Fact Sheet

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

The City of Rigby
Wastewater Treatment Plant

Public Comment Start Date: July 20, 2016
Public Comment Expiration Date: August 19, 2016

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206-553-8257
800-424-4372, ext. 8257 (within Alaska, Idaho, Oregon and Washington)
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The EPA Proposes To reissue NPDES Permit
The EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

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

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

Regional Administrator
Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 N. Skyline Drive, Suite B
Idaho Falls, ID 83402

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

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

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

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-191
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

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

Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 N. Skyline Drive, Suite B
Idaho Falls, ID 83402
(208) 528-2650

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
ACR	Acute-to-Chronic Ratio
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
BOD_{5u}	Biochemical oxygen demand, ultimate
BMP	Best Management Practices
BPT	Best Practicable
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
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
FDF	Fundamentally Different Factor
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
LTCP	Long Term Control Plan
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
MF	Membrane Filtration
MPN	Most Probable Number
N	Nitrogen
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System

NSPS	New Source Performance Standards
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
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
UV	Ultraviolet
WET	Whole Effluent Toxicity
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit

Water Quality Standards	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:

Facility Name:	City of Rigby Wastewater Treatment Plant
Mailing Address:	158 W. Fremont Avenue, Rigby, Idaho 83442
Facility Address:	3939 East 500 North, Rigby, Idaho
Contact:	Scott Humpherys, Chief Operator, City of Rigby, Wastewater Treatment Plant 208-569-7541

B. Permit History

The most recent NPDES permit for the Rigby Facility was issued on June 15, 2005, became effective on August 1, 2005, and expired on July 31, 2010.

The permittee submitted an NPDES application for permit renewal, which the EPA received on February 1, 2010. The EPA determined that the application was timely and complete, as of the receipt date. Therefore, pursuant to 40 CFR 122.6., the permit was administratively extended and remains fully effective and enforceable.

However, the application reported construction of a new wastewater treatment plant, and the EPA requested additional information because the design flow for the new facility was over 1.0 million gallons per day (mgd). By letter of February 9, 2012, the EPA informed the City of Rigby that the additional information was acceptable; and accordingly, the permit remained fully effective and enforceable.

II. Facility Information

A. Treatment Plant Description

Service Area

The City of Rigby owns and operates the City of Rigby Wastewater Treatment Plant (WWTP) located in Rigby, Idaho. The collection system has a separate sanitary sewer system. The facility serves a resident population consisting of 3,394.

Treatment Process

The design flow of the facility is 2.59 mgd on an average day maximum monthly basis. The new wastewater treatment plant was substantially complete by the end of 2010. The primary treatment process consists of screening and grit removal followed by parallel oxidation ditches. Disinfection is by ultra violet radiation (UV). Because the discharge is over 1.0 mgd, the facility is considered a major facility.

B. Background Information

Effluent Characterization

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, additional discharge data, and the nature of the discharge. Pollutants typical of a sewage treatment plant are five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), *E. coli* bacteria, pH and ammonia. Based on this analysis, pollutants of concern are as follows:

- BOD_5
- TSS
- *E. coli* bacteria
- pH
- Ammonia

The concentrations of pollutants in the discharge were reported in the NPDES application and in DMRs and were used in determining reasonable potential for several parameters (see Appendix D and E).

Compliance History

The EPA reviewed the last five plus years of effluent monitoring data (January 2010 through July 2015) from the discharge monitoring report (DMR).

Overall, the facility has had a good compliance record. Only one violation was found. Monthly removal of BOD_5 was 82 percent during April 2010, compared to the minimum monthly limit of 85 percent. No violations were detected since then.

III. Receiving Water

This facility discharges to Dry Bed Creek tributary to the Snake River.

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 used ambient flow data collected at the Station USGS 13038000 DRY BED NR RIRIE ID to calculate the low flow conditions for the Dry Bed Creek at Rigby. This USGS Station is about 8 miles upstream of the City of Rigby WWTP, but the only other USGS station on Dry Bed Creek lies downstream and is inactive.

Because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the 30B3 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Idaho WQS recommend the 30Q5 flow rate for non-

carcinogens, and the harmonic mean flow rate for carcinogens. (see Appendix C of this fact sheet for additional information on flows).

B. Receiving Water Quality

The EPA reviews receiving water quality data when assessing the need for and developing water quality based effluent limits. In granting assimilative capacity of the receiving water, the EPA must account for the amount of the pollutant already present in the receiving water. In situations where some of the pollutant is actually present in the upstream waters, an assumption of "zero background" concentration overestimates the available assimilative capacity of the receiving water and could result in limits that are not protective of applicable water quality standards.

Receiving water data were available from ambient monitoring required in the existing permit. Table 1 summarizes the receiving water data used to evaluate the need for and develop water quality based effluent limits.

Table 1: Receiving Water Quality Data

Parameter	Units	Percentile	Value	
			Summer	Winter
Temperature	°C	95th	19.4	17.0
pH	Standard units	95th	8.93	8.64
Ammonia	mg/L	95th	0.1	0.1

C. Water Quality Standards

Overview

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limitations in permits necessary to meet water quality standards. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States. A State's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria and an anti-degradation policy.

The use classification system designates the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Designated Beneficial Uses

This facility discharges to Dry Bed Creek, which eventually flows into the Snake River, Idaho Falls Subbasin, HUC 17040201, Water Body Unit US-20. Dry Bed Creek is undesignated. The surface water quality standards state at IDAPA 58.01.02.101.01:

Undesignated Surface Waters. Surface waters not designated in Sections 110 through 160 shall be designated according to Section 39-3604, Idaho Code, taking into consideration the use of the surface water and such physical, geological, chemical, and biological measures as may affect the surface water. Prior to designation, undesignated waters shall be protected for beneficial uses, which includes all recreational use in and on the water and the protection and

propagation of fish, shellfish, and wildlife, wherever attainable.

Because the EPA presumes most waters in Idaho will support cold water aquatic life and primary or secondary contact recreation beneficial uses, the EPA will apply cold water aquatic life and primary or secondary contact recreation criteria to Dry Bed Creek.

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

Surface Water Quality Criteria

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

- The narrative criteria applicable to all surface waters of the State are found at IDAPA 58.01.02.200 (General Surface Water Quality Criteria).

- The numeric criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at IDAPA 58.01.02.210 (Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use).

- Additional numeric criteria necessary for the protection of aquatic life can be found at IDAPA 58.01.02.250 (Surface Water Quality Criteria for Aquatic Life Use Designations).

- Numeric criteria necessary for the protection of recreation uses can be found at IDAPA 58.01.02.251 (Surface Water Quality Criteria for Recreation Use Designations).

- Water quality criteria for agricultural water supply can be found in the EPA's *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA R3-73-033) (See IDAPA 58.01.02.252.02)

The numeric and narrative water quality criteria applicable to Snake River at the point of discharge are provided in Appendix B of this fact sheet.

Antidegradation

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

D. Water Quality Limited Waters

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

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

Based on a review of Idaho's Integrated Report Dry Bed Creek is not limited for any pollutant. No TMDLs apply to Rigby as stated by IDEQ in an email dated October 3, 2015 from Troy Saffle, Regional Manager, Idaho Falls Office, Department of Environmental Quality to John Drabek, EPA Region 10.

"We haven't assessed the AU containing the City's outfall. Assessment Unit ID17040201SK004_06 appears as "unassessed" on the 2012 Integrated Report. There are no WLAs existing or proposed."

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits. The basis for the effluent limits proposed in the draft permit is provided in Appendix D.

B. Proposed Effluent Limitations

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

Narrative Limitations to Implement Idaho's Narrative Criteria for Floating, Suspended or Submerged Matter

The permittee must not discharge floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.

Numeric Limitations

Table 2 below presents the proposed effluent limits for Five Day Biochemical Oxygen Demand (BOD_5), TSS, *E. coli*, pH and ammonia.

Table 2: Proposed Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
BOD_5	mg/L	30	45	---
	lbs/day	648	972	---
BOD_5 Removal	percent	85 minimum	---	---
Total Suspended Solids (TSS)	mg/L	30	45	---
	lbs/day	648	972	---
TSS Removal	percent	85 minimum	---	---
E. coli	#/100 ml	126 (geometric mean)	---	460
pH	standard units	6.5 – 9.0		
Total Ammonia as N (5/1 – 9/30) (as N)[1]	mg/L	4.3	---	12.6
	lbs/day	93	---	272
Total Ammonia as N (10/1 – 4/30) (as N)[1]	mg/L	0.65	---	1.7
	lb/L	14	---	37

[1]Limit beginning June 1, 2019

Changes in Effluent Limits from the previous permit are shown in Table 4.

Table 4. Changes in Permit Effluent Limits		
Parameter	**Existing Permit**	**Draft Permit**
BOD_5 Average Monthly Limit	133 lbs/day	648 lbs/day
BOD_5 Average Weekly Limit	199 lbs/day	972 lbs/day
TSS Average Monthly Limit	133 lbs/day	648 lbs/day
TSS Average Weekly Limit	199 lbs/day	972 lbs/day
Total Residual Chlorine, Average Monthly Limit	9.2 µg/L	Switched to UV disinfection
Total Residual Chlorine, Maximum Daily Limit	17.5 µg/L	Switched to UV disinfection
Total Ammonia as N (5/1 – 9/30) (as N)	none	4.3 AML/12.6 MDL mg/L
Total Ammonia as N (10/1 – 4/30) (as N)	none	0.65 AML/1.7 MDL mg/L
Total Ammonia as N (5/1 – 9/30) (as N)	none	93 AML/272 MDL lbs/day
Total Ammonia as N (10/1 – 4/30) (as N)	none	14 AML/37 MDL lbs/day

C. Compliance Schedules

Compliance schedules are authorized by federal NPDES regulations at 400 CFR 122.47 and Idaho WQS at IDAPA 58.01.02.400.03. Compliance schedules allow a discharger to phase in, over time, compliance with water quality-based effluent limitations when limitations are in the permit for the first time. Additionally, the federal regulations at 40 CFR 122.47 require that the compliance schedules require compliance with effluent limitations as soon as possible and that, when the compliance schedule is longer than 1 year, the schedule shall set forth interim requirements and the dates for their achievement. The time between the interim dates shall generally not exceed 1 year, and when the time necessary to complete any interim requirement is more than one year, the schedule shall require reports on progress toward completion of these interim requirements. 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 (see 40 CFR 122.47 (a). The EPA has found that a compliance schedule is appropriate for total ammonia.

A reasonable potential calculation showed that the Rigby discharge would have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia. Therefore, the draft permit contains water quality-based effluent limits for ammonia.

The proposed effluent limits and 95th percentile values since the January, 2011 upgrade are shown below:

Ammonia Effluent		
Season	**Limit**	**95th Percentile Since Upgrade**
Average Monthly Summer	4.3 mg/L	7.21 mg/L
Average Monthly Winter	0.65 mg/L	15.7 mg/L

A review of the data shows that the permittee will not be able to meet the limits upon the effective date of the permit. Therefore, a compliance schedule is appropriate. See Appendices D and E for the reasonable potential and effluent limit calculations for ammonia.

The permit requires the facility to meet final effluent limits in six years and seven months. The time is required to obtain funding, allow proper evaluation of alternatives in the facilities planning process and approval by the Idaho Department of Environmental Quality. Pursuant to 40 CFR 122.47(a)(3), a permit with a compliance schedule must have interim requirements and dates for achievement. EPA has included interim requirements, dates for their achievement and reports of progress.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

The permit also requires the permittee to perform effluent monitoring required by Parts B.6 and Part D of the NPDES Form 2A application, so that these data will be available when the permittee applies for a reissuance of its NPDES permit.

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the EPA.

B. Effluent Monitoring

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

Table 5 below presents the proposed effluent monitoring requirements in the draft permit. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 5: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	Mgd	Effluent	Continuous	recording
BOD_5	mg/L	Influent & Effluent	2/week	24-hour composite
	lbs/day	Influent & Effluent	2/week	calculation[1]
	% Removal	--	--	calculation[2]
TSS	mg/L	Influent & Effluent	2/week	24-hour composite
	lbs/day	Influent & Effluent	2/week	calculation[1]
	% Removal	--	--	calculation[2]
pH	standard units	Effluent	5/week	grab
E. Coli	#/100 ml	Effluent	5/month	grab
Total Ammonia as N	mg/L	Effluent	1/week	24-hour composite
	lbs/day	Effluent		calculation[1]
NPDES Application Form 2A[3].	---	Effluent	3x/5 years	---
NPDES Application Form 2A, Part D Expanded Effluent Testing[4]	---	Effluent	Annual[4]	---

Notes:
1. Loading is calculated by multiplying the concentration (in mg/L) by the flow (in mgd) on the day sampling occurred and a conversion factor of 8.34.
2. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month, i.e.:
   (average monthly influent – average monthly effluent) ÷ average monthly influent.
   Influent and effluent samples must be taken over approximately the same time period.
3. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6.
4. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part D
   Annual testing shall be conducted on a rotating quarterly schedule, so that each annual test is conducted during a different quarter than the previous year's test.

Monitoring Changes from the Previous Permit

Monitoring frequencies for certain parameters have been reduced, relative to the previous permit. Chlorine disinfection ended and the chlorine system removed therefore chlorine monitoring is discontinued. Total phosphorus and temperature monitoring are discontinued. Surface water monitoring is discontinued for flow, total phosphorus and ammonia. Monitoring to assess reasonable potential under the copper Biotic Ligand Model (BLM) criteria is added. Surface monitoring meeting the requirements of NPDES Application Form 2A, Part B.6., Effluent Testing Data and Form 2A, Part D, Expanded Effluent Testing is

added to the permit to ensure the data are available for the next permit reissuance. Toxicity testing is added to the permit.

C. Surface Water Monitoring

The permittee must conduct surface water monitoring. Surface water monitoring must start six months after the effective date of the permit and continue until the permit is reissued. The program must meet the following requirements:

1. Monitoring stations must be established in Dry Bed Creek at the following location:

   Above the influence of the facility's discharge

2. The permittee must seek approval of the surface water monitoring stations from IDEQ.
3. A failure to obtain IDEQ approval of surface water monitoring stations does not relieve the permittee of the surface water monitoring requirements of this permit.
4. To the extent practicable, surface water sample collection must occur on the same day as effluent sample collection.
5. Samples must be analyzed for the parameters listed in *Table 6. Surface Water Monitoring Requirements.*
6. For all surface water monitoring, the permittee must use sufficiently sensitive analytical methods which meet the following:
   a) The method must detect and quantify the level of the pollutant, or
   b) The permittee must use a method that can achieve MLs less than or equal to those specified in Appendix A of the permit. The permittee may request different MLs. The request must be in writing and must be approved by EPA.

Table 6. Surface Water Monitoring Requirements

Parameter	Units	Frequency	Sample Type
Copper	µg/L	Quarterly	Grab
Dissolved Organic Carbon (DOC)	mg/L	Quarterly	Grab
pH	Standard Units	Quarterly	Grab
Temperature	°C	Quarterly	Grab
Hardness	mg/L	Quarterly	Grab
Conductivity	umhos/cm	Quarterly	Grab

Notes:
1. For quarterly monitoring frequency, quarters are defined as: January 1 to Mach 31; April 1 to June 30; July 1 to September 30; and, October 1 to December 31.
2. Copper, DOC, pH, hardness and conductivity must be collected on the same day.

7. Quality assurance/quality control (QA/QC) plans for all the monitoring must be documented in the Quality Assurance Plan required under Part II.B

8. Samples for copper, dissolved organic carbon and conductivity must be collected on the same day.
9. Submission of SW Monitoring
    a) Surface water monitoring results must be reported on the monthly DMR.
    b) In addition, the permittee must submit all surface water monitoring results for the previous calendar year for all parameters in an annual report to EPA IDEQ by January 31st of the following year and with the application (see Part V.B. of this permit, *Duty to Reapply*). The file must be in the format of one analytical result per row and include the following information: name and contact information of laboratory, sample identification number, sample location in latitude and longitude (decimal degrees format), method of location determination (i.e., GPS, survey etc.), date and time of sample collection, water quality parameter (or characteristic being measured), analysis result, result units, detection limit and definition (i.e., MDL etc.), analytical method, date completed, and any applicable notes.

The permit includes new surface water quality monitoring requirements to evaluate the impact of the discharge with copper criteria. IDEQ intends to adopt new copper criteria in 2017 that incorporates the BLM. The BLM is a metal bioavailability model that uses receiving water body characteristics and monitoring data to develop site-specific water quality criteria. Input data for the BLM include: temperature, pH, dissolved organic carbon (DOC), major cations (Ca, Mg, Na, & K), major anions (SO4 & Cl), alkalinity, and sulfide. EPA's 2007 aquatic life freshwater quality criteria for copper is based on the Biotic Ligand Model (BLM). EPA is currently updating these BLM criteria.

The BLM is most sensitive to DOC and pH. The remaining parameters may be estimated using conductivity measurements. The surface water data will be used to assess reasonable potential under the copper BLM criteria. Additional information may be found on the EPA website at: http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/copper/

D. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) tests are laboratory tests that measure the total toxic effect of an effluent on living organisms. Whole effluent toxicity tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. There are two different types of toxicity test: acute and chronic. An acute toxicity test is a test to determine the concentration of effluent or ambient waters that causes an adverse effect (usually death) on a group of test organisms during a short-term exposure (e.g., 24, 48, or 96 hours). A chronic toxicity test is a short-term test, usually 96 hours or longer in duration, in which sublethal effects (e.g., significantly reduced growth or reproduction) are usually measured in addition to lethality. Both acute and chronic toxicity are measured using statistical procedures such as hypothesis testing (i.e., no observable effect concentration, NOEC and lowest observable effect concentration, LOEC) or point estimate techniques (i.e., lethal concentration to 50 percent of organisms, $LC_{50;}$ and inhibition concentration in a biological measurement to 25 percent of organisms, IC_{25}).

Federal regulations at 40 CFR §122.44(d) (1) require that NPDES permits contain limits on whole effluent toxicity when a discharge causes, has the reasonable potential to cause, or

contributes to an excursion above a State's numeric or narrative water quality criteria for toxicity. In Idaho, the relevant water quality standards for toxicity states that surface waters of the State shall be free from toxic substances in concentrations that impair designated beneficial uses. Since Idaho does not have numeric water quality criteria for toxicity, the EPA Region 10 uses the Toxic Units (TU) approach for acute (0.3 TUa) and chronic criteria (1 TUc). The use of TU as a mechanism for quantifying instream toxicity when a State lacks numeric criteria is described in Sections 2 and 3 of the 1991 Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) (TSD).

The current permit does not contain effluent limitations because the EPA has determined that the discharge does not have the reasonable potential to cause or contribute to an excursion above Idaho's narrative criteria for toxicity. As a result, the EPA is not including an effluent limitation for WET in this permit reissuance. However, the EPA is requiring WET monitoring for chronic toxicity**.** The rationale for the EPA's reasonable potential determination and WET monitoring requirements are provided below.

Rationale for Reasonable Potential Determination:

When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criteria for toxicity, the permitting authority can use a variety of factors and information. Some of these factors include, but are not limited to, the amount of available dilution, type of industry or POTW, existing data, type of receiving water and designated uses and history of compliance.

Existing Data

Table 6 summarizes the results from toxicity testing from the previous permit term..

Table 6
Whole Effluent Toxicity Testing Results

Date	Species	Lowest Observed Effect Concentration (LOEC) (Percent Effluent)	No Observable Effect Concentration (NOEC) (Percent Effluent)
6/15-18/2010 acute	*Ceriodaphnia dubia*	100%	100%
6/15-18/2010 acute	Fat head minnow	100%	100%
10/6-10/2010 acute	*Ceriodaphnia dubia*	100%	100%
10/6-10/2010 acute	fathead minnow	100%	100%
6/28/2011-7/2/2011 acute	*Ceriodaphnia dubia*	100%	100%
6/28/2011-7/2/2011 acute	fat head minnow	100%	100%

Type of POTW

There are no significant industrial users under 40 CFR Part403.3(t). Significant discharges are defined as discharging more than 25,000 gallons per day of process wastewater to a POTW. No pollutant was detected by the 126 pollutant scan required by Application 2A, Part D. Given the existing data that indicates that the effluent does not contain individual toxics, the type of POTW in question and only one violation since the upgrade the EPA has determined that the Rigby WWTP does not have a reasonable potential to cause or contribute to an excursion above Idaho's water quality standard for toxics. Therefore, an effluent limitation for WET is not included in this permit reissuance.

Rationale for WET Monitoring:

As previously mentioned, the EPA is requiring WET monitoring for chronic toxicity in this permit reissuance. Section 3.3 of the TSD recommends that WET monitoring be repeated at a frequency of at least once every five years. Applications for reissuance of NPDES permits for POTWs greater than or equal to 1.0 MGD require at a minimum quarterly testing for a 12-month period within the last year of the expiration date or one test each year in the last four and one-half years of the permit. To account for seasonal variability, the EPA is requiring alternate quarterly monitoring each year for the term of the permit.

Section 3.3 of the TSD recommends that a discharger conduct chronic toxicity testing if the dilution of the effluent is less than 100:1 at the edge of the mixing zone. The dilution ratio of the effluent is 1.026 acute and 1.0348 chronic. Therefore, the EPA is requiring WET monitoring for chronic toxicity only.

D. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically beginning with the submission of the November DMR (due December 20, 2016), 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. Under NetDMR, all reports required under the permit are submitted to 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 EPA.

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

VI. Sludge (Biosolids) Requirements

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

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-

implementing, which means that facilities must comply with them whether or not a permit has been issued.

VII. Other Permit Conditions

A. Quality Assurance Plan

In order to ensure compliance with the federal regulation at 40 CFR 122.41(e) for proper operation and maintenance, the draft permit requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The City of Rigby is required to update the Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan must include of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the IDEQ upon request.

B. Operation and Maintenance Plan

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

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

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

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

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

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

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

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

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

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

D. Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities." The EPA strives to enhance the ability of overburdened communities to participate fully and meaningfully in the permitting process for EPA-issued permits, including NPDES permits. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. As part of an agency-wide effort, the EPA Region 10 will consider prioritizing enhanced public involvement opportunities for EPA-issued permits that may involve activities with significant public health or environmental impacts on already overburdened communities. For more information, please visit http://www.epa.gov/compliance/ej/plan-ej/ .

As part of the permit development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. The EPA used a nationally consistent geospatial tool that contains demographic and

environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

The Rigby WWTP is not located within or near a Census block group that is potentially overburdened. The draft permit does not include any additional conditions to address environmental justice.

Regardless of whether a facility is located near a potentially overburdened community, the EPA encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the-permit-application-process#p-104). Examples of promising practices include: thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

E. Design Criteria

The permit includes design criteria requirements. This provision requires 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.

F. Industrial Waste Management Requirements

EPA implements and enforces the National Pretreatment Program regulations of 40 CFR 403, per authority from sections 204(b)(1)(C), 208(b)(2)(C)(iii), 301(b)(1)(A)(ii), 301(b)(2)(A)(ii), 301(h)(5) and 301(i)(2), 304(e) and (g), 307, 308, 309, 402(b, 405, and 501(a) of the Federal Water Pollutant Control Act as amended by the CWA of 1977.

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

G. Standard Permit Provisions

Sections **III, IV and V** of the draft permit contain standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife

Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. In an e-mail dated January 21, 2009, NOAA Fisheries stated that there are no threatened or endangered species under NOAA's jurisdiction in the Snake River drainage upstream of the Hells Canyon Dam, which is located at river mile 247.5. The Snake River in the vicinity of Rigby is upstream of river mile 700 and more than 400 miles from the nearest ESA-listed threatened or endangered species under NOAA's jurisdiction. Therefore, the reissuance of this permit will have no effect on any listed threatened or endangered species under NOAA's jurisdiction.

Based on the USFWS no listed species are in Jefferson County. Therefore, the EPA determines the discharges from Rigby will have no effect on listed species.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. There are no designated critical habitats in the vicinity of Rigby. For this reason the City of Rigby discharges will have no effect on EFH.

C. State Certification

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

D. Permit Expiration

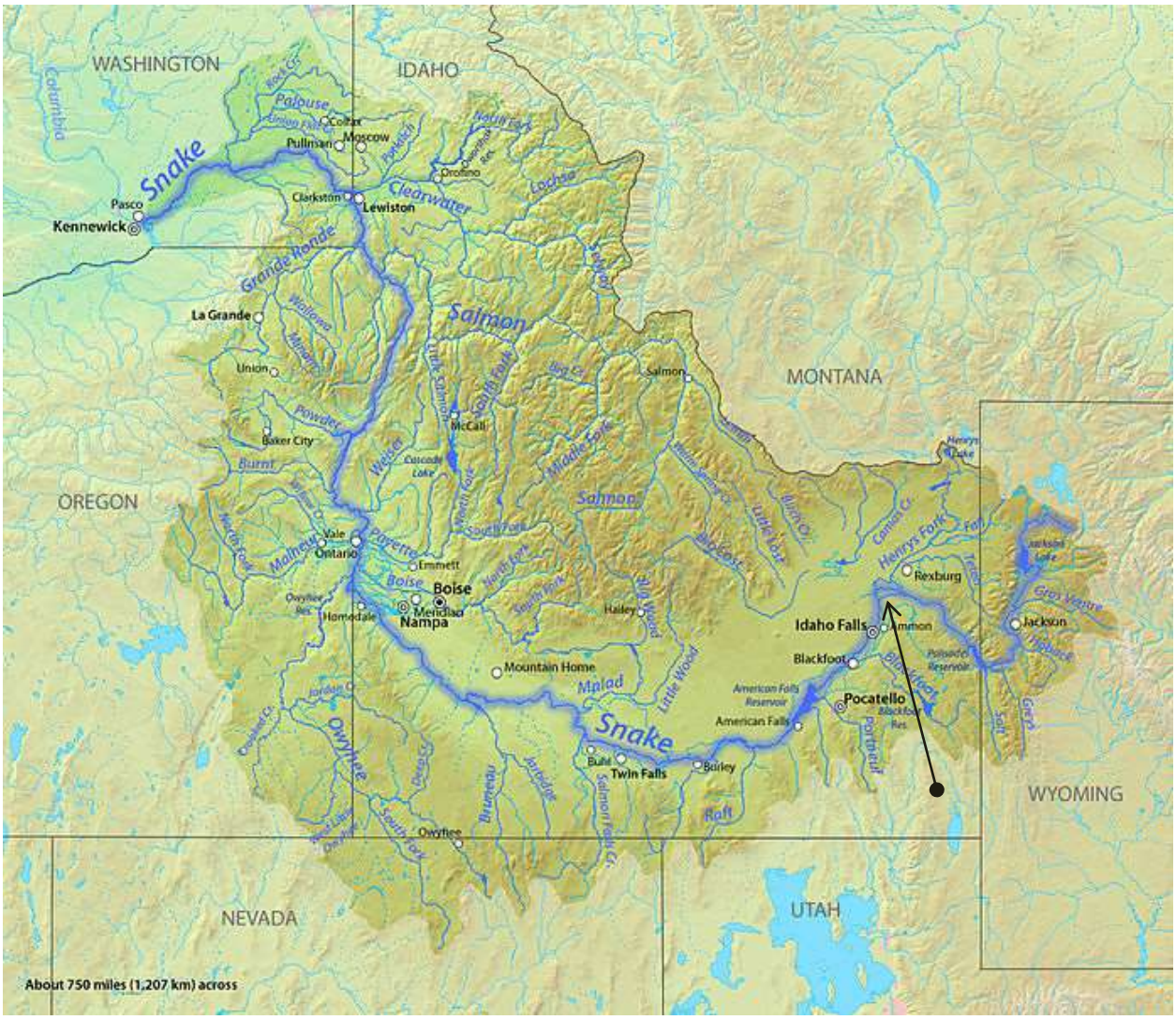
The permit will expire five years from the effective date.

IX. References

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

EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.

Appendix A: Facility Information



Appendix B: Water Quality Criteria Summary

This appendix provides a summary of water quality criteria applicable to the Snake River.

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

A. General Criteria (IDAPA 58.01.02.200)

Surface waters of the state shall be free from:

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

Surface water level shall not exceed allowable level for:

- radioactive materials, or
- sediments

B. Numeric Criteria for Toxics (IDAPA 58.01.02.210)

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

Ammonia

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

1. pH: Within the range of 6.5 to 9.0
2. Total Dissolved Gas: <110% saturation at atm. pressure.
3. Dissolved Oxygen: Exceed 6 mg/L at all times.

4. Ammonia:

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

The City of Rigby has collected pH and temperature data in Dry Bed Creek upstream of the facility from 2005 through 2015. These data were used to determine the appropriate pH and temperature values to calculate the ammonia criteria.

As with any natural water body the pH and temperature of the water will vary over time. Therefore, to protect water quality criteria it is important to develop the criteria based on pH and temperature values that will be protective of aquatic life at all times. The EPA used the 95th percentile of the pH and temperature data for the calculations, which were calculated to be 8.64 and 17.0 in the winter and 8.93 and 19.4 in the summer.

Table B-1: Water Quality Criteria for Ammonia		
	Acute Criterion[1]	**Chronic Criterion**
Equations:	$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$

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

a. Geometric Mean Criterion. Waters designated for primary or secondary contact recreation are not to contain *E. coli* in concentrations exceeding a geometric mean of 126 *E. coli* organisms per 100 ml based on a minimum of 5 samples taken every 3 to 7 days over a 30 day period.

b. Use of Single Sample Values: This section states that 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.). for primary and contact recreation.

Appendix C: Low Flow Conditions and Dilution

A. Low Flow Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits:

Acute aquatic life	1Q10
Chronic aquatic life	7Q10
Carcinogenic human health criteria	harmonic mean flow
Ammonia	30B3
1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 5 years. 2. The 1B10 is biologically based and indicates an allowable exceedence of once every 3 years. 3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 5 years. 4.The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.	

Idaho's water quality standards do not specify a low flow to use for acute and chronic ammonia criteria, however, the EPA's *Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia; Notice* (64 FR 719769 December 22, 1999) identifies the appropriate flows to be used.

The EPA determined critical low flows upstream of the discharge from the following USGS Station: Station USGS 13038000 DRY BED NR RIRIE ID.

The estimated low flows for the station are presented in Table C-1.

Table C-1: Critical Flows

Flows	cfs	
	Summer	Winter
1Q10	209	0.5
7Q10	746	0.67
30B3	1700	33.1
Harmonic Mean	1880	47.1

B. Mixing Zones and Dilution

In some cases a dilution allowance or mixing zone is permitted. 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 (the EPA, 1994). 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.

In the State 401 Certification, the IDEQ proposes to authorize a mixing zone of 25% of the stream flow volume for ammonia.

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

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

Where:

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

The EPA calculated dilution factors for summer and winter critical low flow conditions. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 2.59 mgd. The dilution factors are listed in Table C-2.

Table C-2: Dilution Factors

Flows	Winter	Summer
1Q5	1.031	14.0
7Q5	1.042	47.5
30B3	3.1	107.1
Harmonic Mean	3.8	3.7

Appendix D: Basis for Effluent Limits

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

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table C-1.

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

Parameter	30-day average	7-day average
BOD_5	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
Removal for BOD_5 and TSS (concentration)	85% (minimum)	---
pH	within the limits of 6.0 - 9.0 s.u.	

Mass-Based Limits

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

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

Since the design flow for this facility is 2.59 mgd, the technology based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 2.59 mgd × 8.34 = 648 lbs/day

Average Weekly Limit = 45 mg/L × 2.59 mgd × 8.34 = 972 lbs/day

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

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the water quality standards of all affected States.

The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable water quality standards.

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

Reasonable Potential Analysis

When evaluating the effluent to determine if the pollutant parameters in the effluent are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State/Tribal water quality criterion, the EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. The EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific pollutant, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it may be appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body and will decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the concentration of the pollutant in the receiving water is less than the criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by the State.

The reasonable potential analysis for Rigby was based on a mixing zone of 25% based on the IDEQ's draft certification. If IDEQ revises the allowable mixing zone in its final certification of this permit, reasonable potential analysis will be revised accordingly.

Procedure for Deriving Water Quality-based Effluent Limits

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

1. TMDL-Based Wasteload Allocation

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

To ensure that these waters will come into compliance with water quality standards Section 303(d) of the CWA requires States to develop TMDLs for those water bodies that will not meet water quality standards even after the imposition of technology-based effluent limitations. The first step in establishing a TMDL is to determine the assimilative capacity (the loading of pollutant that a water body can assimilate without exceeding water quality standards). The next step is to divide the assimilative capacity into allocations for non-point sources (load allocations), point sources (wasteload allocations), natural background loadings, and a margin of safety to account for any uncertainties. Permit limitations are then developed for point sources that are consistent with the wasteload allocation for the point source.

No TMDLs apply to Rigby.

2. Mixing zone based WLA

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

3. Criterion as the Wasteload Allocation

In some cases a mixing zone cannot be authorized, either because the receiving water is already at, or exceeds, the criterion, the receiving water flow is too low to provide dilution, or the facility can achieve the effluent limit without a mixing zone. In such cases, the criterion becomes the wasteload allocation. Establishing the criterion as the wasteload allocation ensures that the effluent discharge will not contribute to an exceedance of the criteria. The WLA for ammonia and cadmium were derived using this method.

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

Summary - Water Quality-based Effluent Limits

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

Ammonia

A reasonable potential calculation showed that the Rigby discharge would have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia. Therefore, the draft permit contains a water quality-based effluent limit for ammonia. See Appendices D and E for reasonable potential and effluent limit calculations for ammonia.

pH

The Idaho water quality standards at IDAPA 58.01.02.250.01.a, require pH values of the river to be within the range of 6.5 to 9.0. 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. Effluent pH data were collected daily at the facility from 2009 to 2014, a total of over 1800 samples were collected. The data ranged from 7.0–9.0 standard units. The pH range of the effluent is within the State's water quality criterion of 6.5 – 9.0 standard units, therefore no mixing zone is necessary for this discharge.

E. coli

The Idaho water quality standards state that waters of the State of Idaho, that are designated for recreation, are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a thirty day period. Therefore, the draft permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

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

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

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

with" the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Residues

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

C. Anti-backsliding Provisions

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

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). According to the EPA NPDES Permit Writers' Manual (EPA-833-K-10-001) the 402(o)(2) exceptions are applicable to WQBELs (except for 402(o)(2)(B)(ii) and 402(o)(2)(D)) and are independent of the requirements of 303(d)(4). Therefore, WQBELs may be relaxed as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied.

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

D. Antidegradation

The proposed issuance of an NPDES permit triggers the need to ensure that the conditions in the permit ensure that Tier I, II, and III of the State's antidegradation policy are met. An anti-degradation analysis was conducted by the IDEQ as part of the State's CWA Section 401 certification (see Appendix F).

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

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

A. Reasonable Potential Analysis

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This following section discusses how the maximum projected receiving water concentration is determined

Mass Balance

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

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

where,

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

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

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

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

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

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

Where:

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

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

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

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

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

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

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

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 follows:

$$C_d = \frac{CF \times C_e - C_u}{D} + C_u \qquad \text{Equation 7}$$

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.

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

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's Technical Support Document for Water Quality-based Toxics Controls (TSD, 1991) recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3). To determine the maximum projected effluent concentration (Ce) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter

has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

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

$p_n = (1 - \text{confidence level})^{1/n}$ Equation 8

where,

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

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}}$$ Equation 9

Where,

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

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

$C_e = (RPM)(MRC)$ Equation 10

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

Once the maximum projected effluent concentration is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones is calculated using the mass balance equations presented previously.

Reasonable Potential

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant.

Results of Reasonable Potential Calculations

It was determined that both ammonia and cadmium have reasonable potential to cause or contribute to an exceedance of water quality criteria at the edge of the mixing zone. The results of the calculations are presented at the end of this appendix.

B. WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The draft permit includes WQBELs for ammonia and cadmium. The following discussion presents the general equations used to calculate the water quality-based effluent limits.

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 9 and 10). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation 6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{Equation 11}$$

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, 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 12. The criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \qquad \text{Equation 12}$$

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

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)} \qquad \text{Equation 13}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \qquad \text{Equation 14}$$

where,

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

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

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})} \quad \text{Equation 15}$$

where,

$\sigma_{30}^2 = \ln(CV^2/30 + 1)$

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

Derive the maximum daily and average monthly effluent limits

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

$$MDL = LTA \times e^{(z_m\sigma - 0.5\sigma^2)} \quad \text{Equation 16}$$

$$AML = LTA \times e^{(z_a\sigma_n - 0.5\sigma_n^2)} \quad \text{Equation 17}$$

where σ, and σ² are defined as they are for the LTA equations above, and,

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

z_a = 1.645 (z-score for the 95th percentile probability basis)

z_m = 2.326 (z-score for the 99th percentile probability basis)

n = number of sampling events required per month. With the exception of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 4. For ammonia, In the case of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 30.

The table below detail the calculations for reasonable potential analysis and water quality-based effluent limits.

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Rigby
Design Flow (MGD)	2.59

Dilution Factors	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Seasonal Winter	Seasonal Summer
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	**1.0**	**1.03**	**14.0**
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	**1.0**	**1.0**	**47.5**
Ammonia	**30B3/30Q10** (seasonal)	**4.5**	**3.1**	**107.1**
Human Health - Non-Carcinogen	**30Q5**	**4.7**	**3.9**	**118.3**
Human Health - carcinogen	**Harmonic Mean Flow**	**3.8**	**3.8**	**3.7**

Receiving Water Data		Notes:	Annual Crit. Flows	Seasonal Winter	Seasonal Summer
Hardness, as mg/L $CaCO_3$	*** Enter Hardness on WQ Criteria tab ***	5th % at critical flows			
Temperature, °C	Temperature, °C	95th percentile	19.4	17.0	19.4
pH, S.U.	pH, S.U.	95th percentile	8.85	8.64	8.93

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages present	AMMONIA, default: cold water, fish early life stages present	AMMONIA, default: cold water, fish early life stages present
Effluent Data	**Number of Samples in Data Set (n)**		54	32	22
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		1.24	1.08	1.57
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1,574	15,780.00	7,216.00
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only				
Dilution Factors	Aquatic Life - Acute	1Q10	1.026	1.031	14.041
	Aquatic Life - Chronic	7Q10 or 4B3	-	-	-
	Ammonia	30B3 or 30Q10	4.519	3.065	107.072
	Human Health - Non-Carcinogen	30Q5	-	-	-
	Human Health - carcinogen	Harmonic Mean	-	-	-
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**		100	100	100
	Geometric Mean, µg/L, Human Health Criteria Only				
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	1,131	1,644	989
	Aquatic Life Criteria, µg/L	Chronic	446	733	394
	Human Health Water and Organism, µg/L		--	--	--
	Human Health, Organism Only, µg/L		--	--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--	--	--
		Chronic	--	--	--
	Carcinogen (Y/N), Human Health Criteria Only		--	--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.965	0.879	1.115
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	**99%**	0.918	0.866	0.811
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	**99%**	2.5	2.9	5.0
Statistically projected critical discharge concentration (C_e)			3872.45	46080.63	36100.94
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	3776.12	44689.54	2664.07
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	934.78	15100.49	436.23
Reasonable Potential to exceed Aquatic Life Criteria			**YES**	**YES**	**YES**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4	4
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			4	4	4
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		1.240	1.080	1.570
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		1.240	1.080	1.570
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a-1)$	Acute	1,157.6	1,692.0	12,586.8
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c-1)$	Chronic	1,662.1	2,039.9	31,564.2
Long Term Ave (LTA), ug/L	$WLAc \times \exp(0.5\sigma^2-z\sigma)$, Acute	**99%**	195.4	322.1	1,751.9
(99th % occurrence prob.)	$WLAa \times \exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	**99%**	1,013.1	1,320.0	17,078.1
Limiting LTA, ug/L	used as basis for limits calculation		195.4	322.1	1,751.9
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**424**	**651**	**4,307**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**1,158**	**1,692**	**12,587**
Average Monthly Limit (AML), mg/L			**0.4**	**0.65**	**4.3**
Maximum Daily Limit (MDL), mg/L			**1.2**	**1.7**	**12.6**
Average Monthly Limit (AML), lb/day			**9**	**14.07**	**93**
Maximum Daily Limit (MDL), lb/day			**25**	**37**	**272**

Appendix G: IDEQ Draft 401 Certification

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline, Suite B • Idaho Falls, ID 83402 • (208) 528-2650

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

July 7, 2016

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

RE: Public Comment Draft §401 Water Quality Certification for the draft NPDES Permit # ID-000020010 City of Rigby

Dear Mr. Lidgard:

The State of Idaho Department of Environmental Quality (DEQ) received a revised preliminary draft National Pollutant Discharge Elimination Program (NPDES) permit and draft Fact Sheet and subsequent effluent limits for the city of Rigby's wastewater treatment plant on January 26, 2016.

After review of the limits proposed, DEQ submits the public comment draft § 401 water quality certification containing an antidegradation review.

Please direct any questions to me at: Troy Saffle at 208.528.2650 or troy.saffle@deq.idaho.gov.

Sincerely,

Troy Saffle
Regional WQ Manager
Idaho Falls Regional Office

enclosures (1)

c: Nicole Deinarowicz, TRIM References
John Drabek, EPA R10 Seattle w/enclosures

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

July 7, 2016

NPDES Permit Number(s): ID0020010 City of Rigby Wastewater Treatment Plant

Receiving Water Body: Dry Bed Creek

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

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

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

Antidegradation Review

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

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).

- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

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

Description of Dry Bed Creek

Dry Bed Creek is an historic meander of the Snake River. The Dry Bed Creek, referred to as the "Great Feeder", was the main river channel before the South Fork Snake River moved to its present course in 1902. The Dry Bed Creek is now operated as a feeder canal, utilizing head works to control the flow (Idaho Water Resource Board, 1996). When the irrigation season ends, Dry Bed Creek goes dry from the headgate on the Snake River to below the town of Menan. Between the towns of Menan and Roberts, ground water becomes shallow and re-wets Dry Bed Creek for the remainder of its course to the confluence with the Snake, below Roberts. Photographic documentation is provided in Appendix A capturing the dry stream channel during the non-irrigation season. The antidegradation analysis below addresses protection afforded when Dry Bed Creek is flowing.

Changes in Treatment Capacity and Technology

During the current permit cycle, the City of Rigby wastewater treatment plant (WWTP) upgraded the treatment plant from a lagoon-based treatment system to a mechanical treatment process. This upgrade modified the effluent bacteria removal from chlorine treatment to UV disinfection, and increased the design capacity from 0.53 million gallon per day (mgd) to 2.59 mgd. The technology change for bacteria treatment resulted in the removal of the Total Residual Chlorine (TRC) effluent limit from the current permit to the proposed. This modification also results in increased mass load of pollutants of concern—BOD_5, E. *coli* and TSS. These increases are discussed in the sections below.

Pollutants of Concern

The City of Rigby WWTP discharges the following pollutants of concern: biological oxygen demand (BOD_5), total suspended solids (TSS), E. *coli,* pH, temperature, ammonia, phosphorus, copper and chronic whole effluent toxicity (WET_c). Effluent limits have been developed for BOD_5, TSS, E. *coli,* pH, and ammonia. No effluent limits are proposed for phosphorus, temperature, WET_c, or copper, although monitoring is required, with the exception of phosphorus where monitoring has been discontinued.

Receiving Water Body Level of Protection

The City of Rigby WWTP discharges to the Dry Bed Creek within the Idaho Falls subbasin assessment unit (AU) ID17040201SK004_06 (Dry Bed Creek – source to mouth). Dry Bed Creek is undesignated. DEQ presumes undesignated waters in the state will support cold water

aquatic life and primary or secondary contact recreation beneficial uses; therefore, undesignated waters that are not man-made are protected for these uses (IDAPA 58.01.02.101.01.a). There is no available information indicating the presence of any existing beneficial uses aside from those that are already designated.

According to DEQ's 2012 Integrated Report, this AU is included in Category 3 (Unassessed Waters). Therefore, DEQ must provide an appropriate level of protection on a case-by-case basis using information available at this time (IDAPA 58.01.02.052.05.b). Water quality data collected for the draft NPDES permit indicate no exceedance of temperature, pH or ammonia criteria. DEQ collected bacteria samples from stagnant areas of Dry Bed Creek in March, 2016 and found no instantaneous exceedances of the primary contact recreation trigger value of 406 cfu/100 mL. Additionally, salmonid species of fish use Dry Bed Creek as refuge when water levels are sufficiently high (IDFG, 2009, 2010 and 2012); annual fish salvage operations are conducted when water levels are reduced to unsustainable levels for salmonids. Lastly, Idahoan Foods, Inc. Plant 1 in Lewisville annually collects surface water samples for compliance with their DEQ reuse permit. This sampling, conducted approximately 1.5 miles below the City of Rigby WWTP reported nitrogen and phosphorus levels not sufficiently high to impair Dry Bed Creek. As such, DEQ will provide Tier 2 protection, in addition to Tier 1, for aquatic life and recreation uses (IDAPA 58.01.02.051.02; 58.01.02.051.01).

Protection and Maintenance of Existing Uses (Tier 1 Protection)

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

High-Quality Waters (Tier 2 Protection)

The Dry Bed Creek is considered high quality for aquatic life and contact recreation. As such, the water quality relevant to these uses of the Dry Bed Creek must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to aquatic life and contact recreation uses of the Dry Bed Creek (IDAPA 58.01.02.052.05). These include the following: BOD_5, TSS, E. *coli*, pH, temperature, ammonia, phosphorus, copper and WET_c. Effluent limits are established in the proposed and existing permit for BOD_5, E.*coli*, pH, and TSS. An effluent limit for ammonia is established in the proposed permit; WET_c, is required to be monitored and reported (See EPA's Permit, pages 9-13) and; temperature and copper monitoring is required above the

influence of the outfall. For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.06.a). For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit or license (IDAPA 58.01.02.052.06.a).

Pollutants with Limits in the Current and Proposed Permit: BOD_5, E. coli, pH, TSS

For pollutants that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the City of Rigby WWTP permit, this means determining the permit's effect on water quality based upon the limits for BOD_5, E. *coli, pH,* and TSS in the current and proposed permits. Table 1 provides a summary of the current permit limits and the proposed or reissued permit limits.

Table 1. New and Existing Effluent Limits and Changes in Limits for Outfall 001

Parameters	Units	Draft Permit			2005 Permit (Current)			Change[1]		
		AML[2]	AWL[3]	MDL[4]	AML	AWL	MDL	AML	AWL	MDL
		Pollutants with limits in the proposed permit								
Biochemcial Oxygen Demand (BOD_5)	mg/L	30	45	---	30	45	---	NC	NC	---
	lbs/day	648	972	---	133	199	---	I	I	---
BOD_5 Percent Removal	%	85% minimum	--	---	No limits Monitor and report			N	---	---
Total Suspended Solids (TSS)	mg/L	30	45	---	30	45		NC	NC	---
	lbs/day	648	972	---	133	199		I	I	---
TSS Percent Removal	%	85% minimum	---	---	---	---	---	N	---	---
E. *coli*	CFU/100 mL	126	---	406[5]	126	---	406	NC	---	NC
pH	standard units	Between 6.5-9.0						NC	NC	NC
Total ammonia (as N) May 1-September 30[6]	mg/L	4.3	---	12.6	No limits Monitor and report			N	---	N
	lbs/day	93	---	272				N	---	N
Total ammonia (as N) October 1- April 30	mg/L	0.65	---	1.7	No limits Monitor and report			N	---	N
	lbs/day	14	---	37				N	---	N
		Pollutants with no limits in both the current and proposed permit								
Copper	mg/L	No Limits. Monitor and report only	---	---				N		
Whole Effluent Toxicity (WET)	TUc[7]	No limits Monitor and report	---	---				N		
Temperature	°C	No Limits. Monitor and report only	---	---				N		

[1] Change defined as: I-increased limit, D-decreased limit, NC-no change from current permit, N-new in draft permit
[2]AML is Average Monthly Limit
[3]AWL is Average Weekly Limit
[4]MDL is Maximum Daily Limit
[5]Instantaneous value
[6]Final limit achieved by August 1, 2021
[7]TUc is Toxicity Units, chronic

The concentration based effluent limits for BOD_5, E. *coli,* pH, and TSS in the proposed permit are the same as the previous permit. However, the increased capacity of the WWTP results in increased loads for BOD_5, E. *coli* and TSS. Therefore, the new permit will result in some level of degradation.

If the degradation is deemed insignificant, however, then no further Tier 2 analysis is required (IDAPA 58.01.02.52.08.a.iii). Degradation may be deemed insignificant if the discharge results in a cumulative decrease in assimilative capacity of ten percent (10%) or less (IDAPA 58.01.02.52.08.a.i). Table 2 displays the loss of assimilative capacity for these pollutants. Using the 7Q10 flow values for the summer critical flow, there is less than a 10 percent loss in assimilative capacity and DEQ has determined the degradation to be insignificant. A full explanation of those calculations can be found in Appendix B.

Table 2: Dry Bed Creek Change in Assimilative Capacity for Existing Limits

Dry Bed Creek Summer Critical Flow (7Q10) 746 cfs										
		Draft Permit (2016)			2005 Permit (Current)			% change in Assimilative Capacity		
Parameters	units	AML	AWL	MDL	AML	AWL	MDL	AML	AWL	MDL
BOD_5	mg/L	30	45	---	30	45	---	0.4%	0.4%	---
	lbs/d	648	972	---	133	199	---			
TSS	mg/L	30	45		30	45		0.4%	0.4%	---
	lbs/d	648	972	---	133	199				
E. *coli*	CFU/100 mL	126	---	406	126	---	406	0.4%	---	0.4%

New Permit Limits for Pollutants Currently Discharged: Ammonia

When new limits are proposed in a reissued permit for pollutants in the existing discharge, the effect on water quality is based upon the current discharge quality and the proposed discharge quality resulting from the new limits. Current discharge quality for pollutants that are not currently limited is based upon available discharge quality data (IDAPA 58.01.02.052.06.a.i). Future discharge quality is based upon proposed permit limits (IDAPA 58.01.02.052.06.a.ii).

The proposed permit for the City of Rigby WWTP includes new limits for ammonia (Table 1). DEQ compared the water quality resulting from the existing level of ammonia discharged (based upon discharge monitoring report data) and the water quality resulting from the proposed ammonia effluent limits. The limits proposed are calculated using pH and temperature data collected near the WWTP, and represent the 95- percentile of all existing pH and temperature data. This data includes values measured after the 2008 upgrades to the WWTP. The May-September limit represents a 5% decrease in assimilative capacity, while the October-April limits

represent an increase in assimilative capacity of 1300% (Table 3). The 5% degradation is less than the 10% threshold established by DEQ for significant degradation. Therefore, the new limits proposed result in no significant degradation with respect to ammonia. A full explanation of those calculations can be found in Appendix C.

Table 3: Dry Bed Creek Change in Assimilative Capacity for Ammonia

		Ammonia Average Monthly Limit		
Parameters	**units**	**Ammonia Average Monthly Limit AML**	**Current Discharge 95% Percentile since upgrade**	**% change in Assimilative Capacity[1]**
Total ammonia (as N) May 1-September 30	**mg/L**	4.3	7.21	5%
Total ammonia (as N) October 1- April 30	**mg/L**	0.65	15.7	-1300%

[1]**Negative values indicate an INCREASE in Assimilative Capacity**

Pollutants with No Limits: Temperature, Phosphorus, WET_c and Copper

There are four pollutants of concern relevant to Tier 2 protection of aquatic life that currently are not limited and for which the proposed permit also contains no limit: temperature, phosphorus, WET_c and copper. Temperature and phosphorus effluent monitoring was found to be unnecessary in the proposed permit cycle. Effluent water monitoring is proposed for WET_c due to the upgrade in the facility above 1 mgd. Surface water monitoring, above the impact of the outfall, is required for copper, including constituents required for the Biotic Ligand Model (BLM). Using the BLM requires the collection of copper and also dissolved organic carbon, hardness and conductivity. Temperature monitoring is only required upstream of the outfall as part of the surface water monitoring requirements. For such pollutants without effluent limits, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.04.a.ii). The City of Rigby WWTP increased design flows from 0.53 mgd to 2.59 mgd. There have been no new connections to the City of Rigby WWTP which may have increased levels of these pollutants. However, the increase in design flow may increase the concentration of these pollutants at the edge of a mixing zone. A Tier 2 analysis, however, is only required if the degradation is significant; this only occurs when the discharge of the pollutant will cumulatively decrease the assimilative capacity by more than 10%. There is no information available concerning current levels of WET_c or copper concentration, either in Dry Bed Creek or the City of Rigby WWTP's effluent, therefore making the assimilative capacity analysis impossible to complete. The proposed permit requires monitoring of these pollutants. The next permit cycle will include the assimilative capacity evaluation, once the existing levels of each pollutant are known.

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

Mixing Zones

Pursuant to IDAPA 58.01.02.060, DEQ authorizes a mixing zone that utilizes 25% of the critical flow volumes of Dry Bed Creek for ammonia.

Compliance Schedule

Ammonia limit compliance will require modifications to the City of Rigby WWTP. EPA considered these upgrades and proposed a schedule of compliance with interim tasks related to planning, funding and modifying the WWTP and outlined them in the draft permit. DEQ authorizes this compliance schedule pursuant to IDAPA 58.01.02.400.03, except that the City of Rigby WWTP must comply with the final ammonia limits by **August 1, 2023**.

Other Conditions

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

Right to Appeal Final Certification

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

Questions or comments regarding the actions taken in this certification should be directed to Troy Saffle, Idaho Falls Regional Office at 208.528.2650 or troy.saffle@deq.idaho.gov.

DRAFT

Eric Neher
Regional Administrator
Idaho Falls Regional Office

References

Idaho Water Resources Board. December 13, 1996. Comprehensive State Water Plan SWP: South Fork Snake River Basin.

Idaho Department of Fish and Game. 2009, 2010, 2012. Annual Fisheries Report. https://collaboration.idfg.idaho.gov/FisheriesTechnicalReports/Forms/AllItems.aspx

Appendix A: Photographic Documentation of Dry Bed Creek

Figure 1 Great Feeder Diversion Maintenance 2016

Figure 2 Dry Bed Creek at Ririe

Figure 3 Dry Bed Creek between Ririe and Rigby

Figure 4 Rigby Outfall into Dry Bed Creek Depression (Outfall Flow approx. 0.3 mgd)

Figure 5 Dry Bed Creek at Menan

Figure 6 Dry Bed Creek at Roberts

Appendix B: Antidegradation calculations for Pollutants of Concern with Increase Loads

Three pollutants had no change in the effluent limits, but do have increasing mass limits. Table B displays the results of insignificant degradation for BOD_5, TSS and E. *coli.* These limits are technology based and part of all municipal waste water treatment plants and identify the minimum levels of effluent quality for these pollutants

Table B: Dry Bed Creek Change in Assimilative Capacity for Existing Limits

Dry Bed Creek Summer Critical Flow (7Q10) 746 cfs										
		Draft Permit (2016)			2005 Permit (Current)			% change in Assimilative Capacity		
Parameters	units	AML	AWL	MDL	AML	AWL	MDL	AML	AWL	MDL
BOD_5	mg/L	30	45	---	30	45	---	0.4%	0.4%	---
	lbs/d	648	972	---	133	199	---			
TSS	mg/L	30	45		30	45		0.4%	0.4%	---
	lbs/d	648	972	---	133	199				
E. *coli*	CFU/100 mL	126	---	406	126	---	406	0.4%	---	0.4%

These values were calculated using DEQ's draft Antidegradation Guidance Document (2012). The calculations for each pollutant are below.

BOD_5 and TSS Percentage Change in Assimilative Capacity

Technology based limits for these pollutants are the same, at 30 mg/L and 45 mg/L respectively. Because the loading increases due to design capacity upgrades, degradation will occur. DEQ quantifies degradation by the percentage loss of assimilative capacity through the following equations and input parameters:

Background concentrations: 0 mg/L
Effluent Limits: 30 mg/L (AML) and 45 mg/L (AWL)
Remaining assimilative capacity: 30 mg/L (AML) and 45 mg/L (AWL)
10% of remaining assimilative capacity: 3.0 mg/L (AML) and 4.5 mg/L (AWL)
Increase in design flow: 0.53 mgd (0.82 cfs) to 2.59 mgd (4.0 cfs)
Receiving water flow: 746 cfs

Current Mixed Concentration: 0.03 mg/L (AML)
Proposed Mixed Concentration: 0.16 mg/L (AML)

0.16 – 0.03 = 0.13 mg/L (0.43%) is the reduction in assimilative capacity for the AML

Current Mixed Concentration: 0.05 mg/L (AWL)
Proposed Mixed Concentration: 0.24 mg/L (AWL)

0.24-0.05 = 0.19 mL (0.42%) is the loss of assimilative capacity for the AWL

Formula used to calculate mixed concentrations:

Mixed Concentration = Cm = [(Ce * Qe) +(Cu * Qu)] / (Qe+Qu)

Where:

Cm = Mixed Concentration (µg/L)
Ce = Effluent Concentration (µg/L)
Qe = Effluent Volume (liters, calculated as flow rate in cfs * constant 28.316)
Cu = Upstream concentration (µg/L)
Qu = Upstream Volume (liters, calculated as flow rate in cfs * constant 28.316)

E. *coli* Percentage Change in Assimilative Capacity

Water quality based limits for E. *coli* are 126 cfu/100 mL (AWL) and 406 cfu/100 mL (MDL) respectively.

Because the loading increases due to design capacity upgrades, degradation will occur. DEQ quantifies degradation by the percentage loss of assimilative capacity through the following equations and input parameters:

Background concentrations: 0 cfu/100mL
Effluent Limits: 126 cfu/100 mL (AML) and 406 cfu/100 mL (MDL)
Remaining assimilative capacity: 126 cfu/100 mL (AML) and 406 cfu/100 mL (MDL)
10% of remaining assimilative capacity: 12.6 cfu/100 mL (AML) and 40.6 cfu/100 mL (MDL)
Increase in design flow: 0.53 mgd (0.82 cfs) to 2.59 mgd (4.0 cfs)
Receiving water flow: 746 cfs

Current Mixed Concentration: 0.14 cfu/100 mL (AML)
Proposed Mixed Concentration: 0.67 mg/L (AML)

0.67-0.14= 0.53 cfu/100mL (0.42%) reduction in assimilative capacity for the AML

Current Mixed Concentration: 0.45 cfu/100 mL (MDL)
Proposed Mixed Concentration: 2.17 cfu/100 mL (MDL)

2.17-0.45 = 1.7 cfu/100 mL (0.4%) is the loss of assimilative capacity for the MDL

Formula used to calculate mixed concentrations:

Mixed Concentration = Cm = [(Ce * Qe) +(Cu * Qu)] / (Qe+Qu)

Where:
Cm = Mixed Concentration (µg/L)
Ce = Effluent Concentration (µg/L)
Qe = Effluent Volume (liters, calculated as flow rate in cfs * constant 28.316)

Cu = Upstream concentration (µg/L)
Qu = Upstream Volume (liters, calculated as flow rate in cfs * constant 28.316)

Appendix C: Antidegradation Calculations for Pollutants of Concern with New Limits

The proposed permit for the City of Rigby WWTP includes new limits for ammonia (Table C). DEQ compared the water quality resulting from the existing level of ammonia discharged (based upon discharge monitoring report data) and the water quality resulting from the proposed ammonia effluent limits. The limits proposed are calculated using pH and temperature data collected near the WWTP, and represent the 95th percentile of all existing pH and temperature data. This data includes values measured after the 2008 upgrades to the WWTP. Antidegradation calculations are also based on the monitored ammonia values using DEQ's draft Antidegradation Guidance Document (2012).

Table C: Dry Bed Creek Change in Assimilative Capacity for Ammonia

Ammonia Average Monthly Limit				
Parameters	units	Ammonia Average Monthly Limit AML	Current Discharge 95 Percentile since upgrade	% change in Assimilative Capacity[1]
Total ammonia (as N) May 1-September 30	mg/L	4.3	7.21	5%
Total ammonia (as N) October 1- April 30	mg/L	0.65	15.7	-1300%

[1]**Negative values indicate an INCREASE in Assimilative Capacity**

Background concentrations: 7.21 mg/L May-Sep and 15.7 mg/L Oct-Apr
Proposed Effluent Limits: 4.3 mg/L (AML) May-Sep
Proposed Effluent Limits: 0.65 (AML) Oct-Apr
Remaining assimilative capacity: 2.91 mg/L May-Sep and 6.65 mg/L Oct-Apr
0.294 mg/L May-Sep and 0.633 mg/L (AML)
10% of remaining assimilative capacity: 0.291 mg/L (AML) and 0.665mg/L (AML)
Increase in design flow: 0.53 mgd (0.82 cfs) to 2.59 mgd (4.0 cfs)
Receiving water flow: 746 cfs May-Sep, 0.65 cfs Oct-Apr

Current Mixed Concentration: 0.1 mg/L May-Sep and 8.8 mg/L Oct-Apr
Proposed Mixed Concentration: 0.1 mg/L May-Sep and 0.6 mg/L Oct-Apr

0.1-0.1 = 0.0 mg/L (5%) is the reduction in assimilative capacity for the May-Sep AML
0.6-8.8= -8.2 mg/L (-1300%) is the increase in assimilative capacity for Oct-Apr AML

Formula used to calculate mixed concentrations:

Mixed Concentration = Cm = [(Ce * Qe) +(Cu * Qu)] / (Qe+Qu)

Where:

Cm = Mixed Concentration (µg/L)
Ce = Effluent Concentration (µg/L)
Qe = Effluent Volume (liters, calculated as flow rate in cfs * constant 28.316)

Cu = Upstream concentration (µg/L)
Qu = Upstream Volume (liters, calculated as flow rate in cfs * constant 28.316