0.013	0.009	73	9.54	9.54	2.77	9.87	995	1100
2/14/2006	3.4	7.2	< 0.010	0.036	< 0.004	E 0.003	90.6	8.82	8.6	2.86	7.72	1260	1210
4/6/2006	5.5	7.2	E 0.006	0.083	0.055	0.006	46.1	4.24	5.86	2.33	107	685	752
5/17/2006	10.9	7.4	< 0.010	0.028	0.087	0.005	23.3	1.6	5.07	3.77	279	240	615
2/7/2007	3.8	7.3	E 0.011	0.121	0.02	0.013	89.5	7.59	6.67	3.97	7.5	1130	989
3/12/2007	5.7	7.1	< 0.020	0.117	0.183	E 0.007	175	3.24	7.76	1.13	282	431	881
5/3/2007	5.7	7.5	< 0.020	0.033	0.012	E 0.005	32.6	2.28	2.34	2.34	19	360	360
12/4/2007	4	7.3	E 0.014	0.26	0.05	E 0.007	59.6	9.27	11.1	1.57	72.3	938	1030
2/4/2008	2.8	7.3	E 0.015	0.285	0.022	0.019	118	8.6	8.45	3.71	6.31	1240	1140
5/6/2008	7.7	7.2	< 0.020	0.086	0.049	E 0.005	38.1	3.04	5.02	2.24	166	515	661
5/18/2008	6	7	< 0.020	0.061	0.31	E 0.007	21.8	1.22	11.5	6.18	1960	217	1820
1/8/2009	2.1	6.7	0.02	0.148	0.142	0.01	35.2	3.52	6.89	1.81	256	399	665
2/24/2009	3.2	6.5	E 0.011	0.243	0.038	0.015	78.2	8.34	7.91	2.82	20.1	1040	974
5/19/2009	6.2	6.6	< 0.020	0.043	0.065	E 0.005	25.7	1.99	3.8	3.61	259	332	511
3/30/2010	4.7	7.3	< 0.020	0.199	0.03	0.01	50.3	5.54	5.76	2.15	46.1	653	629
4/21/2010	7.6	6.9	< 0.020	0.082	0.042	E 0.007	32.8	3.11	4.04	1.97	98.9	467	529
1/15/2011	4.3	7.5	< 0.010	0.153	0.021	0.009	44.6	4.25	4.41	1.72	21.1	573	484
Count	24	24	2	24	23	15	24	24	24	24	24	24	24
Min	2.1	6.5	0.016	0.028	0.012	0.005	21.8	1.22	2.34	1.13	6.31	217	360
Max	10.9	7.7	0.02	0.285	0.31	0.019	182	13.3	13.1	6.18	1960	1470	1820
Ave	5.30	7.15	0.02	0.12	0.05	0.01	62.35	5.26	6.51	2.82	158.09	692.21	819.00
Std. Dev.	2.09	0.30	0.00	0.08	0.07	0.00	43.42	3.12	2.80	1.14	395.38	349.82	357.22
CV	0.39	0.04	0.16	0.64	1.28	0.41	0.70	0.59	0.43	0.40	2.50	0.51	0.44
95th Percentile	**8.64**	**7.50**	**0.0198**	**0.25745**	**0.1789**	**0.0162**	166.45	**9.4995**	**11.44**	**4.7435**	**281.55**	**1257**	**1456.5**
5 Percentile	2.86	6.615	0.0162	0.0296	0.0121	0.005	**23.66**	1.6585	2.8625	1.5925	6.973	253.8	417.1

Receiving Water Quality USGS Smelterville Gauge (2004 to Present) – Low Flow

Statistical Data	Temperature, water, degrees Celsius	pH, water, unfiltered, field, standard units	Ammonia, water, filtered, milligrams per liter as nitrogen	Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	Phosphorus, water, unfiltered, milligrams per liter as phosphorus	Phosphorus, water, filtered, milligrams per liter as phosphorus	Hardness, water, milligrams per liter as calcium carbonate	Cadmium, water, filtered, micrograms per liter	Cadmium, water, unfiltered, micrograms per liter	Lead, water, filtered, micrograms per liter	Lead, water, unfiltered, recoverable, micrograms per liter	Zinc, water, filtered, micrograms per liter	Zinc, water, unfiltered, recoverable, micrograms per liter
6/10/2004	9.1	7.3	< 0.010	0.049	0.011	0.005	43.4	4.09	4.08	3.33	8.97	620	583
7/27/2004	17.4	7.5	< 0.010	0.058	0.021	0.013	91.7	7.66	7.49	5.83	9.43	1110	1040
9/7/2004	14.3	7.4	E 0.006	0.074	0.023	0.012	87.7	9.13	9.28	4.78	10.2	1200	1180
10/13/2004	9.3	7.2	E 0.005	0.116	0.027	0.01	122	10.4	10.3	3.58	10	1230	1260
6/21/2005	14.8	7.5	E 0.007	0.064	0.019	0.011	77.4	6.38	6.28	3.75	8.43	885	826
8/10/2005	18.4	7.6	E 0.005	0.056	0.034	0.011	100	7.54	7.9	5.06	13.9	856	936
10/19/2005	9.3	7.3	E 0.006	0.11	0.022	0.013	108	9.58	9.39	3.42	7.95	1320	1350
6/13/2006	11.6	6.8	E 0.007	< 0.016	0.01	0.006	44.6	3.33	3.35	2.74	9.18	490	478
7/11/2006	19.3	6.9	E 0.005	0.022	0.018	0.01	79.8	5.83	6.01	4.58	10.2	846	768
8/15/2006	16.2	6.8	0.014	0.07	0.026	0.015	109	7.5	8.05	3.84	7.97	1140	1160
10/3/2006	12.1	7.8	< 0.020	0.075	0.026	0.015	126	7.9	8.33	4.49	8.95	1120	1150
11/8/2006	7.3	7.1	< 0.020	0.144	0.02	E 0.007	43.4	5.49	5.7	2.76	23.6	787	786
6/14/2007	9.6	7.1	< 0.020	0.052	0.013	E 0.007	112	4.28	3.94	3.31	6.69	671	597
8/9/2007	17	7.1	< 0.020	0.089	0.027	0.014	95.7	7.84	7.13	4.39	9.34	1180	1040
10/16/2007	9.6	7.4	E 0.015	0.144	0.028	0.017	125	9.33	8.7	5.67	16	1410	1240
6/25/2008	10.8	7.5	< 0.020	0.021	0.01	E 0.005	32.6	2.71	2.99	4.94	25.5	407	408
8/13/2008	16	7.4	< 0.020	0.113	0.025	0.017	120	8.81	8.15	7.22	11.6	1180	1110
9/11/2008	14.1	7.5	E 0.018	0.149	0.03	0.021	126	11.3	10.3	6.92	12.4	1440	1350
10/16/2008	6.8	7.3	< 0.020	0.197	0.032	0.021	103	11.6	11	5.44	10.7	1670	1480
11/13/2008	6.8	7.2	< 0.020	0.177	0.082	0.01	65.9	5.69	7.96	4.25	151	848	1000
6/17/2009	11.5	7.1	< 0.020	0.033	0.013	0.009	43.2	3.89	3.89	4.82	10.6	573	521
8/4/2009	19.8	7.6	< 0.020	0.108	0.029	0.016	104	8.04	8.06	4.45	9.87	966	947
10/20/2009	9.7	7.2	E 0.010	0.092	0.058	0.023	154	12.2	11.3	4.11	16.2	1540	1420
7/8/2010	12.8	7.5	< 0.020	0.079	0.017	0.011	64.1	6.44	5.74	3.71	8.02	982	815
10/6/2010	13.7	7.5	< 0.010	0.1	0.045	0.015	112	10.1	10.3	2.67	11.7	1320	1260
6/7/2011	6.8	6.4	< 0.010	0.026	0.164	0.007	27.3	2.07	74.2	1.78	351	295	4900
7/12/2011	12.3	7.4	< 0.010	0.012	0.019	0.007	45.2	3.42	8.58	3.44	24.4	440	726
Count	27	27	1	26	27	24	27	27	27	27	27	27	27
Min	6.8	6.4	0.014	0.012	0.01	0.005	27.3	2.07	2.99	1.78	6.69	295	408
Max	19.8	7.8	0.014	0.197	0.164	0.023	154	12.2	74.2	7.22	351	1670	4900
Ave	12.46	7.27	0.01	0.09	0.03	0.01	87.52	7.13	9.94	4.27	29.77	982.44	1123.37
Std. Dev.	3.94	0.30	#DIV/0!	0.05	0.03	0.00	34.63	2.85	13.06	1.26	69.72	366.24	812.74
CV	0.32	0.04	#DIV/0!	0.57	0.97	0.37	0.40	0.40	1.31	0.29	2.34	0.37	0.72
95th Percentile	**19.03**	**7.60**	**0.01**	**0.17**	**0.07**	**0.02**	126.00	**11.51**	**11.21**	**6.59**	**113.35**	**1510.00**	**1462.00**
5 Percentile	6.8	6.8	0.014	0.02125	0.0103	0.00615	**35.8**	2.896	3.512	2.691	7.956	416.9	490.9

The following graphs were generated using USGS gauge at Smelterville for the upstream data, the USGS gauge at Pinehurst for the downstream data and the DMR for the WWTP effluent data (2004 through 2011). These graphs depict the small contribution that the WWTP makes to overall concentrations of metals in the river water over time.

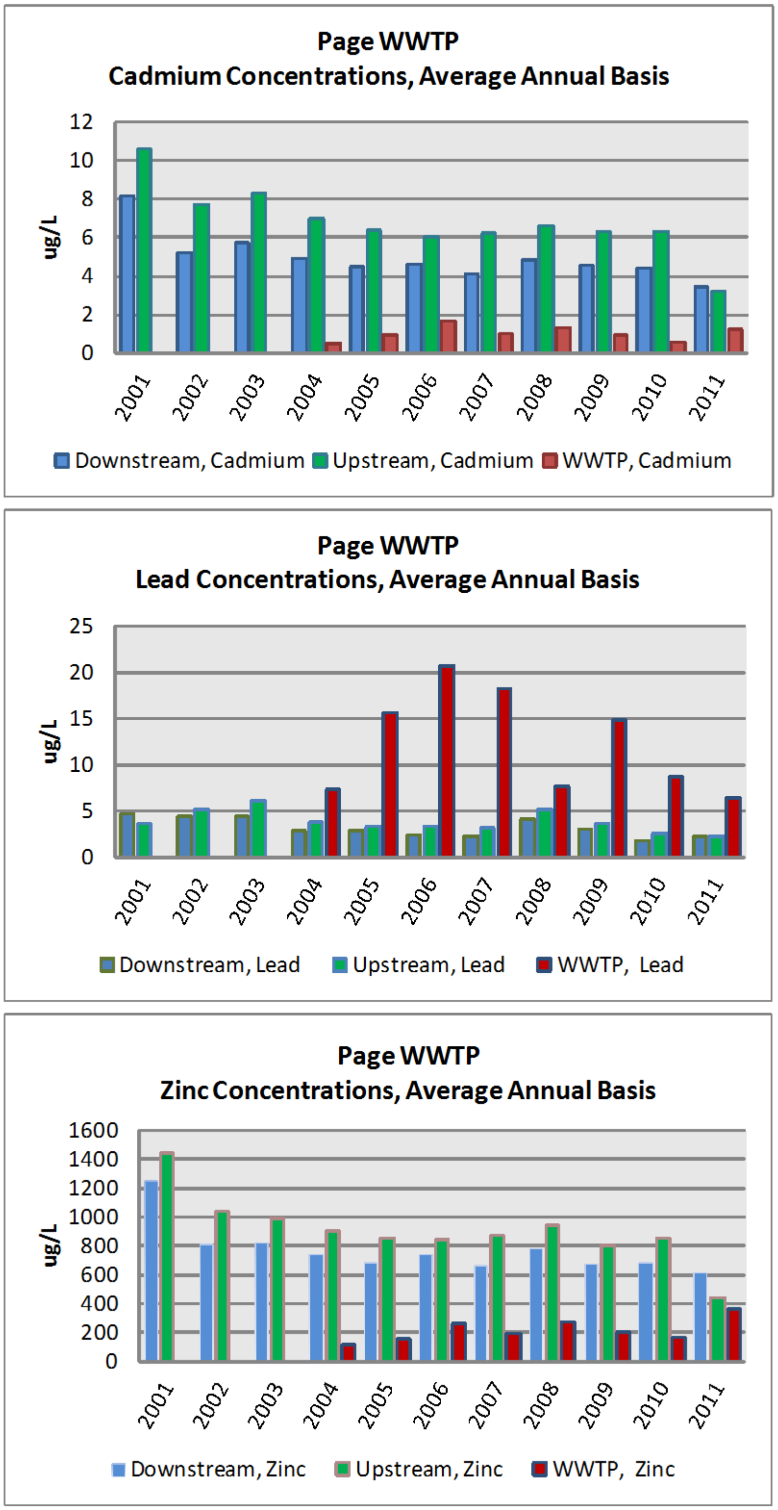


Figure 13. Comparison of Concentration of Metals in SFCDA River

Appendix D: Basis for Effluent Limits

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

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits for BOD_5, TSS and pH

The CWA requires POTWs to meet 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. 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 below.

Table 22. Secondary Treatment Effluent Limits (40 CFR § 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
Biochemical Oxygen Demand (BOD_5)	30 mg/L	45 mg/L	---
Total Suspended Solids (TSS)	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

Chlorine

The Page 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. The AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for chlorine of 0.75 mg/L.

EPA has determined that the technology-based effluent limit for chlorine is not sufficiently stringent to meet water quality standards. Refer to discussion on water quality-based effluent limits below.

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[10]

Following are the mass-based effluent limits for the technology-based effluent limits for BOD_5 and TSS.

Table 23. Mass-Based Effluent for BOD_5 and TSS

Parameter	Average Monthly Limit (lb/day)	Average Weekly Limit (lb/day)
Biochemical Oxygen Demand (BOD_5)	30 mg/L x 4.3 mgd x 8.34 = 1076 Round to 1,100	45 mg/L x 4.3 mdg x 8.34 = 1614 Round to 1,600
Total Suspended Solids (TSS)	30 mg/L x 4.3 mgd x 8.34 = 1076 Round to 1,100	45 mg/L x 4.3 mdg x 8.34 = 1614 Round to 1,600

The water quality-based limits for TSS established by the TMDL are more stringent than the technology-based limits above. The permit uses the more stringent limit established by the TMDL as discussed in the next sections.

D. Water Quality-Based Effluent Limitations (WQBELs)

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 by July 1, 1977. 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.

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

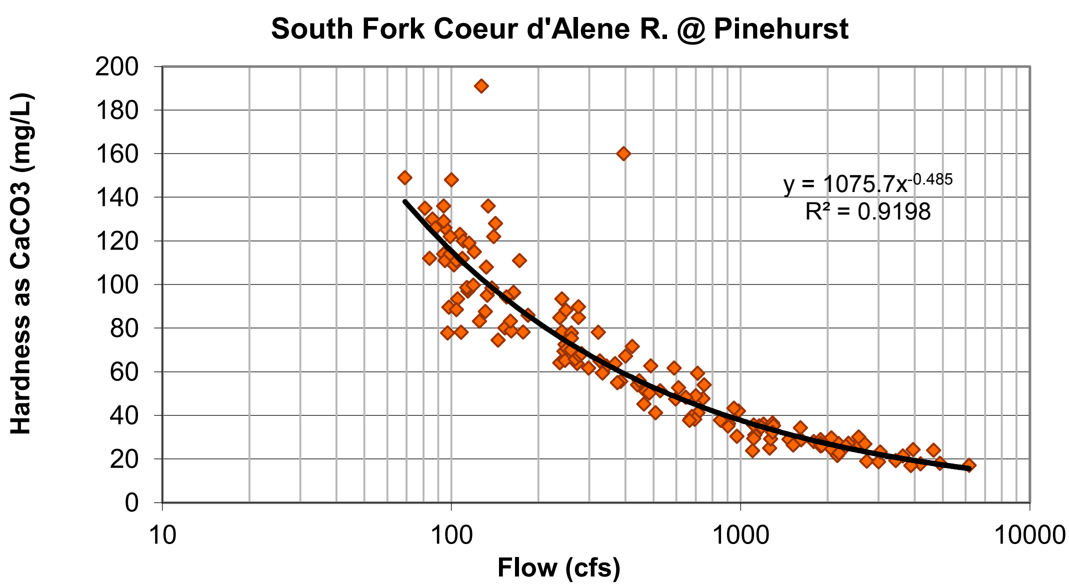
C. Applicable Water Quality Standards (or Criteria)

Hardness-Dependent Metals and Toxics

The toxicities of some metals vary with the hardness of the water. Therefore, the water quality criteria for these metals also vary with hardness. Typically, the EPA uses the hardness of the receiving water when mixed with the effluent to determine the water quality criteria for such metals. Since toxicity decreases (and numeric water quality criteria increase) as hardness increases, EPA has used the 5^{th} percentile as a worst-case assumption for effluent and ambient hardness.

Per Idaho's Water Quality Standards at IDAPA 58.01.02.210.03.c.ii: "The hardness values used for calculating aquatic life criteria for metals at design discharge conditions shall be representative of the ambient hardnesses for a receiving water that occur at the design discharge conditions given in Subsection 210.03.b." The reference to 210.03.b provides the 1Q10/1B3 and 7Q10/4B3 design conditions for aquatic life criteria.

Significant data was analyzed to evaluate appropriate receiving water hardness to use for the South Fork Coeur d'Alene permits. River flow and receiving water hardness are strongly correlated as show below. For river flows less than 100 cfs (7Q10 is 52 cfs), the 5^{th} percentile hardness is 88 mg/L $CaCO_3$ based on hardness data from 1989 through 2011 for the Pinehurst gauge. Similarly, for river flows less than 100 cfs at the Smelterville gauge, the 5^{th} percentile for the hardness data is 93 mg/L $CaCO_3$ based on data from 2002 through 2011. A conservative hardness of 80 mg/L $CaCO_3$ will be used to calculate hardness dependent metals criteria for this permit.



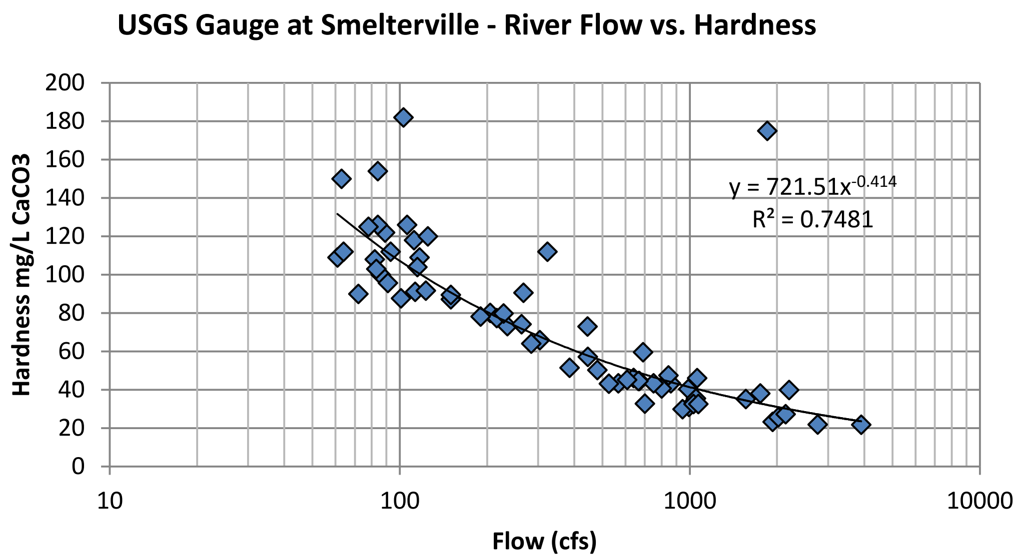


Figure 14. South Fork Coeur d'Alene R. Hardness

Additional data analysis calculated the metals criteria and assimilative capacity for Cadmium, Lead and Zinc as a function of river flow. In all cases, the assimilative capacity is greater at low flows than would be predicted based on flow variation alone because of the relatively higher receiving water hardness at low flows.

The following graphs show the Cadmium, Lead and Zinc criteria as a function of flow, and the assimilative capacity for Cadmium, Lead and Zinc at both the minimum hardness (17 mg/L $CaCO_3$ at Pinehurst) and the actual receiving water hardness at a given river flow. These graphs show that the assimilative capacity at actual river flow and hardness is always greater than the assimilative capacity at actual river flow and assumed low hardness. This indicates that using the minimum or the 5th percentile hardness value to calculate applicable metals criteria would be overly conservative.

Allowing for no dilution and using the river hardness at the critical condition to develop the metals criteria is protective.

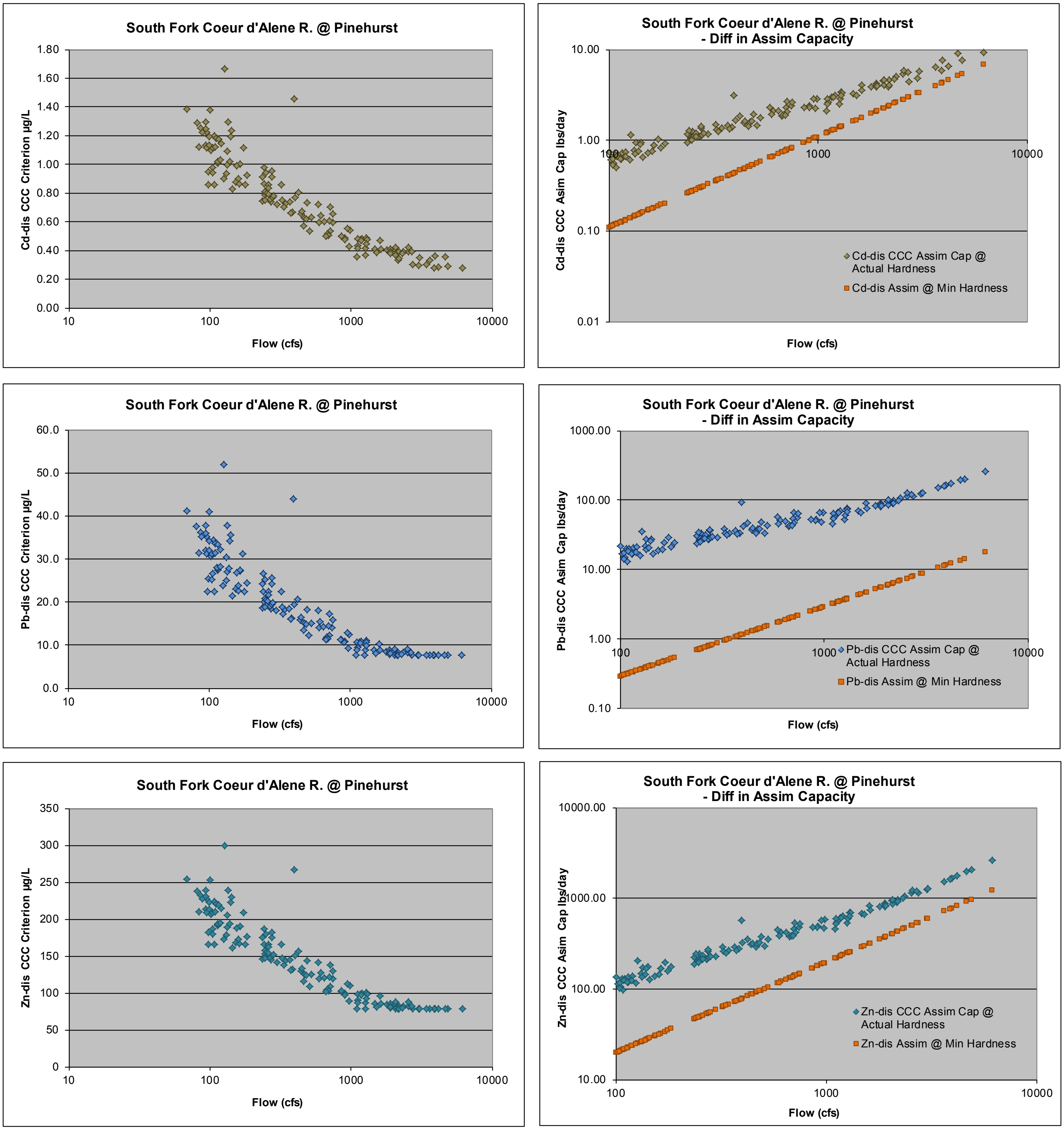


Figure 15. Metals Criteria and Assimilative Capacity vs. River Flow

The hardness-dependent water quality criteria for the metals of concern are expressed as dissolved metal. The dissolved fraction of the metal is the fraction that will pass through a 0.45-micron filter. However, the federal regulation at 40 CFR 122.45(c) requires that NPDES permit effluent limits must be expressed as total recoverable metal. Total recoverable metal is the concentration of the metal in an unfiltered sample. To develop effluent limits for total recoverable metals which are protective of the dissolved metals criteria, "translators" are used in the equations to determine reasonable potential and derive effluent limits. The table below shows the applicable criteria for metals based on the mixed hardness and other toxic chemicals that were detected in the effluent.

The EPA evaluated the potential of the discharge to have reasonable potential to cause or contribute to violations of Idaho's water quality criteria for the pollutants that were found in detectable level in the effluent. See Parts D and E of this Appendix for reasonable potential and effluent limit calculations for these pollutants.

Site Specific Criteria (SSC) for Cadmium, Lead and Zinc

Site-specific water quality criteria (SSC) that reflect local environmental conditions are allowed by federal and state regulations. 40 CFR 131.11 provides States with the opportunity to adopt water quality criteria that are "…modified to reflect site specific conditions."[11] SSC were for Cadmium, Lead and Zinc were adopted by IDEQ in the Water Quality Standards and approved by EPA. The following equations were used to calculate the numeric criteria for these pollutants. The 5th percentile of the effluent hardness at the critical condition was used to calculate the criteria. It was assumed that no mixing zone would be authorized and water quality criteria would be met at the end of pipe. A hardness of 80 mg/L $CaCO_3$ was used to calculate the applicable criteria.

Table 24. Site Specific Criteria Equations for Cadmium, Lead and Zinc

Parameter	CMC (µg/L)	CCC (µg/L)
Cadmium	exp(1.0166 x ln(hardness)-3.924)	[1.101672-(ln(hardness) x 0.041838] x exp(0.7852*LN(hardness)-3.49)
Lead	exp(0.9402 x ln(hardness)+1.1834)	exp(0.9402 x ln(hardness)-0.9875)
Zinc	exp(0.6624 x ln(hardness)+2.2235)	exp(0.6624 x ln(hardness)+2.2235)

[11] Development of Site-Specific Water Quality Criteria for the South Fork Coeur d'Alene River, Idaho, Application Of Site-Specific Water Quality Criteria Developed In Headwater Reaches To Downstream Waters. Idaho Department of Environmental Quality, December 13, 2002, (http://www.deq.idaho.gov/media/445306-sfcda_criteria_downstream.pdf)

Table 25. Applicable Numeric Criteria – Year around

Idaho - Numeric Criteria for Toxic Substances (IDAPA 50.01.02.210)

Sources: IDAPA 58.01.02
EPA National Recommended Water Quality Criteria

		Notes:
Receiving water Hardness, mg/L as	80	Based on coorelation of hardness and flow at Smelterville gauge (2002-2011). Hardness is 80 or greater at critical river flows (<100 cfs)
Receiving pH	7.6	95th Percentile Smelterville Gauge (2002-2011)
Receiving water TSS, mg/L (leave blank if unknown)		
If TSS is annual data, enter 'A'; if from critical period, enter 'S'; If no TSS, leave blank		
Criteria below calculated using:		
Acute Hardness, mg/L:	**80.0**	
Chronic Hardness, mg/L:	**80.0**	
Mixed Hardness:		
Apply 'Mixed Hardness' (Y/N)?:	N	Consistent with IDAPA 58.01.02.210.03.c.ii:, receiving water hardness at the critical condition used.
Effluent Hardness, mg/L:	59	5th percentile DMR Data (2010-2011, representative since drinking water corrosion control lime addition began)
Acute Mixed Hardness, mg/L:	74.8	
Chronic Mixed Hardness, mg/L:	75.7	

Pollutant	Select Pollutant of Concern or enter µg/L	Idaho (Number)	Acute Hardness, mg/L	Chronic Hardness, mg/L	Priority Pollutant?	Carcinogen?	Aquatic Life Criteria, µg/L Acute	Aquatic Life Criteria, µg/L Chronic	Human Health Criteria Water and Organisms, µg/L	Human Health Criteria Organisms only, µg/L	Metals Translators Acute	Metals Translators Chronic
AMMONIA unionized	**yes**	**0.1**			N	N						
CADMIUM	**yes**	**4**	80	80	Y	N	1.7	0.87	Narrative	Narrative	0.973	0.918
CHLORINE (Total Residual)	**yes**	**121**			N	N	19	11				
COPPER	**yes**	**6**	80	80	Y	N	13.8	9.4			0.960	0.960
LEAD	**yes**	**7**	80	80	Y	N	201	22.9	Narrative	Narrative	1.000	1.000
ZINC	**yes**	**13**	80	80	Y	N	168	168	7400.00	26000.00	1.000	1.000

Table 26. Applicable Ammonia Criteria – High Flow – January - June

Freshwater Un-ionized Ammonia Criteria Calculation

Based on IDAPA 58.01.02

	pH	Temperature (deg C)	Data Source
Winter (high flow)	7.5	12	95th Percentile, Smelterville Guage, 2002-2011

INPUT	
1. Receiving Water Temperature (deg C):	12.0
2. Receiving Water pH:	7.50
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
1. Unionized ammonia NH3 criteria (mg NH3/L)	
Acute:	0.110
Chronic:	0.018
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**13.28**
Chronic Criterion (CCC)	**4.36**

Acute Criteria Equation:

$$\frac{0.275}{1+10^{7.204-\mathrm{pH}}}+\frac{39}{1+10^{\mathrm{pH}-7.204}}$$

Chronic Criteria Equation

$$\left(\frac{0.0577}{1+10^{7.688-\mathrm{pH}}}+\frac{2.487}{1+10^{\mathrm{pH}-7.688}}\right)\times \mathrm{MIN}\left(2.85, 1.45\times 10^{0.028\times(25-T)}\right)$$

Table 27. Applicable Ammonia Criteria – Low Flow – June – December

Freshwater Un-ionized Ammonia Criteria Calculation

Based on IDAPA 58.01.02

	pH	Temperature (deg C)	Data Source
Summer (low flow)	**7.6**	**18.9**	95th Percentile, Smelterville Guage, 2002-2011

INPUT	
1. Receiving Water Temperature (deg C):	18.9
2. Receiving Water pH:	7.60
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
1. Unionized ammonia NH3 criteria (mg NH3/L)	
Acute:	0.198
Chronic:	0.028
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**11.37**
Chronic Criterion (CCC)	**3.00**

Acute Criteria Equation:

$$\frac{0.275}{1+10^{7.204-\mathrm{pH}}}+\frac{39}{1+10^{\mathrm{pH}-7.204}}$$

Chronic Criteria Equation

$$\left(\frac{0.0577}{1+10^{7.688-\mathrm{pH}}}+\frac{2.487}{1+10^{\mathrm{pH}-7.688}}\right)\times \mathrm{MIN}\left(2.85, 1.45\times 10^{0.028\times(25-T)}\right)$$

D. Reasonable Potential Analysis

The EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern when evaluating the effluent to determine if water quality-based effluent limits are needed. 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. The discharge has the reasonable potential to cause or contribute to an exceedance of the applicable water quality standard if the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical. A water quality-based effluent limit is required if there is a reasonable potential of the pollutant to exceed the water quality criteria.

Mixing Zones

The methodology for estimating the dilution within the mixing zone at critical conditions is discussed in Appendix C. If the IDEQ does not grant a mixing zone, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

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

The criterion becomes the WLA when a mixing zone is not authorized. A mixing zone may not be authorized by the IDEQ because the receiving water already exceeds the criterion or the receiving water flow is too low to provide dilution, for example. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

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

E. Methodology for Determining Reasonable Potential

The following describes 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. The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control (*refer to as TSD*)* (EPA, 1991) to determine reasonable potential.

The first step is 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. To determine if there is a reasonable potential, 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 section discusses how the maximum projected receiving water concentration is determined.

Mass Balance to Determine Maximum Receiving Water Concentration

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

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

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 or 95th percentile was used where significant effluent data was available. 84 data points were available for metals.
- 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:

$$C_d = \frac{C_e Q_e + C_u Q_u}{Q_e + Q_u} \qquad \text{(Equation D-2)}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

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

Where MZ is the fraction of the receiving water flow available for dilution. In this case, the mixing zone is based on complete mixing of the effluent and the receiving water, and MZ is equal to unity (1). Therefore, in this case, Equation D-3 is equal to Equation D-2.

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

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

Equation D-2 can be simplified by introducing a "dilution factor,"

Dilution Factor $$DF = \frac{Q_d + Q_{\text{critical flow}} \times (\text{percentage of river allowble for mixing})}{Q_d} \qquad \text{(Equation D-5)}$$

Dilution factors were calculated based on low and high seasonal flows using the WWTP design flow. The following table provides the dilution factors used to calculate reasonable potential.

Table 28. Dilution Factors – 50% of River Flow Dilution Allowance

Dilution Factors	Dilution Factor Year Around	Dilution Factor Low Flow (July - November)	Dilution Factor High Flow (December - June)
Dilution Factor - edge of Acute zone	3.9	4.1	4.4
Dilution Factor - edge of Chronic zone	4.7	4.8	5.3
Ammonia	5.2	5.1	6.3
Human Health - Non-Carcinogen	5.4	5.5	7.8
Human Health - Carcinogen	11.7	11.5	11.7

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

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

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as shown in Equation D-7.

$$C_d = \left[\frac{CF \times C_e - C_u}{D}\right] + C_u \qquad \text{(Equation D-7)}$$

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

Equations D-6 and D-7 are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

Maximum Projected Effluent Concentration and Reasonable Potential Determination

The EPA has used the procedure described in section 3.3 of the TSD to calculate the maximum projected effluent concentration. The 99^{th} percentile of the effluent data is the maximum projected effluent concentration in the mass balance equation.

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

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for copper as an example. Reasonable potential calculations for all pollutants are provided in the following table.

All pollutants for which there was a detectable level of the pollutant were evaluated for the reasonable potential to contribute to violations of the aquatic life criteria. It has been determined that ammonia and chlorine have the potential to contribute to violations of the standards during both the high and low river flow periods.

F. WQ-based Effluent Limitations for the Protection of Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The WQBELs 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 are incorporated into the reasonable potential worksheet, Tables 28 and 29.

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 D-6 and D-7). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation D-6 is rearranged to solve for the WLA, becoming:

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

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. The EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation F-2. As discussed in Appendix C, the criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

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

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

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\sigma) \qquad \text{(Equation F-3)}$$
$$LTA_c = WLA_c \times \exp(0.5\sigma_4^2 - z\sigma_4) \qquad \text{(Equation F-4)}$$

where,

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

Derive the maximum daily and average monthly effluent limits

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

$$MDL = LTA \times \exp(z_m\sigma - 0.5\sigma^2) \qquad \text{(Equation F-5)}$$
$$AML = LTA \times \exp(z_a\sigma_n - 0.5\sigma_n^2) \qquad \text{(Equation F-6)}$$

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

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

The following details the calculations for water quality-based effluent limits based on two-value aquatic life criteria.

The following tables show the calculations for the reasonable potential analysis and, where required, the WQ-based effluent limitations.

Ammonia, chlorine, cadmium, lead, and zinc show a reasonable potential to contribute to violations of the WQS. WQ-based effluent limits were established for ammonia on a seasonal basis. Year-around limit were established for chlorine, cadmium, lead and zinc.

Reasonable Potential Analysis - pH

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

Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. The draft permit requires that the effluent have a pH of no less than 6.5 and no greater than 9.0 standard units. The following table shows that under worst case receiving water conditions at both the high and low river flow conditions the WQ-based effluent limits have no reasonable potential in contributing to non-attainment of the surface water criteria for pH.

Table 29. Reasonable Potential Analysis for pH

Calculation of pH of a Mixture of Two Flows

Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	Yr. Aournd Basis		
INPUT	**Min Limit**	**Max Limit**	**Comments**
1. Dilution Factor at Mixing Zone Boundary	4.8	4.8	Chronic Dilution Factor at Design Flow and Low River Flow Conditions
2. Ambient/Upstream/Background Conditions			
Temperature (deg C):	19.80	2.00	Max. and min. temperature for lower and upper pH, respectively, based on USGS Smelterville
pH	6.70	7.60	5th Percentile and 95th Percentile pH for lower and upper pH, respectively, based on USGS data Smelterville.
Akalinity (mg $CaCO_3$/L):	50.00	50.00	No data available. Assume conservative value.
3. Effluent Characteristics			
Temperature (deg C):	24.30	3.50	Max and min for lower and upper temperature, DMR data
pH	**6.50**	**9.00**	Limts estiablished based on WQS. Actual max effluent 7.7, min effluent 7.1 based on permit application.
Akalinity (mg CaCO3/L):	100.00	100.00	No data available. Assume conservative value.
OUTPUT			
1. Ionization Constants			
Upstream/Background pKa:	6.38	6.55	
Effluent pKa:	6.35	6.53	
2. Ionization Fractions			
Upstream/Background Ionization Fraction:	0.67	0.92	
Effluent Ionization Fraction:	0.58	1.00	
3. Total Inorganic Carbon			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	74	54	
Effluent Total Inorganic Carbon (mg CaCO3/L):	171	100	
4. Condtions at Mixing Zone Boundary			
Temperature (deg C):	20.73	2.31	
Akalinity (mg CaCO3/L):	60.34	60.34	
Total Inorganic Carbon (mg CaCO3/L):	94.25	63.92	
pKa:	6.38	6.54	
RESULTS			
pH at Mixing Zone Boundary:	**6.63**	**7.77**	Effluent limits based on WQS do not have a reasonable potential to contibute to violations of the pH standards.

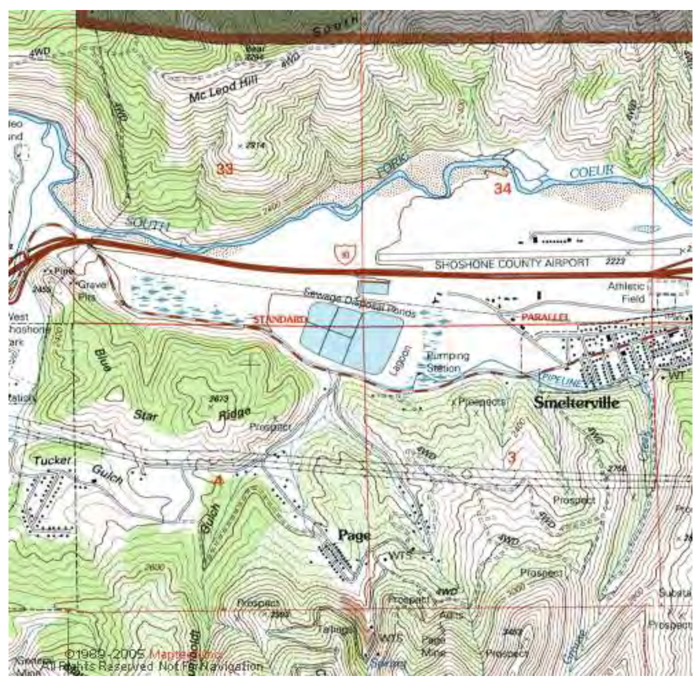
Reasonable Potential Analysis – Dissolved Oxygen

The reasonable potential to cause or contribute to violations of the dissolved oxygen criteria of 6 mg/L can be evaluated using the Streeter-Phelps model. The Streeter-Phelps equation (also known as the "dissolved oxygen sag" equation) is based on a mass balance which is affected by two processes. One is that oxygen is removed from water by the degradation of organic materials. In other words, the biochemical oxygen demand of an organic waste is satisfied by oxygen taken from the water. The second process is "reaeration" by oxygen transfer into the water from the atmosphere.

The model shows that the downstream DO will read a low of 6 mg/L and therefore is unlikely to contribute to a violation of standard. Estimated worst case was used for input data into the model based on best available information.

Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag

INPUT				
1. EFFLUENT CHARACTERISTICS				
Discharge (cfs):			7.03885	combined flow
CBOD5 (mg/L):			25	Technology based limit for CBOD
NBOD (mg/L):			0	No data
Dissolved Oxygen (mg/L):			2	Estimate
Temperature (deg C):			24	95th Percentile DMR data
2. RECEIVING WATER CHARACTERISTICS				
Upstream Discharge (cfs):			52.6	Low Flow 7Q10
Upstream CBOD5 (mg/L):			1.5	
Upstream NBOD (mg/L):			0.2	
Upstream Dissolved Oxygen (mg/L):			8.32	5th Percentile at Smelterville
Upstream Temperature (deg C):			20.7	95th Percentile at Smelterville
Elevation (ft NGVD):			2200	Topo Map
Downstream Average Channel Slope (ft/ft):			0.00088	
Downstream Average Channel Depth (ft):			4	
Downstream Average Channel Velocity (fps):			1	
3. REAERATION RATE (Base e) at 20 deg C (day^-1):			3.57	
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values	
Churchill	1.5 - 6	2 - 50	1.14	
O'Connor and Dobbins	0.1 - 1.5	2 - 50	1.62	
Owens	0.1 - 6	1 - 2	1.66	
Tsivoglou-Wallace	0.1 - 6	0.1 - 2	3.65	
4. BOD DECAY RATE (Base e) AT 20 deg C (day^-1):			2.51	
(Suggested value = 2.51, *Wright and McDonnell, 1979*)				
OUTPUT				
1. INITIAL MIXED RIVER CONDITION				
CBOD5 (mg/L):			4.3	
NBOD (mg/L):			0.2	
Dissolved Oxygen (mg/L):			7.6	
Temperature (deg C):			21.1	
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)				
Reaeration (day^-1):			3.66	
BOD Decay (day^-1):			2.64	
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU				
Initial Mixed CBODU (mg/L):			6.3	
Initial Mixed Total BODU (CBODU + NBOD, mg/L):			6.5	
4. INITIAL DISSOLVED OXYGEN DEFICIT				
Saturation Dissolved Oxygen (mg/L):			8.204	
Initial Deficit (mg/L):			0.63	
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):			0.28	
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):			4.62	
7. CRITICAL DO DEFICIT (mg/L):			2.21	
8. CRITICAL DO CONCENTRATION (mg/L):			**6.00**	



Reasonable Potential Analysis – Temperature

The **current EPA- approved aquatic life criteria** for temperature are as follows:

Cold Water Aquatic Life:	Daily Average = 19°C; Max Daily = 22°C This criterion applies from July 16 – September 30. (see IDAPA 58.01.02.250.02.b)
Wastewater Provision:	The wastewater must not affect the receiving water outside the mixing zone so that :…If the water is designated for cold water aquatic life, seasonal cold water aquatic life, or salmonid spawning, the induced variation is more than one (+1) degree C (see IDAPA 58.01.02.401.01.d).

Continuous temperature monitoring of the effluent and the receiving water is necessary to determine daily average and daily maximum temperatures. The daily average and maximum temperatures of both the effluent and receiving water are necessary to accurately determine the reasonable potential to contribute to violations of the various temperature criteria.

The permit required the permittee to collected grab samples for temperature twice per month. Temperature data was reported on the DMR as a monthly average and monthly maximum, refer to DMR data summary, Appendix B. There is insufficient daily data to fully evaluate compliance with temperature standard.

The permit will incorporate daily monitoring of effluent temperature, and the river temperature upstream and downstream from the point of discharge to better evaluate the need for temperature limits in the future.

Reasonable Potential Analysis – Whole Effluent Toxicity

Whole Effluent Toxicity (WET) refers to the aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's effluent. At this time, the EPA is including a trigger in the draft permit, the rationale is explained below.

The Idaho water quality standards have a narrative criterion at IDAPA 58.01.02.200.02 that requires surface waters of the state to be free from toxic substances in concentrations that impair designated beneficial uses. This narrative criterion is the basis for establishing WET controls in NPDES permits (see 40 CFR 122.44(d)(1)). For protection against chronic effects to aquatic life the EPA recommends using 1.0 chronic toxic units (TUc) to the most sensitive of at least three test species (*EPA Region 10 Toxicity Training Tool*, Debra Denton, Jeff Miller, Robyn Stuber, September2007).

Chronic toxicity tests were conducted on the effluent from the facility according to procedures in the EPA's *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA-821-R-02-013). The procedures involved a 7-day static-renewal exposure to the effluent. The endpoints from these tests were *Ceriodaphnia dubia* survival and reproduction, and fathead minnow survival and growth. Toxicity tests from 2007 onward were provided with the application for permit renewal and were reviewed by the EPA.

The permit allows for 25% of river flow for dilution for evaluation of WET.

Low Flow (July-December)

$$C_e = \frac{(C_d \times Q_d) - (C_u \times Q_u)}{Q_e} = \frac{(1 \times ((54 \times 0.25) + 6.7)) - (0 \times 54 \times 0.25)}{6.7} = 2.9\ TU_c$$

High Flow (January - June)

$$C_e = \frac{(C_d \times Q_d) - (C_u \times Q_u)}{Q_e} = \frac{(1 \times ((60.8 \times 0.25) + 6.7)) - (0 \times 60.5 \times 0.25)}{6.7} = 3.2\ TU_c$$

Where
C_d = criterion not to be exceeded in the water body = 1 TUc
Q_d = receiving water flow downstream of the effluent discharge = Qu + Qe
C_e = allowable effluent concentration
Q_e = maximum effluent flow = 4.3 mgd = 6.7 cfs
C_u = upstream concentration of pollutant = 0 (no data available)
Q_u = upstream flow = 54 cfs (July-December); 60.8 cfs (January - June)
MZ = 25% =0.25

Additionally, the toxicity testing on each organism must include a series of five test dilutions and a control. The dilution series must include the receiving water concentration (RWC), which is the dilution associated with the chronic toxicity trigger (i.e. 26% from June through November and 24% from December through May); two dilutions above the RWC, and two dilutions below the RWC. The receiving water concentration is calculated as follows:

RWC = $Q_e \div [(\text{Mixing Zone} \times Q_u) + Q_e]$

RWC (low flow) =- 6.7/[0.25x54+6.7] x 100% = 34%

RWC (high flow) =- 6.7/[0.25x60.8+6.7] x 100% = 32%

Reasonable Potential Analysis - E. Coli

The proposed permit does not allow for a mixing zone for bacteria. The permittee must meet the water quality standards at the point of discharge. Therefore, there is not reasonable potential when the permittee is in compliance with the effluent limitations.

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.).

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.

Reasonable Potential Analysis – Turbidity

There was insufficient information to adequately evaluate the impacts of the discharge on turbidity. Typical a simple mixing model can be used to evaluate the final turbidity downstream from the point of discharge. There was limited data about turbidity upstream and downstream from the USGS gauge stations at Smelterville and Pinehurst, respectively. Additionally, the permittee is required to monitoring total suspended solids (TSS) and not turbidity.

It is assumed that the technology-based limit for TSS is protective of water quality for turbidity. The waterbody is impaired for TSS for which a TMDL has completed and a wasteload has been allocated to the Page WWTP.

Reasonable Potential Analysis – Numeric Criteria

The following Excel® worksheets incorporate both Reasonable Potential Analysis and, as needed, water-quality based effluent limitations (WQBELs). TSD calls for using n≥4 if the limit is based on the chronic long term average (LTAc) because the chronic criterion is based on 4-days. (Reference EPA Technical Support Document, March 1991, Section 5.5.3, page 107)

Table 30. Reasonable Potential and Limits for Aquatic Life Criteria – Low Flow

Reasonable Potential Calculation

Facility:	SFCDSD - Page WWTP
Water Body Type	Freshwater

Water Designation	Dilution Factors	
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	4.1	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	4.8	7Q10 or 4B3
Ammonia	5.1	30B3
Human Health - Non-Carcinogen	5.5	30Q5
Humn Health - carcinogen	11.5	Harmonic Mean Flow

Receiving Water Hardness = 80 mg/L

Receiving Water Temp, °C	18.9	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)
Receiving Water pH	7.6	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)

Pollutant			AMMONIA, as Total NH3	CHLORINE (Total Residual)	CADMIUM	COPPER	LEAD	ZINC
Effluent Data	# of Samples (n)		336	1680	84	84	84	84
	Coeff of Variation (Cv)		0.6	0.6	0.79	0.39	0.7	0.74
	Effluent Concentration, μg/L (Max. or 95th Percentile)		17,000	228	2.6	13.7	26.7	531
	Calculated 50th percentile Effluent Conc. (when n>10)				1.0		13.3	216
Mizing Zone Used	Aquatic Life - Acute		4.1	4.1	1.0	4.1	1.0	1.0
	Aquatice Life - Chronic			4.8	1.0	4.8	1.0	1.0
	Ammonia		5.1				1.0	1.0
	Human Health - Non-Carcinogen			5.5	1.0	5.5	1.0	1.0
	Humn Health - carcinogen			11.5	1.0	11.5	1.0	1.0
Receiving Water Data	90th Percentile Conc., μg/L		78.0	1.6		2.07		
	Geo Mean, μg/L							
Water Quality Criteria	Aquatic Life Criteria, μg/L	Acute	11,375	19	1.7	13.8	201	168
		Chronic	2,997	11	0.87	9.4	22.9	168
	Human Health Water and Organism, μg/L		-	-	Narrative	-	Narrative	7400
	Human Health, Organism Only, μg/L		-	-	Narrative	-	Narrative	26000
	Metal Criteria Translator, decimal	Acute	-	-	0.973	0.960	1.000	1.000
		Chronic	-	-	0.918	0.960	1.000	1.000
	Carcinogen?		N	N	N	N	N	N

Aquatic Life Reasonable Potential

			AMMONIA	CHLORINE	CADMIUM	COPPER	LEAD	ZINC
σ	$\sigma 2 = \ln(CV^2+1)$		0.555	0.555	0.696	0.376	0.631	0.661
Pn	$=(1\text{-confidence level})^{1/n}$	99%	0.986	0.997	0.947	0.947	0.947	0.947
Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	1.1	0.8	1.6	1.3	1.6	1.6
Max. conc.(ug/L) at		Acute	4,511	44.8	4.2	5.8	41.9	850
		Chronic	3,588	38.0	3.9	5.2	41.9	850
Reasonable Potential? Limit Required?			YES	YES	YES	NO	YES	YES

Aquatic Life Limit Calculation

			AMMONIA	CHLORINE	CADMIUM	COPPER	LEAD	ZINC
n = # samples assumed to calculate AML			30	20	4		4	1
# of Compliance Samples Expected per month			**8**	**20**	**1**		**1**	**1**
LTA Coeff. Var. (CV),	default = 0.6 or calculate from data		0.6	0.6	0.79		0.7	0.74
Permit Limit Coeff. Var. (CV), decimal			0.6	0.6	0.79		0.7	0.74
Waste Load Allocations,	$C_d=(C_r x MZ_a)-C_{sa}x(MZ_a-1)$	Acute	46,120.6	72.52	1.65		201.02	168.37
	$C_d=(C_r x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic	15,108.1	47.06	0.87		22.93	168.37
Long Term Averages, ug	WLAa x $\exp(0.5\sigma^2-2.326\sigma)$	Acute	14,808.6	23.28	0.42		56.48	**45.03**
	WLAc x $\exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic	**11,788.8**	**24.82**	**0.39**		**11.02**	78.03
Limiting LTA, ug/L	used as basis for limits calculation		11,788.8	23.28	0.39		11.02	45.03
Metal Translator or 1?			1.00	1.00	0.918		1.000	1.000
Average Monthly Limit (AML), ug/L		**95%**	**14025**	**29**	**0.73**		**18**	**107**
Maximum Daily Limit (MDL), ug/L		**99%**	36723	**73**	**1.7**		**39**	**168**
Average Monthly Limit (AML), mg/L			**14.02**	0.029	0.001		0.018	0.107
Maximum Daily Limit (MDL), mgL			**36.72**	0.073	0.002		0.039	0.168
Average Monthly Limit (AML), lb/day, Page Flow		**4.30**	**503**	**1.0**	**0.026**	1.44	**0.65**	**3.8**
Maximum Daily Limit (MDL), lb/day, Page Flow		**4.30**	**1317**	**2.6**	**0.060**	1.86	**1.4**	**6.0**

Human Health Reasonable Potential

	AMMONIA	CHLORINE	CADMIUM	COPPER	LEAD	ZINC
s						0.661
Pn			0.965		0.965	0.965
Multiplier						0.30
Dilution Factor			5.5		5.5	5.5
Max Conc. at edge of Chronic Zone, ug/L						39.349
Reasonable Potential to exceed HH Water & Organism			NO		NO	**NO**
Reasonable Potential to exceed HH Organism only			NO		NO	**NO**

Comments/Notes:

References: IDAPA 58.01.02

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Note: Ammonia limits expressed in the above table are based on Page utilizing the full waste load allocation. Refer to Section G. Alternate Water Quality-Based Effluent Limits for Page and Smelterville for the assigned effluent limits.

Table 31. Reasonable Potential and Limits for Aquatic Life Criteria – High Flow

Reasonable Potential Calculation

Facility:	SFCDSD - Page WWTP
Water Body Type	Freshwater

Water Designation	Dilution Factors	
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**4.4**	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**5.3**	7Q10 or 4B3
Ammonia	**6.3**	30B3
Human Health - Non-Carcinogen	**7.8**	30Q5
Humn Health - carcinogen	**11.7**	Harmonic Mean Flow

Receiving Water Hardness = 80 mg/L

Receiving Water Temp, °C	12	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)
Receiving Water pH	7.5	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)

Pollutant		AMMONIA, as Total NH3	CHLORINE (Total Residual)	CADMIUM	COPPER	LEAD	ZINC
Effluent Data	# of Samples (n)	336	1680	84	84	84	84
	Coeff of Variation (Cv)	0.6	0.6	0.79	0.39	0.7	0.74
	Effluent Concentration, µg/L (Max. or 95th Percentile)	17,000	228	2.6	13.7	26.7	531
	Calculated 50th percentile Effluent Conc. (when n>10)			1.0		13.3	216
Mizing Zone Used	Aquatic Life - Acute	4.4	4.4	1.0	4.4	1.0	1.0
	Aquatice Life - Chronic		5.3	1.0	5.3	1.0	1.0
	Ammonia	6.3				1.0	1.0
	Human Health - Non-Carcinogen		7.8	1.0	7.8	1.0	1.0
	Humn Health - carcinogen		11.7	1.0	11.7	1.0	1.0
Receiving Water Data	90th Percentile Conc., µg/L	78.0	1.6		2.07		
	Geo Mean, µg/L						
Water Quality Criteria	Aquatic Life Criteria, µg/L Acute	13,283	19	1.7	13.8	201	168
	Chronic	4,364	11	0.87	9.4	22.9	168
	Human Health Water and Organism, µg/L	-	-	Narrative	-	Narrative	7400
	Human Health, Organism Only, µg/L	-	-	Narrative	-	Narrative	26000
	Metal Criteria Translator, decimal Acute	-	-	0.973	0.960	1.000	1.000
	Chronic	-	-	0.918	0.960	1.000	1.000
	Carcinogen?	N	N	N	N	N	N

Aquatic Life Reasonable Potential

			Ammonia	Chlorine	Cadmium	Copper	Lead	Zinc
σ	$\sigma 2=\ln(CV^2+1)$		0.555	0.555	0.696	0.376	0.631	0.661
Pn	$=(1\text{-confidence level})^{1/n}$	99%	0.986	0.997	0.947	0.947	0.947	0.947
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	1.1	0.8	1.6	1.3	1.6	1.6
Max. conc.(ug/L) at		Acute	4,162	41.4	4.2	5.5	41.9	850
		Chronic	2,946	34.7	3.9	4.9	41.9	850
Reasonable Potential? Limit Required?			**NO**	**YES**	**YES**	**NO**	**YES**	**YES**

Aquatic Life Limit Calculation

			Ammonia	Chlorine	Cadmium	Copper	Lead	Zinc
n = # samples assumed to calculate AML				20	4		4	1
# of Compliance Samples Expected per month				**20**	**1**		**1**	**1**
LTA Coeff. Var. (CV),	default = 0.6 or calculate from data			0.6	0.79		0.7	0.74
Permit Limit Coeff. Var. (CV), decimal				0.6	0.79		0.7	0.74
Waste Load Allocations,	$C_d=(C_r x MZ_a)-C_{sa} x(MZ_a-1)$	Acute		78.58	1.65		201.02	168.37
	$C_d=(C_r x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic		51.60	0.87		22.93	168.37
Long Term Averages, ug	$WLAa \times \exp(0.5\sigma^2-2.326\sigma)$	Acute		**25.23**	0.42		56.48	**45.03**
	$WLAc \times \exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic		27.21	**0.39**		**11.02**	78.03
Limiting LTA, ug/L	used as basis for limits calculation			25.23	0.39		11.02	45.03
Metal Translator or 1?				1.00	0.918		1.000	1.000
Average Monthly Limit (AML), ug/L		**95%**		**31**	**0.73**		**18**	**107**
Maximum Daily Limit (MDL), ug/L		**99%**		**79**	**1.7**		**39**	**168**
Average Monthly Limit (AML), mg/L				0.031	0.001		0.018	0.107
Maximum Daily Limit (MDL), mgL				0.079	0.002		0.039	0.168
Average Monthly Limit (AML), lb/day, Page Flow		**4.30**	801	**1.1**	**0.026**	1.56	**0.65**	**3.8**
Maximum Daily Limit (MDL), lb/day, Page Flow		**4.30**	2098	**2.8**	**0.060**	2.01	**1.4**	**6.0**

Human Health Reasonable Potential

	Ammonia	Chlorine	Cadmium	Copper	Lead	Zinc
s						0.661
Pn			0.965		0.965	0.965
Multiplier						0.30
Dilution Factor			7.8		7.8	7.8
Max Conc. at edge of Chronic Zone, ug/L						27.826
Reasonable Potential to exceed HH Water & Organism			NO		NO	**NO**
Reasonable Potential to exceed HH Organism only			NO		NO	**NO**

Human Health Limit Calculation

# of Compliance Samples Expected per month	
Average Monthly Effluent Limit, ug/L	
Maximum Daily Effluent Limit, ug/L	

Comments/Notes:

References: IDAPA 58.01.02

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Table 32. Reasonable Potential Aquatic Life Criteria – Copper at Low Flow 25% River for Dilution

Reasonable Potential Calculation

Facility:	SFCDSD - Page WWTP
Water Body Type	Freshwater

Water Designation	Dilution Factors	
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	2.6	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	3.0	7Q10 or 4B3
Ammonia	3.2	30B3
Human Health - Non-Carcinogen	3.4	30Q5
Humn Health - carcinogen	6.6	Harmonic Mean Flow

Receiving Water Hardness = 80 mg/L

Receiving Water Temp, °C	18.9	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)
Receiving Water pH	7.6	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)

Pollutant			COPPER
Effluent Data	# of Samples (n)		84
	Coeff of Variation (Cv)		0.39
	Effluent Concentration, µg/L (Max. or 95th Percentile)		13.7
	Calculated 50th percentile Effluent Conc. (when n>10)		
Mizing Zone Used	Aquatic Life - Acute		2.6
	Aquatice Life - Chronic		3.0
	Ammonia		
	Human Health - Non-Carcinogen		3.4
	Humn Health - carcinogen		6.6
Receiving Water Data	90th Percentile Conc., µg/L		2.07
	Geo Mean, µg/L		
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	13.8
		Chronic	9.4
	Human Health Water and Organism, µg/L		-
	Human Health, Organism Only, µg/L		-
	Metal Criteria Translator, decimal	Acute	0.960
		Chronic	0.960
	Carcinogen?		N

Aquatic Life Reasonable Potential

σ	$\sigma 2=\ln(CV^2+1)$		0.376
Pn	$=(1\text{-confidence level})^{1/n}$	99%	0.947
Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	1.3
Max. conc.(ug/L) at		Acute	7.8
		Chronic	7.1
Reasonable Potential? Limit Required?			**NO**

G. Alternate Water Quality-Based Effluent Limits for Page and Smelterville

The propose permit recognizes the shared mixing zone for the Page and Smelterville WWTPs. As such, the allowable dilution for each facility is much less than in the current permits. The following equation describes the mass balance for total load at the sum of load from each facility.

$$Q_p \times C_p + Q_s \times C_s = Q_t \times C_t$$

where
Q_p = Design flow of Page WWTP (mdg)
Q_s = Design flow of Smelterville WWTP (mdg)
C_p = Concentration limit for Page WWTP (mg/L)
C_s = Concentration limit for Smelterville WWTP (mg/L)
Q_t = Design flow combined WWTPs (mdg)
C_t = water quality based effluent limit for both (mg/L)

The following table describes the possible load allocations for each facility that would meet the total load allocation based on the limits calculations. The table includes the current permit limits for each of the facilities.

The proposed permit recommends a load allocation that would allow each facility to best meet the proposed permit limits. A load allocation which gives additional load to Smelterville than would be allotted based on flow alone would allow both facilities to meeting the limits in the proposed permit. Page represents 95% of the total flow based on design flow.

Table 33. Possible Ammonia Load Allocations for Shared Mixing Zone

	Percent of total flow - Page	Percent of total flow - Smelterville	AML Load - Page	AML Conc - Page	AML Load - Smelterville	AML Conc - Smelterville	MDL Load - Page	MDL Conc - Page	MDL Load - Smelterville	MDL Conc - Smelterville	AML Total Load	MDL Total Load
Based on Design Flows	95%	5%	502.8	**14.0**	29.2	**14.0**	1316.9	36.7	76.6	36.7	532	1393
	94%	6%	497.5	**13.9**	34.6	**16.6**	1302.9	36.3	90.5	43.4	532	1393
	93%	7%	492.1	**13.7**	39.9	**19.1**	1289.0	35.9	104.4	50.1	532	1393
	92%	8%	486.8	**13.6**	45.2	**21.7**	1275.1	35.6	118.4	56.8	532	1393
	91%	9%	481.5	**13.4**	50.5	**24.2**	1261.1	35.2	132.3	63.5	532	1393
Proposed	90%	10%	476.2	**13.3**	55.8	**26.8**	1247.2	34.8	146.2	70.1	532	1393
	89%	11%	470.9	**13.1**	61.2	**29.3**	1233.2	34.4	160.2	76.8	532	1393
	88%	12%	465.5	**13.0**	66.5	**31.9**	1219.3	34.0	174.1	83.5	532	1393
	87%	13%	460.2	**12.8**	71.8	**34.4**	1205.4	33.6	188.0	90.2	532	1393
	86%	14%	454.9	**12.7**	77.1	**37.0**	1191.4	33.2	202.0	96.9	532	1393
	85%	15%	449.6	**12.5**	82.4	**39.5**	1177.5	32.8	215.9	103.6	532	1393
Page current limit/Load	84%	16%	444.3	**12.4**	87.8	**42.1**	1163.6	32.4	229.8	110.2	532	1393
Load/Limit in Current Permit			445	**12**	284	***136***	760	21	1095	*525*	729	1855
Reduction in Total Load in Proposed Permit											197	462
Performance during current Permit												
Ammonia Conctrations mg/L	Permit Max in past 2 years			16.7		28.1		18.1		29.6		
Ammonia Conctrations mg/L	95th Percentile duration of permit			17		24.1		18.3		26.1		

Note higher numbers more recently for Smelterville
Note lower numbers more recently for Page

H. Calculate TMDL-based Effluent Limits for TSS

The TMDL established a load allocation for TSS of 115 tons per year. The weekly average limit is calculated by multiplying the monthly average limit by the multiplier 2.01.

From TSD Table 5-3, n= 4, CV = 0.6 (default value). The individual data sample data were not provide, only the monthly average and maximum weekly average. Therefore, the default value should be assumed.

$$\text{Monthly Avearge Mass Limit} = \frac{115 \text{ tons}}{\text{year}} \times \frac{2000 \text{ lbs}}{\text{ton}} \times \frac{\text{year}}{365 \text{ days}} = 630\ \frac{\text{lbs}}{\text{day}}$$

$$\text{Weekly Averge Mass Limit} = 630\ \frac{\text{lbs}}{\text{day}} \times 2.01 = 1{,}260\ \frac{\text{lbs}}{\text{day}}$$

The current permit used a CV=0.5 and the resulting multiplier of 1.84.

$$\text{Weekly Averge Mass Limit} = 630\ \frac{\text{lbs}}{\text{day}} \times 1.84 = 1{,}160\ \frac{\text{lbs}}{\text{day}}$$

The proposed permit will retain the previous permit limit to avoid backsliding.

The TMDL does not address concentration limits for TSS. Since there are technology-based concentration limits for secondary treatment those limits must apply.

$$\text{Monthly Avearge Mass Limit} = 30\frac{\text{mg}}{\text{L}}$$

$$\text{Weekly Averge Mass Limit} = 45\frac{\text{mg}}{\text{L}}$$

The following graphs show the historical performance for TSS. Based on historical performance, the WWTP should be able to meet the TSS effluent limitations in the proposed permit.

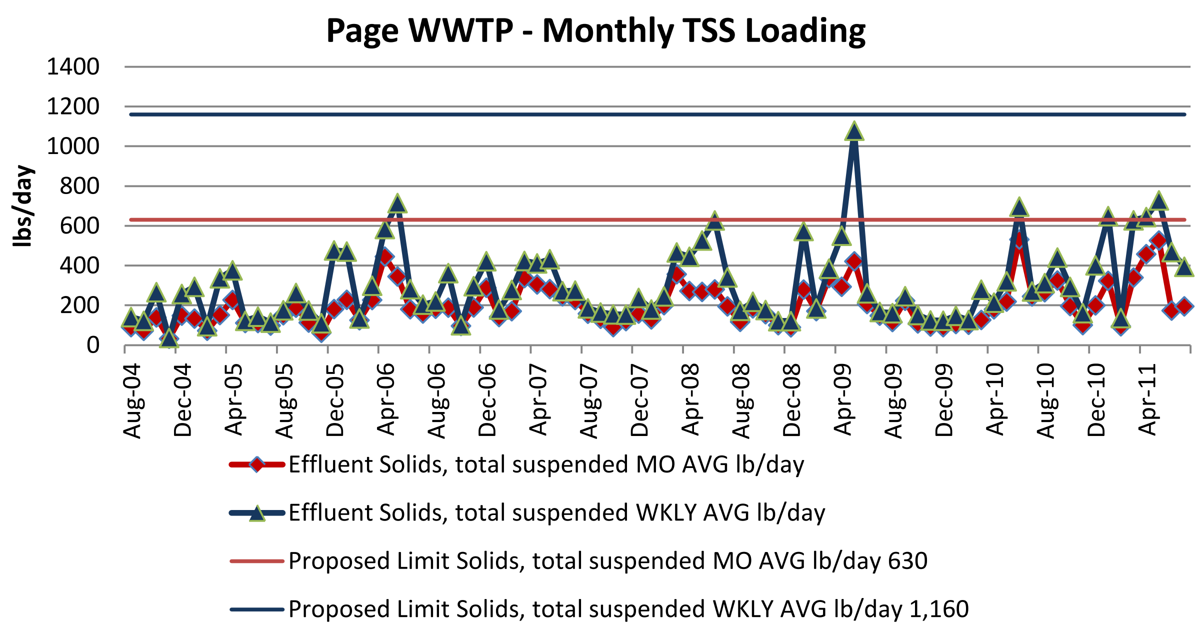


Figure 16. Historic TSS Loading

I. Interim Effluent Limitations for Cadmium, Lead and Zinc

Upon expiration of the approved variance for Cadmium, Lead and Zinc, the EPA has established a performance-based effluent limitation based on the existing treatment ability to treat these pollutants and based on the level of these pollutants in the discharge over duration of the current permit.

For consistency, the performance-based limits were calculated using the same methodology as previous variance-based limits incorporating addition new data collected (Nov. 2008-July 2011) since the variance limits were developed.

Figure 17. Performance-based Effluent Limits for Cadmium, Lead and Zinc

Performanced Based Limits					units	**Cadmium**		**Lead**		**Zinc**	
Using data 2004-2011				Average	ug/L	1.05		13.26		216.25	
				Minimum	ug/L	0.1		0.1		3.7	
				Maximum	ug/L	**4.48**		**53.1**		**889**	
				Count	ug/L	84		84		84	
				Std Dev	ug/L	0.8		8.8		151.5	
				CV	ug/L	**0.750**		**0.665**		**0.701**	
				95th Percentile	ug/L	2.6		26.7		531.1	
				5th Percentile	ug/L	0.2		4.0		71.5	
			samples per month n			1.0		1.0		1.0	
Method for Variance			σ	σ2=ln(CV²+1)		0.668		0.605		0.632	
			Pn	=(1-confidence level)$^{1/n}$	99%	0.947		0.947		0.947	
99% - 99%			RP Multiplier	=exp(2.3262σ-0.5σ²)/exp(invnorm(P$_N$)σ-0.5σ²)	99%	1.61		1.54		1.57	
						ug/L	lb/day	ug/L	lb/day	ug/L	lb/day
maximum expected concentration, TSD page 57				MDL=MAX x RPA Multiplier		**7.2**	**0.26**	**81.8**	**2.9**	**1395**	**50**
Table 5-3 value		MDL multiplier	99%	AML Multiplier	95%	1.58		1.51		1.54	
				AML = MDL/Multiplier		**4.6**	**0.16**	**54.1**	**1.9**	**907**	**33**

The current variance-based limits were based on data from August 2004 through October 2008. The more stringent 2009 variance-based limit for zinc will be retained as the interim performance-based limits.

Parameter		**2009 Variance**		**Performance-based**	
	Units	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Cadmium	µg/L	5.3	8.3	**4.6**	**7.2**
	lb/day	0.19	0.30	**0.16**	**0.26**
Lead	µg/L	63	96	**54**	**82**
	lb/day	2.2	3.4	**1.9**	**2.9**
Zinc	µg/L	**800**	**1,340**	910	1,400
	lb/day	**29**	**48**	33	50

Appendix E: Variance

A variance is a temporary relaxation of water quality standards. Variances are granted by IDEQ to facilities for specified pollutants in their wastewater based upon a rationale as to why more time is needed to meet the prevailing criteria. The allowed reasons for a variance are the same as for beneficial use changes under a use attainablity analysis.

Variance documents are available on the IDEQ website at http://www.deq.idaho.gov/water-quality/surface-water/standards/variances.aspx.

Appendix F: Biological Evaluation

Section 7 of the Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species and/or their critical habitat. EPA has reviewed the ESA-listed species and critical habitat data on each of the agency's websites. There are no ESA-listed species and critical habitat in the vicinity of the discharge. EPA determined that the reissuance of the NPDES permit to the South Fork Coeur d'Alene River Sewer District for discharges of treated municipal wastewater to the South Fork Coeur d'Alene River will have "no effect" on any of the threatened or endangered species or their critical habitat in the vicinity of the discharges. Additionally, EPA determines that the reissuance of the NPDES permit will not adversely affect Essential Fish Habitat (EFH).

The information below summarizes the threatened and endangered species in the State of Idaho and in the vicinity of the discharges.

Threatened and Endangered Species in Idaho are available on the USFWS website at http://www.fws.gov/endangered/

For Shoshone County, Idaho

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Action Status	Recovery Plan Stage
Fishes	Bull Trout (*Salvelinus confluentus*)	U.S.A., conterminous, lower 48 states	Threatened	Idaho Fish And Wildlife Office Office Name: Idaho Fish And Wildlife Office Address: 1387 SOUTH VINNELL WAY, SUITE 368 BOISE, ID83709 Phone Number: (208)378-5243	Draft Recovery Plan for the Jarbidge River Distinct Population Segment of Bull Trout	View Implementation Progress	Draft
Mammals	Canada Lynx (*Lynx canadensis*)	(Contiguous U.S. DPS)	Threatened	Montana Ecological Services Field Office Office Name: Montana Ecological Services Field Office Address: 585 Shepard Way HELENA, MT59601 Phone Number: (406)449-5225	Recovery Outline for the Contiguous United States Distinct Population Segment of Canada Lynx (Lynx canadensis)	Recovery efforts in progress, but no implementation information yet to display.	Outline

U.S Fish & Wildlife Service shows no designated critical habitat information in either Shoshone County. http://criticalhabitat.fws.gov/crithab/. Critical habitat shown in yellow.

Figure 18. Critical Habitat

NOAA"s Essential Fish Habitat Mapper (http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx) shows not essential fish habitat in the vicinity of the proposed action. EFH shown in yellow.

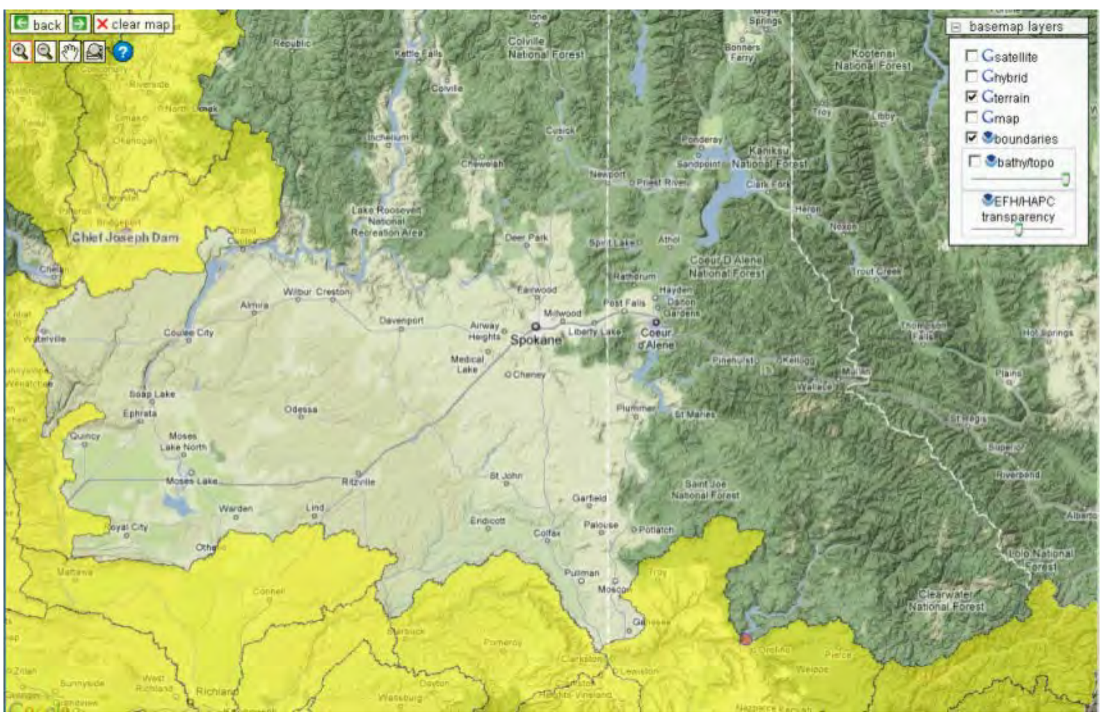


Figure 19. Essential Fish Habitat

Appendix G: Tribal Review or Consultation

The Coeur d'Alene Tribe reservation is located around the south end of Lake Coeur d'Alene. The South Fork Coeur d'Alene river joins the North Fork Coeur d'Alene River near Pinehurst to for the Coeur d'Alene River. The Coeur D'Alene River flows into Lake Coeur d'Alene just north of the reservation boundary as shown in the figure below. The EPA invite the tribe to review and/or consult on this permit because it the potential of the discharge to impact Lake Coeur d'Alene.

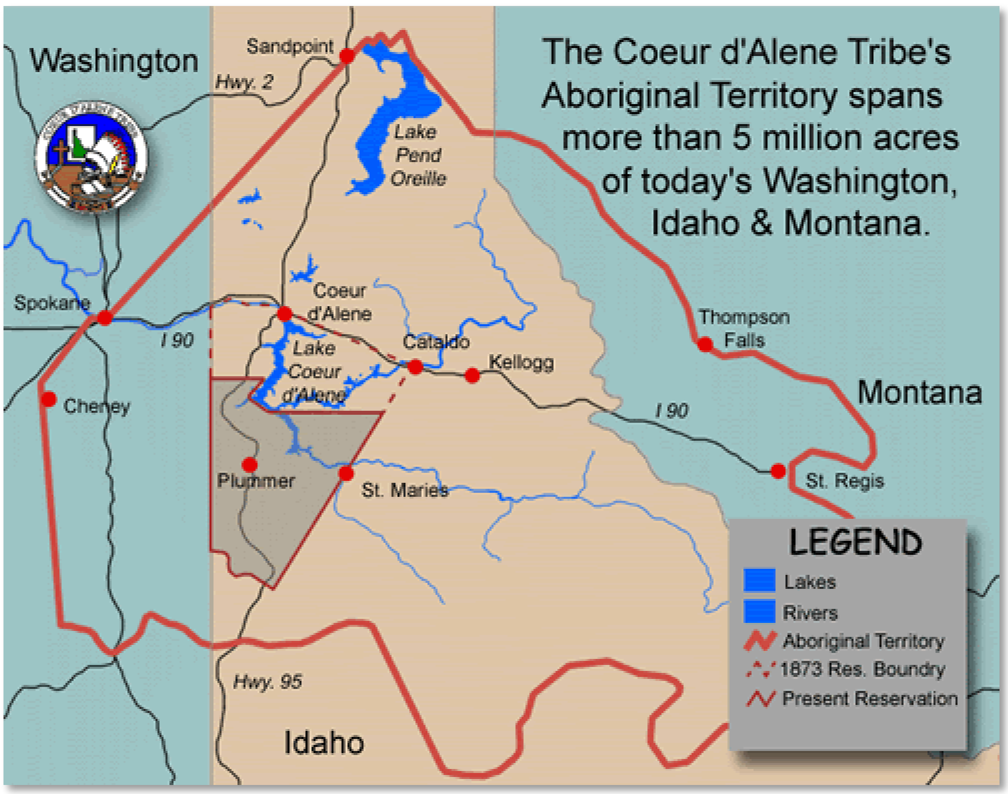


Figure 20. Coeur d'Alene Tribe Boundary[12]

The EPA did not receive comments from the Coeur d'Alene Tribe during their review of the preliminary draft permit.

[12] Source: Coeur d'Alene Tribe Webpage http://www.cdatribe-nsn.gov/

Appendix H: State Certification

The Idaho Department of Environmental Quality provided the draft §401 Water Quality Certification on December 28, 2012. The Idaho Department of Environmental Quality provided the final §401 Water Quality Certification on July 15, 2013.

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.

DEQ certified 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.