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:

Jug Mountain Ranch, LLC

Public Comment Start Date: April 4, 2019
Public Comment Expiration Date: May 6, 2019

Technical Contact: John Drabek
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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
Upon the EPA's request, the Idaho Department of Environmental Quality (IDEQ) has provided a draft certification of the 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
Boise Regional Office
1445 N. Orchard
Boise, ID 83706
ph: (208) 373-0550
fx: (208) 373-0287

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."

US EPA Region 10
Suite 900
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
1435 North Orchard Street
Boise, Idaho 83706
(208) 378-5746

Idaho Department of Environmental Quality
Boise Regional Office
1445 N. Orchard
Boise, ID 83706
ph: (208) 373-0550
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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
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
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
BPT	Best Practicable
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
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
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_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Background Information

A. General Information

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

Table 1. General Facility Information

NPDES Permit #:	ID0028029
Applicant:	Jug Mountain Ranch, LLC (Jug Mountain)
Type of Ownership	Private
Physical Address:	13834 Farm to Market Road McCall, Idaho 83638
Mailing Address:	P.O. Box 2332 McCall, Idaho 83638
Facility Contact:	Mr. Craig Collins Facilities Operator (208) 634-6982
Operator Name:	Mr. Craig Collins
Facility Location:	Lakefork, Valley, Idaho
Receiving Water	Cold Creek Tributary of Boulder Creek
Facility Outfall	116.038889 44.758333

B. Permit History

The most recent NPDES permit for the Jug Mountain Ranch (Jug Mountain) was issued on August 24, 2004, became effective on August 24, 2004, and expired on July 31, 2009. An NPDES application for permit issuance was submitted by the permittee on June 3, 2009. The EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively extended and remains fully effective and enforceable.

II. Idaho NPDES Authorization

In 2014, the Idaho Legislature revised the Idaho Code to direct the Idaho Department of Environmental Quality (IDEQ) to seek authorization from the EPA to administer the NPDES permit program for the State of Idaho. On August 31, 2016, IDEQ submitted a program package pursuant to CWA Section 402(b) and 40 CFR 123.21.

IDEQ is seeking authorization for a phased NPDES permit program that would begin July 1, 2018. Assuming that IDEQ's request for authorization is approved, IDEQ would obtain permitting for this facility on July 1, 2019. At that point in time, all documentation required by the permit would be sent to IDEQ rather than to EPA and any decision under the permit stated to be made by EPA or jointly between EPA and IDEQ will be made solely by IDEQ. Permittees will be notified by IDEQ when this transition occurs.

III. Facility Information

A. Treatment Plant Description

Service Area

Jug Mountain is a planned unit development located approximately eight miles south of McCall in Valley County, Idaho. Jug Mountain Ranch LLC owns and operates the Jug Mountain Ranch WWTP (facility) located in McCall, Idaho. The collection system has no combined sewers. The facility serves a resident population of 150 homes with 325 approved residential units (single and multi-family), an 18-hole golf course with clubhouse and maintenance facility, a lodge and 15,000 square feet of restaurants and retail shops. There are no major industries discharging to the facility.

Treatment Process

The design flow of the facility is 0.032 mgd (email Craig Collins Jug Mountain Ranch to John Drabek, EPA, June 19, 2017). The existing permit mistakenly used 0.07 mgd weekly as the design flow rate to calculate mass effluent limitations. This permit lowers the mass effluent limitations for total suspended solid, BOD_5 and total phosphorus based on the corrected design flow rate. The wastewater treatment system consists of a gravity sewer collection system, dual-train sequencing batch reactor (SBR) package treatment plant, coagulant injection system, sand filter, sludge storage, and treatment tanks. The sequential batch reactor discharges intermittently for a duration of six to eight minutes. Disinfection is by ultraviolet radiation. Although the fact sheet for the current permit states both ultraviolent radiation and chlorine were used for disinfection, the treatment system installed after permit issuance does not have an option for chlorine disinfection. (Greg Collins phone call to John Drabek, September 22, 2017 10:45 am).

A schematic of the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A. Because the design flow is less than one mgd, the facility is considered a minor facility.

Outfall Description

The discharge is year round and is intermittent.

The wastewater from the Facility is pumped intermittently several times each day to outfall 001 located approximately ¼ mile from the Facility. The wastewater is routed to outfall 001 via a four inch underground pipeline. According to Facility representatives, the pipeline that routes treated wastewater does not actually route the water directly into Cold Creek. Instead, this pipeline routes treated wastewater to a manhole. From the manhole, the wastewater is

allowed to enter perforated pipes and infiltrates into the ground. According to Facility representatives the perforated pipe drain field is situated such that the closest that a perforated pipe gets to Cold Creek is approximately 100 feet. Once the effluent passes through this gravel drain field it enters a wetland where most of the wastewater infiltrates. According to the Facility representatives the effluent moves from the wetland into Cold Creek above Otter Pond, which then flows into Otter Pond itself (See map Appendix A).

Effluent Characterization

To characterize the effluent, the EPA evaluated the facility's application form, discharge monitoring report (DMR) data, and additional data provided by Jug Mountain. The effluent quality is summarized in Table 2.

Table 2 Effluent Characterization

Parameter	Maximum	Minimum	Notes
pH	8.30	6.70	s.u.
Flow Rate	.0129	0.0017	Mgd
Total Phosphorus	7.840	0.016	mg/L
Ammonia	1.3	0.04	mg/L
Total Nitrogen	6.28	0.82	mg/L

Source: Discharge monitoring reports

Compliance History

A summary of effluent violations is provided in Table 3. The facility entered into a consent agreement and final order (CAFO) with the EPA where the facility agreed to pay a penalty of $6,100 for the alleged effluent limit violations. The CAFO was finalized on September 27, 2012.

The last EPA inspection was in December, 2014. The inspection findings are:

- Confirmed flow monitoring is not conducted in Cold Creek
- Improper calibration of the pH meter 10 percent of the time
- The quality assurance plan did not meet the sample holding time and cooling requirements for preservation required by 40 CFR 136.
- An internal control measurement is to sample batches for TSS prior to discharge with a HACH meter and if found to exceed standards the batch is routed back to the treatment plant. However, sometimes the HACH measurement is reported on the DMRs showing a violation. The DMRs may report sample results for wastewater discharges that were ultimately not discharged causing an erroneously reported violations.

Brett Morrison of IDEQ inspected the facility on December, 2017.

Table 3. Summary of Effluent Violations

Parameter	Limit	Units	Number of Instances
Nitrogen, ammonia total [as N]	Daily Maximum	mg/L	2
Nitrogen, ammonia total [as N]	Daily Maximum	lb/day	1
Solids, total suspended	Monthly Average	mg/L	8
Nitrogen, ammonia total [as N]	Monthly Average	lb/day	1
Nitrogen, ammonia total [as N]	Monthly Average	mg/L	1
Phosphorus, total [as P]	Monthly Average	mg/L	4
BOD, 5-day, 20 deg. C	Weekly Average	mg/L	1
Solids, total suspended	Weekly Average	mg/L	9

IV. Receiving Water

In drafting permit conditions, the EPA must analyze the effect of the facility's discharge on the receiving water. The details of that analysis are provided later in this Fact Sheet. This section summarizes characteristics of the receiving water that impact that analysis.

A. Receiving Water

This facility discharges to Cold Creek which is a tributary of Boulder Creek. Boulder Creek flows into the Cascade Reservoir located in Valley County near McCall, Idaho.

B. Designated Beneficial Uses

This facility discharges to Cold Creek Tributary, which is a tributary to Boulder Creek. Boulder Creek flows to the Cascade Reservoir in the North Fork Payette Subbasin (HUC 17050123), (IDAPA 58.01.02.140.17), Water Body Unit SW-11-02.

Cold Creek and Boulder Creek do not have specific use designations in the Idaho Water Quality Standards (IDAPA 58.01.02.110 through 160). The Water Quality Standards state that such "undesignated waterways" are to be protected for the uses of cold water aquatic life and primary contact recreation (IDAPA 58.01.02.101.01).

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).

C. Water Quality

The water quality for the receiving water is summarized in Table 4.

Table 4. Receiving Water Quality Data

Parameter	Units	Percentile	Value	Source
Temperature	°C	95th	16.9	permittee
pH	Standard units	95th	7.6	permittee
Ammonia	mg/L	maximum	0.47	permittee
Total Nitrogen	mg/L	maximum	0.71	permittee
Source: Data collected by permittee 1/29/2014-11/2/2016				

D. Water Quality Limited Waters

The State of Idaho's 2014 Integrated Report Section 5 (section 303(d)) lists Cold Creek tributary to Boulder Creek**,** as impaired for phosphorus.

On May 13, 1996, the EPA approved IDEQ's Cascade Reservoir –Part I TMDL, Subbasin Assessment, Total Maximum Daily Load (hereinafter referred to as the 1996 TMDL). The TMDL did not include a wasteload allocation (WLA) for the Jug Mountain facility because it began discharging in 2004, after the TMDL was established.

On April 19, 1999 the EPA approved IDEQ's Cascade Reservoir Watershed, Phase II Water Quality Management Plan and TMDL Five-Year Review, December, 1998. (hereinafter referred to as the 1998 TMDL). Again, the TMDL did not include a WLA for Jug Mountain because the facility had not yet been constructed.

After the facility began discharging, in 2009, IDEQ developed the *Cascade Reservoir Watershed Phase III Water Quality Management Plan and TMDL Five Year Review*, February 2009, (hereinafter referred to as the 2009 Five Year Review). The 2009 Five Year Review stated:

> "If a new source wishes to discharge phosphorus load to the reservoir or watershed, the discharge will have to be offset by additional reductions in excess of the required 30% elsewhere in the watershed. New sources will be required to meet the loading reductions for the land on which they intend to locate, in addition to meeting a requirement for no-net-increase in loading as described above."

Since Jug Mountain was a new discharge, the facility took measures to offset the discharge through additional reductions as discussed in more detail in Part V.D .

Low Flow Conditions

Critical low flows for the receiving water are based on the previous permit and information from Jug Mountain. No flow monitoring was submitted by the permittee. According to Jug Mountain, monitoring of flow in Cold Creek was inhibited by periods of impenetrable ice and very low flow. The previous permit used 6 cfs as the critical flow using calculations based on interpolations from data collected from three locations on Boulder Creek (one upstream and two downstream of the Cold Creek drainage). Known flow volumes and patterns were identified for Boulder Creek and then normalized to be representative of the relative area of the Cold Creek.

Based on observations by Jug Mountain, Cold Creek has no flow in the winter, fall and summer. Craig Collins, Facilities Operator, confirmed a low flow of 6 cfs for Cold Creek

during the spring quarter. Therefore, for the reasonable potential analysis and for establishing effluent limitations 6 cfs will be used for a spring quarter mixing zone calculation and zero flow will be used for the winter, fall and summer quarters.

V. Effluent Limitations and Monitoring

Table below presents the existing effluent limits and monitoring requirements in the Jug Mountain Permit. Table 6, below, presents the proposed effluent limits and monitoring requirements in the draft permit.

Table 5. Existing Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits							
Flow, mgd	Flow	0.05	0.07	0.12	Influent and Effluent	continuous	Recorder
Biochemical Oxygen Demand (BOD_5)	mg/L	5	7.5	--	Influent and Effluent	1/week	Composite[1]
	lbs/day	3	4.4	--			
BOD_5 Percent Removal	%	90 (minimum)	--	--	--	1/month	Calculation
Total Suspended Solids (TSS)	mg/L	5	7.5	--	Influent and Effluent	1/week	Composite[1]
	lbs/day	3	4.4	-- --			
TSS Percent Removal	%	90 (minimum)	--	--	--	1/month	Calculation
E. Coli Bacteria	#/100 ml	126	--	406	Effluent	1/week	Grab
Total Phosphorus	mg/L	3	--	--	Effluent	1/week	Composite[1]
	lbs/day	1.8	--	--	Effluent	1/week	Calculation[2]
Total Residual Chlorine[8]	mg/L	0.14	0.28	--	Effluent	daily	Grab
	lbs/day	0.08	0.16	--	Effluent	daily	Calculation[1]
pH	std units	Between 6.5 – 9.0			Effluent	5/week	Grab
Total Nitrogen (Total Kjeldahl Nitrogen + Nitrate-Nitrogen)	mg/L	10	--	--	Effluent	1/month	Composite[1]
	lbs/day	5.8	--	--	Effluent	1/month	Calculation[1]
Narrative	There shall be no discharge of floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.				none	none	none
Report Parameters							
Total Ammonia (as N)	mg/L	Report	--	--	Effluent	1/month	Composite [1]

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Orth-Phosphorus	mg/L	Report	--	--	Effluent	1/month	Calculation[2]

1. Composite samples shall consist of a minimum of 4 equal aliquots taken during 4 consecutive SBR discharge cycles. Sample analysis shall be done by approved methods as outlined in 40 CFR, Part 136. Other sampling and analysis methods may be used with EPA's prior approval.
2. Loadings are calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34.

Table 6. Draft Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits							
Biochemical Oxygen Demand (BOD_5)	mg/L	5	7.5	--	Influent and Effluent	1/week	Composite[1]
	lbs/day	1.33	2.00	--			
BOD_5 Percent Removal	%	90 (minimum)	--	--	--	1/month	Calculation
Total Suspended Solids (TSS)`	mg/L	7.7	15.8	--		1/week	Composite[1]
	lbs/day	2.05	4.22	--			
TSS Percent Removal	%	90 (minimum)	--	--	--	1/month	Calculation
E. Coli Bacteria	#/100 ml	126	--	406	Effluent	1/week	Grab
Total Phosphorus	mg/L	3	--	--	Effluent	1/week	Composite[1]
	lbs/day	0.801	--	--	Effluent	1/week	Calculation[2]
Total Ammonia (as N) July 1 – March 31	mg/L	3.1	9.6	--	Effluent	1/week	Grab
	lbs/day	0.81	2.57	--	Effluent	1/week	Calculation[2]
pH	std units	Between 6.5 – 9.0			Effluent	5/week	Calculation[2]
Nitrite (as N) July 1 -March 31	mg/L	3.86	10	--	Effluent	1/week	Composite[1]
	lbs/day	1.03	2.67	--	Effluent	1/week	Calculation[2]
Total Nitrogen (Total Kjeldahl Nitrogen + Nitrate-Nitrogen)	mg/L	10	--	--	Effluent	1/month	Composite[1]
	lbs/day	2.67	--	--	Effluent	1/month	Calculation[2]

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Narrative	There shall be no discharge of floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.				none	none	none

1. Composite samples shall consist of a minimum of 4 equal aliquots taken during 4 consecutive SBR discharge cycles. Sample analysis shall be done by approved methods as outlined in 40 CFR, Part 136. Other sampling and analysis methods may be used with EPA's prior approval.
2. Loadings are calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34.

Effluent Limit Changes from the Previous Permit

- The average monthly TSS concentration limit is increased from 5 mg/L to 7.7 mg/L and from an average weekly limit of 7.5 mg/L to 15.8 mg/L.
- A total ammonia monthly limit of 3.1 mg/L and an average weekly limit of 9.6 are added to the permit for the months July 1 through March 31. Ammonia monthly loading limits of 0.81 lbs/day and an average weekly 2.57 weekly limits are also added for these months.
- Nitrite limits of 3.86 mg/L monthly and 10 mg/L weekly are added for the months July 1 through March 31. Loading limits of 1.03 lbs/day monthly and 2.67 lbs/day weekly are also added for these months.
- Total residual chlorine limits have been taken out of the permit.
- TSS mass limits are reduced from 3 lbs/day monthly to 2.04 lbs/day and from 4.4 lbs/day weekly to 4.22 lbs/day.
- BOD_5 mass limits are reduced from 3 lbs/day monthly to 1.33 lbs/day and from 4.4 lbs/day weekly to 4.22 lbs/day.
- Total phosphorus mass limits are reduced from 1.8 lbs/day monthly to 0.801 lbs/day.
- Total nitrogen mass limit is reduced from 5.8 lbs/day to 2.67 lbs/day.

A. Basis for Effluent Limits

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.

B. Pollutants of Concern

Pollutants of concern are those that either have technology-based limits or may need water quality-based limits. The EPA identifies pollutants of concern for the discharge based on those which:

- Have a technology-based limit
- Have an assigned wasteload allocation (WLA) from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring. Monitoring data are reported in the application and DMR and any special studies
- Are expected to be in the discharge based on the nature of the discharge

The wastewater treatment process for this facility includes both primary and secondary treatment, as well as disinfection with chlorination. Pollutants expected in the discharge from a facility with this type of treatment, include but are not limited to: five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), *E. coli* bacteria, pH, ammonia, and phosphorus.

Based on this analysis, pollutants of concern are as follows:

- BOD_5
- TSS
- *E. coli* bacteria
- pH
- Ammonia
- Total Phosphorus
- Total Nitrogen (Total Kjeldahl Nitrogen + Nitrate-Nitrogen)
- Nitrite

C. Technology-Based Effluent Limits

Jug Mountain is a privately owned treatment facility, not a POTW. Where effluent guidelines have not been promulgated by EPA, the CWA and NPDES regulations at 40 CFR § 125.3 require the permit writer to establish technology based effluent limits on a case-by-case basis based on Best Professional Judgment (BPJ). In the case of Jug Mountain the permit writer for the existing permit applied performance based limits based on the specifications provided by the manufacturer of the package plant as stated on page A-3 of the Fact Sheet:

> "The draft permit proposes technology-based limits that are more restrictive than secondary treatment requirements. The SBR manufacturer's data and the historic performance of similar systems in the state suggest that the system is capable of meeting the more restrictive limits."

These technology based limits are for BOD_5, TSS, and removal of BOD_5, and TSS as shown in Table 5 *Existing Permit - Effluent Limits and Monitoring Requirements.*

Based on monitoring data submitted from 2012 to April, 2017 Jug Mountain has attained the concentration limits in the existing permit except for TSS monthly and weekly concentration

limits. Jug Mountain has also attained the 90 percent removal requirements. This is reflected in Table 3.

The calculated performance based limits for TSS using procedures in the TSD result in an average weekly TSS effluent limit of 15.8 mg/L and an average monthly limit of 7.7 mg/L. (See Appendix D and the backsliding analysis for derivation of these limits).

Mass-Based Limits

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

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

Since the design flow for this facility is 0.032 mgd, the technology based mass limits for BOD_5 and TSS are calculated as follows:

BOD_5

Average Monthly Limit = 5 mg/L × 0.032 mgd × 8.34 = 1.33 lbs/day

Average Weekly Limit = 7.5 mg/L × 0.032 mgd × 8.34 = 2.00 lbs/day

TSS

Average Monthly Limit = 7.7 mg/L × 0.032 mgd × 8.34 = 2.05 lbs/day

Average Weekly Limit = 15.8 mg/L × 0.032 mgd × 8.34 = 4.22 lbs/day

D. 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. 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. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

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

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 for the discharge in an approved TMDL. If there are no approved TMDLs that specify wasteload allocations for this discharge; all of the water quality-based effluent limits are calculated directly from the applicable water quality standards.

Reasonable Potential Analysis and Need for Water Quality-Based Effluent Limits

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (*TSD*) 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.

In some cases, a dilution allowance or mixing zone is permitted. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and within which certain water quality criteria to be exceeded (EPA, 2014). While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired, all designated uses are maintained and acutely toxic conditions are prevented.

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 mixing zones during the Spring quarter (April 1st through June 30th). The proposed mixing zones and dilution factors are summarized in Table 8. All dilution factors are calculated with the effluent flow rate set equal to the design flow of .032 mgd.

Table 8. Mixing zones Ammonia Spring Quarter (April 1 – June 30)

Criteria Type	Critical Low Flow (cfs)	Mixing Zone (% of Critical Low Flow)	Dilution Factor	
Acute Aquatic Life	6	2		3.4
Chronic Aquatic Life	6	2		3.4

The reasonable potential analysis and water quality-based effluent limit calculations were based on mixing zones shown in Table 8. If IDEQ revises the allowable mixing zone in its final certification of this permit, reasonable potential analysis and water quality-based effluent limit calculations will be revised accordingly.

The equations used to conduct the reasonable potential analysis and calculate the water quality-based effluent limits are provided in Appendix B and C.

Reasonable Potential and Water Quality-Based Effluent Limits

The reasonable potential and water quality-based effluent limit for specific parameters are summarized below. The calculations are provided in Appendix C.

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 increase in pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. Table 9 below details the equations used to determine water quality criteria for ammonia.

Table 9 Ammonia Criteria

Total ammonia nitrogen criteria (mg N/L):
Annual Basis
Based on IDAPA 58.01.02

INPUT	
1. Receiving Water Temperature (deg C):	16.9
2. Receiving Water pH:	7.60
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**11.37**
Chronic Criterion (CCC)	**3.41**

Acute Criteria Equation: Cold Water

$$CMC = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

Acute Criteria Equation: Warm Water

$$CMC = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

Chronic Criteria: Cold Water, Early Life Stages Present

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

Chronic Criteria: Cold Water, Early Life Stages Absent

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \bullet 1.45 \cdot 10^{0.028(25-T)})$$

Summer, Fall, Winter Quarters

A reasonable potential calculation showed that the Jug Mountain discharge would have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia in the summer, fall and winter quarters. Therefore, the draft permit contains a water quality-based effluent limit for ammonia from July 1 to March 31. See Appendices B and C for reasonable potential and effluent limit calculations for ammonia.

Spring Quarter

To assess the uncertainty in the flow estimate to affect the reasonable potential calculation the EPA looked at the minimum flow necessary to result in no reasonable potential for Jug Mountain to violate the water quality standards in Cold Creek. The minimum flow for no reasonable potential for Jug Mountain to violate the water quality standards for ammonia is 0.3 cfs. This is less than one tenth of the flow calculated for Cold Creek and provides assurance that during the spring quarter, despite the uncertainty of the flow calculation, Jug Mountain will not violate the water quality standards 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 compared to the water quality criteria. Jug Mountain has achieved this level of control. The water quality standards are

more stringent than the secondary standard. Therefore the water quality standards for Cold Creek are selected as the effluent limitations.

Phosphorus

The receiving water, Cold Creek tributary to Boulder Creek is impaired for phosphorus. The 1996 TMDL and 1998 TMDL did not include a WLA for the Jug Mountain facility because the facility began discharging in 2004, after the TMDL was established. In the previous 401 certification of the previous permit, IDEQ required the facility to achieve the total phosphorus water quality goals in the TMDL. In addition, IDEQ's 2009 Five Year Review stated:

> "If a new source wishes to discharge phosphorus load to the reservoir or watershed, the discharge will have to be offset by additional reductions in excess of the required 30% elsewhere in the watershed. New sources will be required to meet the loading reductions for the land on which they intend to locate, in addition to meeting a requirement for no-net-increase in loading as described above."

As a result, in order to achieve no-net-increase, the previous permit established total phosphorus limits based upon the water quality goals in the TMDL and required loading reduction for land on which the facility intended to locate. Jug Mountain reduced discharges to offset the increase from the sewage treatment plant as calculated in the existing permit fact sheet. Improvements implemented by the permittee included changes in grazing management, forest land management and streambank/habitat improvements along the riparian corridor.

An updated analysis of the current offsets was provided by Jug Mountain on February 22, 2019 shown below.

Table 2
Jug Mountain Ranch
Revised 2/12/2019

Total Phosphorus (TP) Reductions Estimated for the Jug Mountain Ranch Project PUD at Build-Out

Reduction in Grazing				
	Acres	TP Delivery Coeefficient	Animal Unit Month Density Factor (AMU)	Total Phosphorus (kg/year)
Tier 1	130	0.3484	1.2	54
Tier 2	310	0.2300	1.2	86
Tier 3	230	0.0303	1.2	8
Total	670			148
Forested Land Improvements				
	Acres	TP Delivery Coeefficient		Total Phosphorus (kg/year)
Total	670	0.0480		32
Streambank Stabilization (Boulder Creek)				
	Linear Feet	Sediment (cy/in.ft)	Sediment (tons/year)	Total Phosphorus (kg/year)
Highly Degraded	2600	0.8000	1572	249
Moderately Degraded	5000	0.3500	1367	217
Total	7600		2939	466
Streambank Stabilization (Cold Cr. & Whilhelm Cr.)				
Moderately Degraded	6540	0.0400	204	32
Total	6540		204	32
Golf Course and Subdivsion (18 holes & 325 lots)				
	Acres	TP Delivery Coeefficient	Fertilization Rate kg/acre	Total Phosphorus (kg/year)
Golf Course	131	0.0100	6.9	-9
Subdivision*	81	0.0200	13.8	-22
Total				-31
Total Estimated Reduction Realized				647 kg/year
Total Reduction Req'd by the TMDL (30% of Grazing and Forest Land Imp				54 kg/year

*Golf Course application rate is 14# soluble phosphorus/acre applied once per year.
*Subdivion assumes 0.25 acres of irrigation/lot (325 lots total at build out).

With the 30 percent forestry and grazing reductions required by the TMDL the estimated reduction realized available to offset the discharge is 593 kg/year.

647 – 54 = 593 kg/yr

Future upgrades to the Jug Mountain Treatment Plant may include an increase in design capacity to 0.05 mgd. Using this theoretical flow rate the potential discharge is

0.050 mgd x 8.34 x 3 mg/L = 1.25 lbs/day (0.567 kg/day) or 208 kg/year

With a margin of safety ratio of 1.5 (208 x 1.5= 312 kg/year) 312 kg/year is needed for the offset. They have 593 kg/yr, which is 281 kg/year more than required.

Therefore the total phosphorus concentration limits are unchanged in the proposed permit. However the mass limits are recalculated using the correct design flow of 0.032 mgd:

Average Monthly Limit = 3 mg/L × 0.032 mgd × 8.34 = 0.801 lbs/day

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. A mixing zone is not appropriate for bacteria for waters designated for contact recreation. 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.

Nitrate-Nitrite and Nitrite as Nitrogen

Idaho water quality standards (IDAPA 58.01.02.250.02) specify the use of "Water Quality criteria 1972 (Blue Book), Section V, Agricultural Uses of Water, EPA, March, 1973 will be used for determining criteria" to protect waters designated as agricultural water supplies. The

numeric criteria of 100 mg/L nitrate-nitrite as N is listed for agricultural water supplies intended as drinking water for livestock.

The numeric criteria of 10 mg/L nitrite as N is listed for agricultural water supplies intended as drinking water for livestock.

Spring Quarter

For the spring quarter a reasonable potential analysis found no reasonable potential to violate the water quality standard for nitrite at 10 mg/L or nitrate-nitrite at 100 mg/L using the discharge monitoring data submitted for total nitrogen. The minimum mixing zone for no reasonable potential is 0.004 percent (see Appendix C).

Nitrate-nitrite and nitrite were not monitored separately. Rather total nitrogen was monitored. Since total nitrogen is composed of total kjeldahl nitrogen and nitrate-nitrogen using total nitrogen provides a conservative calculation of reasonable potential for both nitrate-nitrite and nitrite. The concentration at the edge of the mixing zone is 9.56 mg/L that is less than the water quality standard for both nitrate-nitrite and nitrite.

Summer, Fall and Winter Quarters

For the summer, fall and winter quarters Jug Mountain has a reasonable potential to violate the 10 mg/L water quality standard for nitrite. Jug Mountain does not have a reasonable potential to violate the water quality standard for nitrate-nitrite. Effluent limitations are established for nitrite as nitrogen of 3.86 mg/L average monthly limit and 10.0 mg/L average weekly limit. Mass limits are 1.03 lbs/day average monthly limit and 2.86 lbs/day average weekly limit (See Appendix C).

Total Nitrogen

The existing permit established total nitrogen technology based effluent limitations of 10 mg/L and 5.8 lbs/day to control nitrogen discharges. However, using the correct design flow the mass based effluent limitation is established at 2.67 lbs/day.

10 mg/L x 0.032 mgd x 8.34 = 2.67 lbs/day

The treatment system has achieved these levels of control and are established as technology based effluent limitations.

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.

E. Antibacksliding

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. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual *Final Effluent Limitations and Anti-backsliding*.

An anti-backsliding analysis was done for the TSS concentration limits in the existing permit.

The draft permit established technology-based limits that are more restrictive than secondary treatment requirements. The SBR manufacturer's data and the historic performance of similar systems in the state suggested to the permit writer that the system would have been capable of meeting the more restrictive limits. However this proved not to be the case and Jug Mountain has not been able to consistently achieve these limits.

As exemption allowed under 402(o)(2) allows:

> "The permittee has installed and properly operated and maintained required treatment facilities but still has been unable to meet the effluent limitations (relaxation may be allowed only to the treatment levels actually achieved)."

As Table 3 shows Jug Mountain has not been able to achieve the TSS concentration limits by properly operating and maintaining the installed treatment facilities. The "treatment levels actually achieved" are found by using effluent monitoring data from June, 2012 to April, 2017 and procedures in the Technical Support Document for Water Quality-based Toxics Control (TSD) the levels achieved considering the variance of the discharge. This calculated levels actually achieved are a weekly average of 15.8 mg/L and a monthly average of 7.7 mg/L (See Appendix D).

VI. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

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

The 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.

Monitoring Changes from the Previous Permit

- Monitoring for chlorine has been taken out of the permit as chlorine disinfection is not used at Jug Mountain.
- The Cascade Reservoir Phase I Watershed Management Plan designates phosphorus as the primary nutrient pollutant of concern. Total phosphorus is generally the limiting pollutant used to control of nutrients. Therefore orthophosphorus monitoring is discontinued.
- Ammonia monitoring is increased from once per month to once per week.

- Once per week nitrite monitoring is added.

C. Surface Water Monitoring

In general, surface water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, surface water monitoring may be required for pollutants for which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body. Table 10**Error! Reference source not found.** presents the proposed surface water monitoring requirements for the draft permit. Surface water monitoring results must be submitted with the DMR.

Table 10 Surface Water Monitoring

Parameter	Units	Frequency	Sample Type
E. Coli Bacteria	colonies/100 ml	Monthly	Grab
Total Phosphorus	mg/L	Monthly	Grab
Ortho-phosphorus	mg/L	Monthly	Grab
Total Ammonia as N	mg/L	Monthly	Grab
Total Nitrogen (Total Kjeldahl Nitrogen + Nitrate-Nitrogen)	mg/L	Monthly	Grab
Temperature	°C	Monthly	Grab
pH	standard units	Monthly	Grab

Surface water monitoring is unchanged from the existing permit except for flow monitoring. According to Jug Mountain, monitoring of flow in Cold Creek was inhibited by periods of impenetrable ice and very low flow.

The purpose of surface water monitoring is to aide in control of nutrients in Cold Creek that is not meeting water quality standards for nutrients and to determine the water quality standard for ammonia.

D. Electronic Submission of Discharge Monitoring Reports

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

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

VII. 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.

VIII. Other Permit Conditions

A. Quality Assurance Plan

The Jug Mountain is required to update the Quality Assurance Plan within 180 day 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 permittee to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 180 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

SSOs are not authorized under this permit. 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

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. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. 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 Jug Mountain Ranch 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 WWTP 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.

For more information, please visit http://www.epa.gov/compliance/ej/plan-ej/ and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*,

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 flow or loading exceeds 85% of the design criteria values for three consecutive months.

F. 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.

IX. 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.

The National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) website did not list any anadromous fish species that are either proposed, listed or candidates for listing under the ESA known to occur in Boulder Creek in the vicinity of the proposed project.

A review of the threatened and endangered species located in Idaho under the jurisdiction of the USFWS finds that bull trout are listed as threatened in the area of the discharge.

Activities identified by USFWS as potential threats to this species are not related to the operations or management of the wastewater treatment facility. Cited are habitat degradation and fragmentation, over-harvest and poaching, decreases in range include dams, siltation from logging and farming and blockage of migratory corridors. Therefore, the wastewater treatment facility and related development are not expected to negatively affect bull trout populations and the discharge will have no effect on bull trout.

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). A review of the Essential Fish Habitat documents shows that essential fish habitat are not in the vicinity of the discharge area.

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

The EPA has determined that issuance of this permit will have no effect on EFH in the vicinity of the discharge.

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. A copy of the draft 401certification is provided in Appendix E.

D. Antidegradation

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

E. Permit Expiration

The permit will expire five years from the effective date.

X. References

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

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

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EPA, 2007. *EPA Model Pretreatment Ordinance*, Office of Wastewater Management/Permits Division, January 2007.

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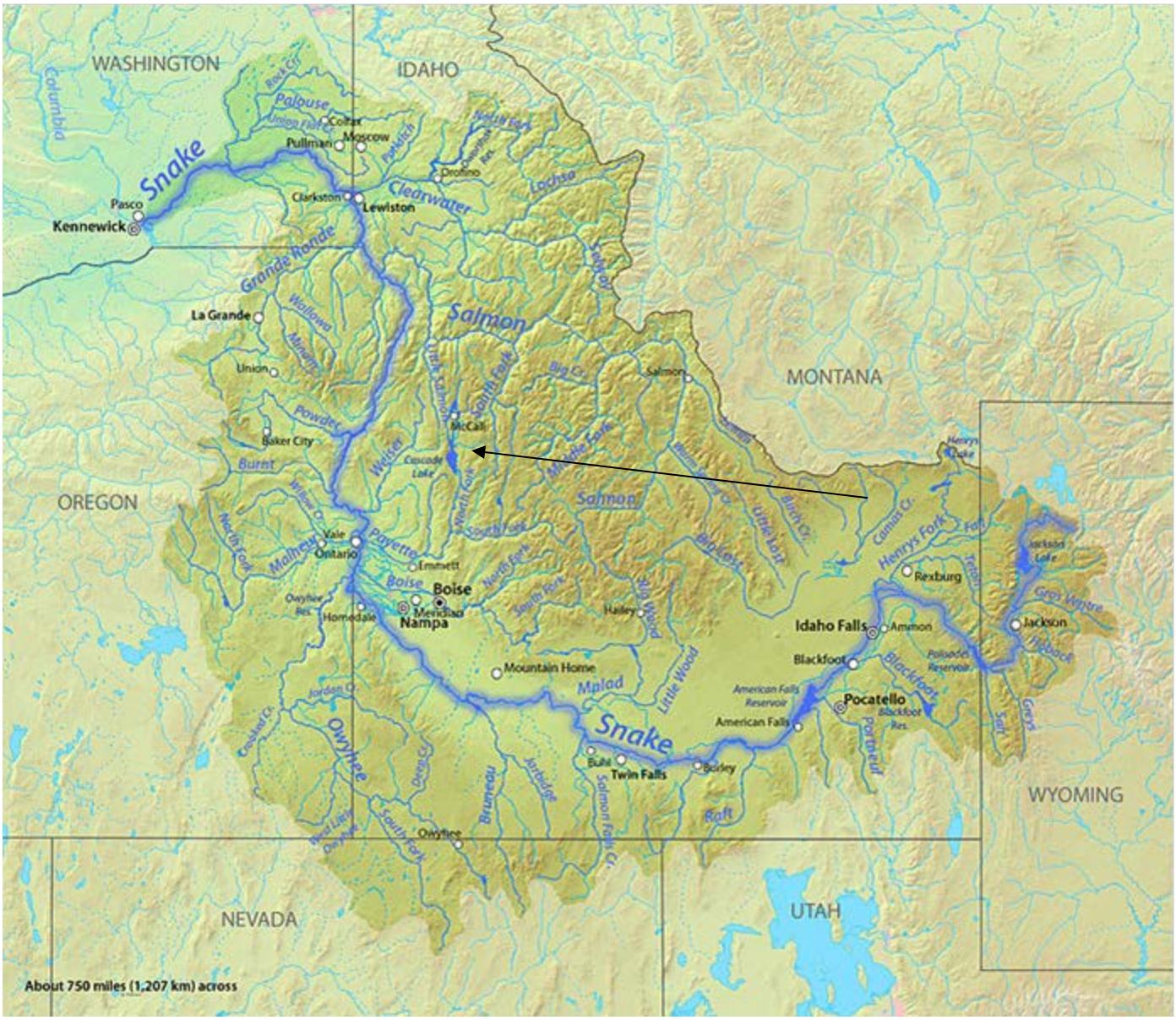
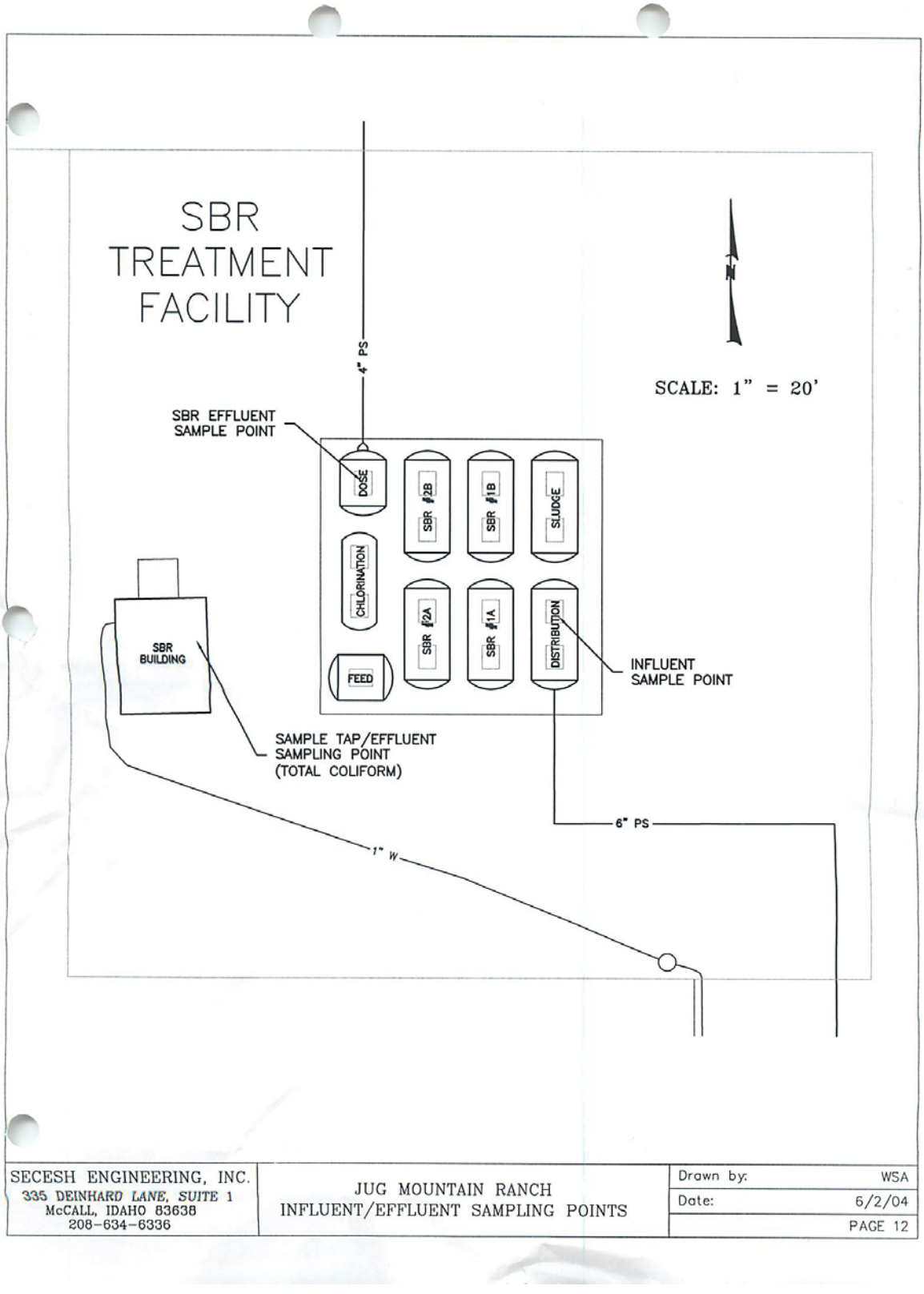
Cascade Reservoir –Phase I Watershed Management Plan, Idaho Division of Environmental Quality, Southwest Idaho Regional Office, Subbasin Assessment, Total Maximum Daily Load, Idaho Department of Environmental Quality, January, 1996

Cascade Reservoir, Phase II, Watershed Management Plan, Division of Environmental Quality, Boise Regional office, December, 1998

Cascade Reservoir Watershed Phase III Water Quality Management Plan and TMDL Five Year Review, Idaho Department of Environmental Quality, February 2009

Appendix A. Facility Information

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CHLORINATION
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DISTRIBUTION
FEED
SBR BUILDING
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335 DEINHARD LANE, SUITE 1
McCALL, IDAHO 83638
208-634-6336
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INFLUENT/EFFLUENT SAMPLING POINTS
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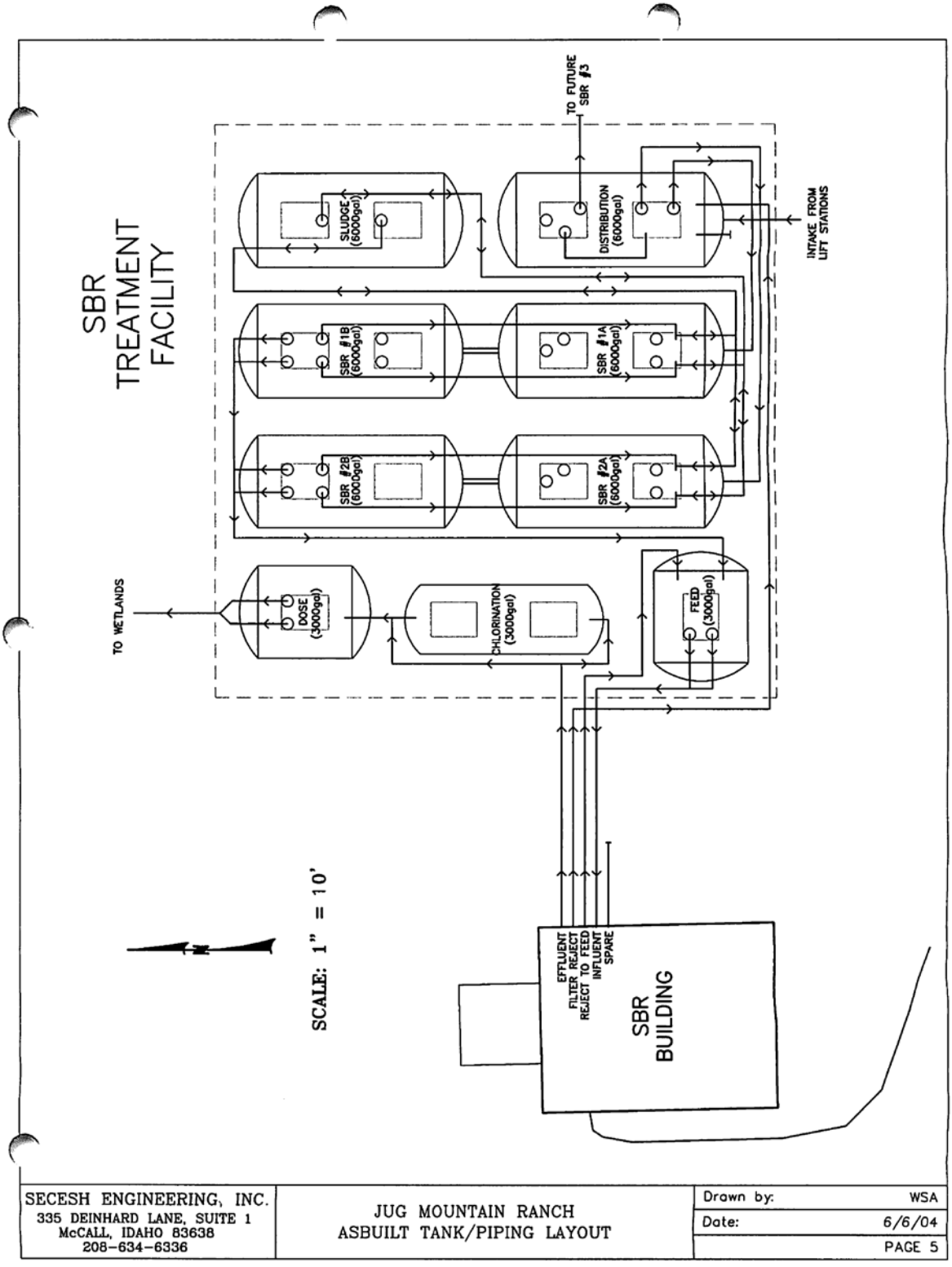
Date: 6/2/04
PAGE 12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SBR #2B (6000gal)
SBR #2A (6000gal)
TO WETLANDS
DOSE (3000gal)
CHLORINATION (3000gal)
FEED (3000gal)
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FILTER REJECT
REJECT TO FEED
INFLUENT
SPARE
SBR BUILDING
SECESH ENGINEERING, INC.
335 DEINHARD LANE, SUITE 1
McCALL, IDAHO 83638
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JUG MOUNTAIN RANCH
ASBUILT TANK/PIPING LAYOUT
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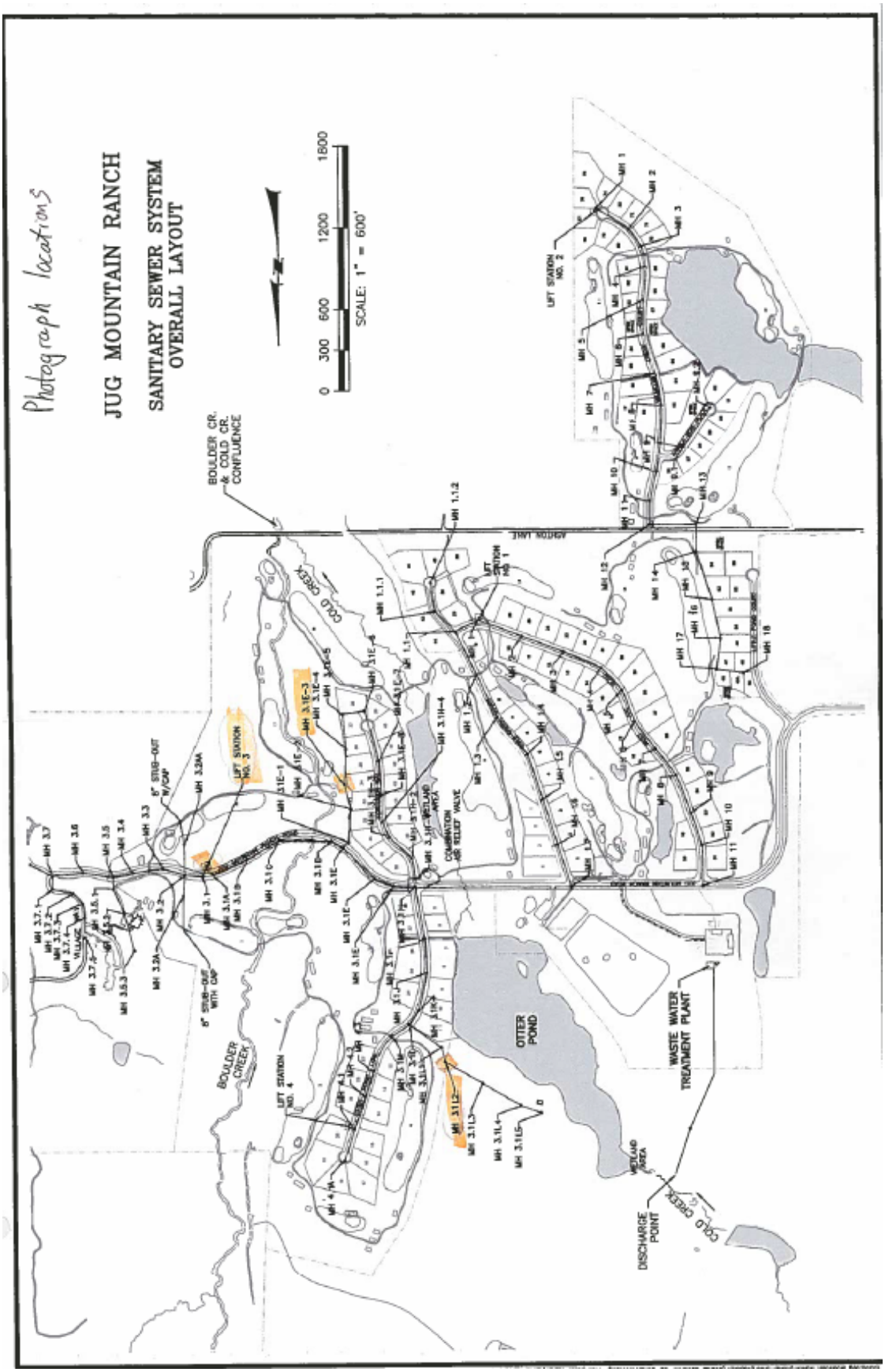
PAGE 5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OVERALL LAYOUT
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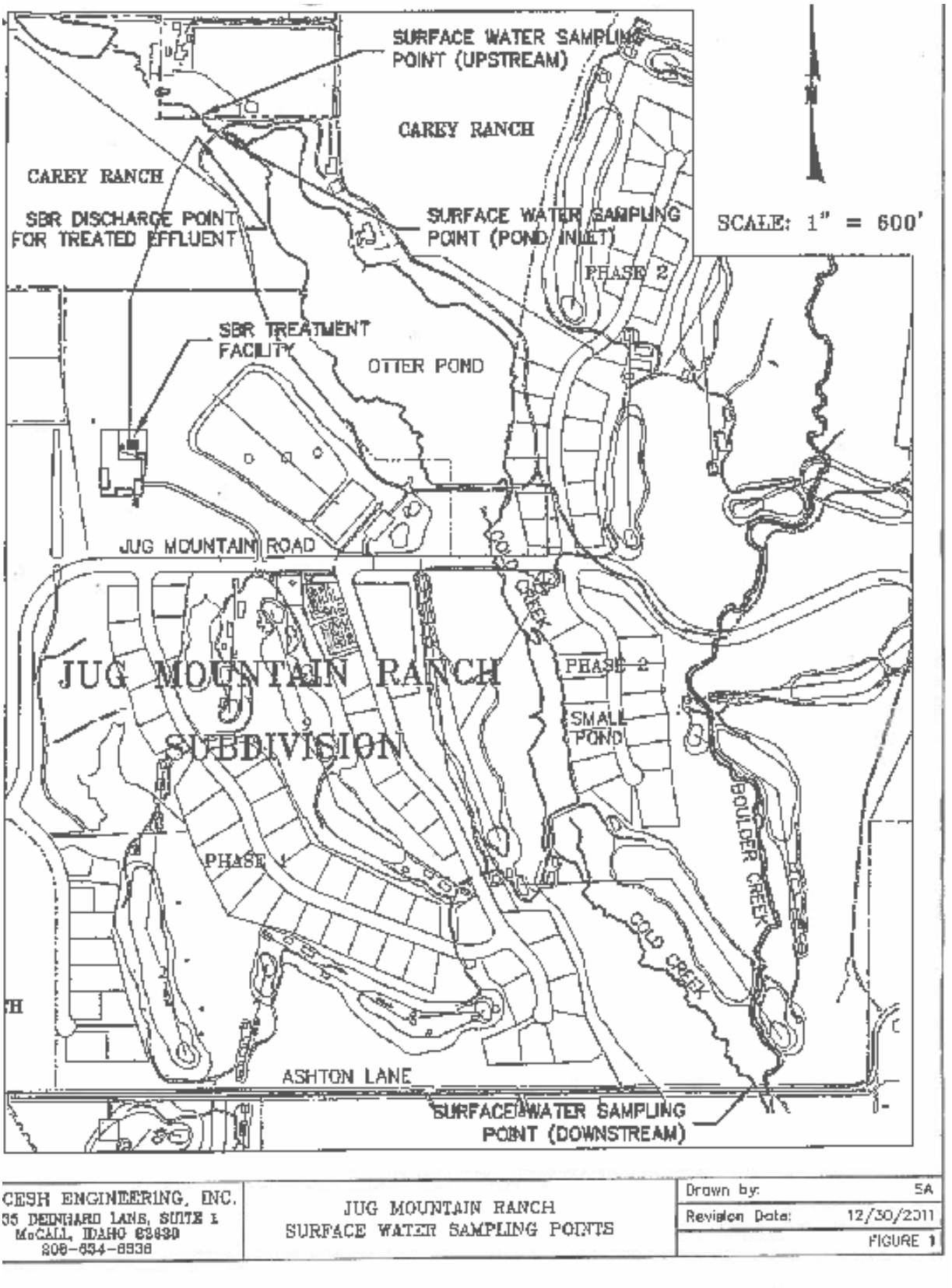
BOULDER CR. & COLD CR. CONFLUENCE
COLD CREEK
BOULDER CREEK
LIFT STATION NO. 1
LIFT STATION NO. 2
LIFT STATION NO. 3
LIFT STATION NO. 4
6" STUB-OUT W/CAP
6" STUB-OUT WITH CAP
COMBINATION AIR RELEASE VALVE
OTTER POND
WASTE WATER TREATMENT PLANT
WETLAND AREA
DISCHARGE POINT
COLD CREEK


SURFACE WATER SAMPLING POINT (UPSTREAM)
CAREY RANCH
CAREY RANCH
SBR DISCHARGE POINT FOR TREATED EFFLUENT
SURFACE WATER SAMPLING POINT (POND INLET)
SCALE: 1" = 600'
PHASE 2
SBR TREATMENT FACILITY
OTTER POND
JUG MOUNTAIN ROAD
COLD CREEK
JUG MOUNTAIN RANCH SUBDIVISION
PHASE 2
SMALL POND
BOULDER CREEK
PHASE 1
COLD CREEK
ASHTON LANE
SURFACE WATER SAMPLING POINT (DOWNSTREAM)
CESH ENGINEERING, INC.
35 DEINHARD LANE, SUITE 1
McCALL, IDAHO 83638
208-634-8936
JUG MOUNTAIN RANCH
SURFACE WATER SAMPLING POINTS
Drawn by: SA
Revision Date: 12/30/2011
FIGURE 1

Appendix B. Reasonable Potential and Water Quality-Based Effluent Limit Formulae

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.

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, page C-5). 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

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

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:

$$C_e = (RPM)(MRC) \qquad \text{Equation 10}$$

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.

B. WQBEL Calculations

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. 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 __. As discussed in Appendix ___, 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,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

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

Derive the maximum daily and average monthly effluent limits

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

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

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

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

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

C. Critical Low Flow Conditions

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

Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	harmonic mean flow
Ammonia	30B3 or 30Q10
1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years. 2. The 1B3 is biologically based and indicates an allowable exceedence of once every 3 years. 3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years. 4. The 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years. 5. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years. 6. The 30Q10 represents the lowest average 30 consecutive day flow with an average recurrence	

frequency of once in 10 years.
7. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.

Appendix C. Reasonable Potential and Water Quality-Based Effluent Limit Calculations

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

Facility Name	Jugg Mountain
Facility Flow (mgd)	0.0320
Facility Flow (cfs)	0.0495

Critical River Flows	(IDAPA 58.01.02 03. b)	Crit. Flows Spring Spring	**Crit. Flows** Summer, Fall, Winter	Crit. Flows Summer, Fall, Winter
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	6.0	0.0	0.0
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	6.0	0.0	0.0
Ammonia	**30B3/30Q10** (seasonal)		--	0.0
Human Health - Non-Carcinogen	**30Q5**	--	--	--
Human Health - carcinogen	**Harmonic Mean Flow**	--	--	--

Receiving Water Data

Hardness, as mg/L $CaCO_3$ *** Enter Hardness on WQ Criteria tab ***

Temperature, °C Temperature, °C

pH, S.U. pH, S.U.

Notes:
5th % at critical flows
95th percentile
95th percentile

Pollutants of Concern			Nitrite, Spring	Nitrite, Summer, Fall, Winter	Nitrate-Nitrite Summer, Fall Winter
Effluent Data	**Number of Samples in Data Set (n)**		57	57	57
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		1.07	1.07	1.07
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		6,280.00	6,280.00	6,280.00
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only				
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**		710	710	710
	Geometric Mean, µg/L, Human Health Criteria Only				
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	10,000.	10,000.	100,000.
	Aquatic Life Criteria, µg/L	Chronic	10,000.	10,000.	100,000.
	Human Health Water and Organism, µg/L			#N/A	#N/A
	Human Health, Organism Only, µg/L			#N/A	#N/A
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute			
		Chronic			
	Carcinogen (Y/N), Human Health Criteria Only		--	--	--
Percent River Flow Default Value = **0.004**	**Aquatic Life - Acute**	**1Q10**	0.00400	0%	0%
	Aquatic Life - Chronic	7Q10 or 4B3	0.00400	0%	0%
	Ammonia	30B3 or 30Q10	0.00400	0%	0%
	Human Health - Non-Carcinogen	30Q5	0.00400	0%	0%
	Human Health - carcinogen	Harmonic Mean	0.00400	0%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	1.5	1.0	1.0
	Aquatic Life - Chronic	7Q10 or 4B3	1.5	1.0	1.0
	Ammonia	30B3 or 30Q10	1.0	1.0	1.0
	Human Health - Non-Carcinogen	30Q5	1.0	1.0	1.0
	Human Health - carcinogen	Harmonic Mean	1.0	1.0	1.0

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.874	0.874	0.874
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	**99%**	0.922	0.922	0.922
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	**99%**	2.2	2.2	2.2
Statistically projected critical discharge concentration (C_e)			13845.73	13845.73	13845.73
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	9556.75	13845.73	13845.73
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	9556.75	13845.73	13845.73
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**YES**	**NO**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)				4	
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			--	4	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		--	1.070	--
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		--	1.070	--
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a-1)$	Acute	--	10,000.0	--
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c-1)$	Chronic	--	10,000.0	--
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute	**99%**	--	1,919.3	--
(99th % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	**99%**	--	3,530.0	--
Limiting LTA, ug/L	used as basis for limits calculation		--	1,919.3	--
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--	--
Average Monthly Limit (AML), ug/L	, where % occurrence prob =	**95%**	**--**	**3862.55**	**--**
Maximum Daily Limit (MDL), ug/L	, where % occurrence prob =	**99%**	**--**	**10000.00**	**--**
Average Monthly Limit (AML), mg/L			**--**	**3.86**	**--**
Maximum Daily Limit (MDL), mg/L			**--**	**10.00**	**--**
Average Monthly Limit (AML), lb/day			**--**	**1.03**	**--**
Maximum Daily Limit (MDL), lb/day			**--**	**2.67**	**--**

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

Facility Name	Jugg Mountain
Facility Flow (mgd)	0.0320
Facility Flow (cfs)	0.0495

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Seasonal Low Flow	Seasonal Spring Flow
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	0	0	6
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	0	0	6
Ammonia	**30B3/30Q10** (seasonal)	0	0	6
Human Health - Non-Carcinogen	**30Q5**			
Human Health - carcinogen	**Harmonic Mean Flow**			

Receiving Water Data		Notes:	Annual Crit. Flows	Seasonal S, F, W Flow	Seasonal Spring Flow
Hardness, as mg/L $CaCO_3$	*** Enter Hardness on WQ Criteria tab ***	5th % at critical flows			
Temperature, °C	Temperature, °C	95th percentile	16.9	15.9	17.48
pH, S.U.	pH, S.U.	95th percentile	7.6	7.7	7.6

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages	AMMONIA, default: cold water, fish early life stages	AMMONIA, default: cold water, fish early life stages
Effluent Data	**Number of Samples in Data Set (n)**		35	24	12
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		2.00	2.37	1.27
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1,220	1,110	1,265
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only				
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**		0.47	0.47	0
	Geometric Mean, µg/L, Human Health Criteria Only				
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	11,374.623	9,644.06	11,374.623
	Aquatic Life Criteria, µg/L	Chronic	3,409.883	3,273.474	3,284.729
	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		--	--	--
Percent River Flow Default Value = **25%**	**Aquatic Life - Acute**	**1Q10**	25%	25%	2%
	Aquatic Life - Chronic	7Q10 or 4B3	--	--	--
	Ammonia	30B3 or 30Q10	25%	25%	2%
	Human Health - Non-Carcinogen	30Q5	--	--	--
	Human Health - carcinogen	Harmonic Mean	--	--	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	1.0	1.0	3.4
	Aquatic Life - Chronic	7Q10 or 4B3	--	--	--
	Ammonia	30B3 or 30Q10	1.0	1.0	3.4
	Human Health - Non-Carcinogen	30Q5	--	--	--
	Human Health - carcinogen	Harmonic Mean	--	--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		1.269	1.375	0.980
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	**99%**	0.877	0.825	0.681
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)-0.5\sigma^2]$, where	**99%**	4.4	6.8	6.2
Statistically projected critical discharge concentration (C_e)			5366.42	7503.47	7791.72
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	5366.42	7503.47	2275.59
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	5366.42	7503.47	2275.59
Reasonable Potential to exceed Aquatic Life Criteria			**YES**	**YES**	**NO**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4	
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			4	4	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		2.000	2.370	--
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		2.000	2.370	--
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	11,374.6	9,644.1	--
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - $C_{u\,x}$ (MZ_c-1)	Chronic	3,409.9	3,273.5	--
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute	**99%**	1,329.5	1,013.4	--
(99th % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	**99%**	1,594.0	1,360.6	--
Limiting LTA, ug/L	used as basis for limits calculation		1,329.5	1,013.4	--
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**3,698**	**3,050**	**--**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**11,375**	**9,644**	**--**
Average Monthly Limit (AML), mg/L			**3.7**	**3.1**	**--**
Maximum Daily Limit (MDL), mg/L			**11.4**	**9.6**	**--**
Average Monthly Limit (AML), lb/day			**0.99**	**0.81**	**--**
Maximum Daily Limit (MDL), lb/day			**3.04**	**2.57**	**--**

Appendix D. Technology Based TSS Effluent Limitation

Performance-based Effluent Limits

INPUT	
LogNormal Transformed Mean:	1.4160
LogNormal Transformed Variance:	0.3340
Number of Samples per month for compliance monitoring:	4
Autocorrelation factor (n_e) (use 0 if unknown):	0
OUTPUT	
E(X) =	4.8695
V(X) =	9.403
VARn	0.0945
MEANn=	1.5357
VAR(Xn)=	2.351
Maximum Daily Effluent Limit:	**15.8**
Average Monthly Effluent Limit:	**7.7**
7.702074537	7.391683153

TSS	
Pollutant (mg/L)	**ln(Pollutant conc)**
4	1.39
8	2.08
20	3.00
3	1.10
3.00	1.10
3	1.10
16	2.77
3	1.10
3	1.10
12	2.48
11	2.40
26	3.26
6	1.79
3.8	1.34
3	1.10
6	1.79
3	1.10
3	1.10
3	1.10
3	1.10
5	1.61
14	2.64
10	2.30
3	1.10
3	1.10
3	1.10
3	1.10
4	1.39
3	1.10
3	1.10
3	1.10
5	1.61
4	1.39
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
4	1.39
3	1.10
19	2.94
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
3	1.10
4	1.39
3	1.10
3.2	1.16
4.00	1.39

Column1	
Mean	1.416236
Standard Error	0.075918
Median	1.098612
Mode	1.098612
Standard Deviation	0.578174
Sample Variance	0.334286
Kurtosis	2.464937
Skewness	1.89474
Range	2.159484
Minimum	1.098612
Maximum	3.258097
Sum	82.14171
Count	58

Appendix E. CWA 401 State Certification

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550
www.deq.idaho.gov

Governor Brad Little
Director John H. Tippets

March 25, 2019

Mike Lidgard
U.S. EPA Region 10
Office of Water and Watersheds
NPDES Permits Unit (OWW-191)
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Subject: Draft 401 Water Quality Certification for Jug Mountain, LLC ID-0028029

Dear Mr. Lidgard:

The Boise Regional Office of the Department of Environmental Quality (DEQ) has reviewed the above-referenced proposed draft permit for Jug Mountain LLC. Section 401 of the Clean Water Act requires that states issue certifications for activities which are authorized by a federal permit and which may result in the discharge to surface waters. In Idaho, DEQ is responsible for reviewing these activities and evaluating whether the activity will comply with Idaho's Water Quality Standards, including any applicable water quality management plans (e.g., total maximum daily loads). A federal discharge permit cannot be issued until DEQ has provided certification or waived certification either expressively, or by taking no action.

This letter is to inform you that DEQ is issuing the attached draft 401 certification subject to the terms and conditions contained therein.

Please contact me directly at (208) 373-0420 or via email at Aaron.Scheff@deq.idaho.gov to discuss any questions or concerns regarding the content of this draft certification.

Sincerely,

Aaron Scheff
Regional Administrator
Boise Regional Office

cc: John Drabek, EPA Region 10
Susan Poulsom, EPA Region 10

ec: Loren Moore, DEQ State Office
CM#: 2018AKF55

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

March 25, 2019

NPDES Permit Number(s): ID0028029 Jug Mountain Ranch, LLC

Receiving Water Body: Cold Creek tributary to Boulder 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, 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 I 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 I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II 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 III 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 I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

Jug Mountain Ranch discharges the following pollutants of concern: 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), *E.coli* bacteria, pH, ammonia, nitrite, total kjeldahl nitrogen, and total phosphorus (TP). Effluent limits have been developed for all of these pollutants.

Receiving Water Body Level of Protection

The Jug Mountain Ranch discharges to the Cascade Lake Reservoir and its tributaries within the North Fork Payette Subbasin assessment unit (AU) 17050123SW011_02 (Boulder/Willow Creek—1st and 2nd order irrigated sections). This AU has not yet been designated. Because DEQ presumes most waters in the state will support cold water aquatic life and primary or secondary contact recreation beneficial uses, undesignated waters are protected for these uses (IDAPA 58.01.02.101.01.a). In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2014 Integrated Report, this AU is not fully supporting one or more of its presumed uses. The aquatic life use is not fully supported. Causes of impairment include total phosphorus. The contact recreation beneficial use is fully supported. As such, DEQ will provide Tier I protection (IDAPA 58.01.02.051.01) for the aquatic life use and Tier II protection (IDAPA 58.01.02.051.02) in addition to Tier I for the contact recreation use (IDAPA 58.01.02.052.05.c).

Protection and Maintenance of Existing Uses (Tier I Protection)

A Tier I 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 and designated uses and the level of water quality necessary to protect existing and designated uses shall be maintained and protected. In order to protect and maintain existing and designated 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 existing and designated beneficial uses. The effluent limitations and associated requirements contained in the Jug Mountain Ranch permit are set at levels that provide reasonable assurance the discharge will comply with the narrative and numeric criteria in the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point

source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL.

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04).

The EPA-approved *Cascade Reservoir-Phase I Watershed Management Plan* (DEQ 1996) and *Cascade Reservoir, Phase II Watershed Management Plan* (DEQ 1998) established phosphorus wasteload allocations for point sources. The wasteload allocations in these TMDLs were designed to ensure the Cascade Lake Reservoir and its tributaries would achieve the water quality necessary to support its existing and designated aquatic life beneficial uses and comply with the applicable numeric and narrative criteria.

The 1996 and 1998 TMDLs were completed prior to the Jug Mountain development; therefore Jug Mountain did not receive a wasteload allocation for TP. Additionally, since the TMDLs did not incorporate a reserve for growth, the TMDL requires new discharges to offset 30% of the nonpoint phosphorus loads from the land on which the facility is located in addition to a no-net-increase in phosphorus loading from their facility. In accordance with this requirement, Jug Mountain is able to offset its phosphorus load and meet the no-net increase requirement through a grazing management plan, streambank stability, and riparian habitat improvements. The effluent limitations and associated requirements contained in the Jug Mountain Ranch draft permit are set at levels that comply with the no-net-increase requirements for discharges that were not included in the 1996 and 1998 TMDLs.

The 2011 *Cascade Reservoir Tributary TMDL Addendum* was completed to address the sediment loading from tributaries, including the Boulder Creek subwatershed, into the Cascade Reservoir. Boulder Creek received a bank stability target of 80% to address the nonpoint sources of sediment in the watershed. The discharge from Jug Mountain is not expected to impact bank stability and implementation of the grazing management plan is expected to offset phosphorus loading. To date, Jug Mountain has inherently improved bank stability in the watershed as the result of changes in grazing management to reduce historical grazing.

In sum, the effluent limitations and associated requirements contained in the Jug Mountain Ranch permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the Cascade Reservoir 1996 and 1998 TMDLs. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Cascade Lake Reservoir and its tributaries in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

High-Quality Waters (Tier II Protection)

The Cascade Lake Reservoir and its tributaries are considered high quality for recreation. As such, the water quality relevant to recreation uses of the Cascade Lake Reservoir and its tributaries 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 recreation uses of the Cascade Lake

Reservoir and its tributaries (IDAPA 58.01.02.052.05). These include the following: bacteria and total phosphorus**.** Effluent limits are set in the proposed and existing permit for these pollutants.

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. 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

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 Jug Mountain Ranch permit, this means determining the permit's effect on water quality based upon the limits for bacteria and total phosphorus 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. Comparison of current and proposed permit limits for pollutants of concern relevant to uses receiving Tier II protection.

Pollutant	Units	Current Permit			Proposed Permit			Change[a]
		Average Monthly Limit	Average Weekly Limit	Single Sample Limit	Average Monthly Limit	Average Weekly Limit	Single Sample Limit	
Pollutants with limits in both the current and proposed permit								
E. coli	no./100 mL	126		406	126		406	NC
Total Phosphorus	mg/l	3	—	—	3	—	—	NC
	lb/day	1.8	—	—	1.8	—	—	

[a] NC = no change.

The proposed permit limits for other pollutants of concern that have limits in Table 1, *E. coli* and total phosphorus, are the same as those in the current permit ("nc" in change column). Therefore, it is unlikely that any adverse change in water quality or significant degradation will result from the discharge of these pollutants.

In sum, DEQ concludes that this discharge permit complies with the Tier II provisions of Idaho's WQS (IDAPA 58.01.02.051.02 and IDAPA 58.01.02.052.06).

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 2% mixing zone for ammonia.

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 Kati Carberry, Boise Regional Office, (208) 373-0434, **Kati.Carberry@deq.idaho.gov**

Draft

Aaron Scheff
Boise Regional Administrator
Boise Regional Office