Fact Sheet for IPDES Permit No. ID0028487

06/01/2020

Idaho Department of Environmental Quality (DEQ) proposes to issue an Idaho Pollutant Discharge Elimination System (IPDES) Permit to discharge pollutants pursuant to the provisions of IDAPA 58.01.25 to:

Emida Water and Sewer Association, Inc.
Highway 6 and Blackwell R.R. Lane
Emida, ID 83830

Public Comment Start Date:	03/18/2020
Public Comment Expiration Date:	04/17/2020
Technical Contact:	Karen Jackson 208-373-0382 Karen.jackson@deq.idaho.gov

Purpose of this Fact Sheet

This fact sheet explains and documents the decisions the Idaho Department of Environmental Quality (DEQ) made in writing the Idaho Pollutant Discharge Elimination System (IPDES) permit for Emida Water and Sewer Association, Inc.

This fact sheet complies with IDAPA 58.01.25.108.02 of the Idaho Administrative Code, which requires DEQ to prepare a permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

Table of Contents

List of Tables

Acronyms

1Q10	1-day, 10 year low flow
7Q10	7-day, 10 year low flow
30Q5	30-day, 5 year low flow
30Q10	30-day, 10 year low flow
AML	Average Monthly Limit
ASR	Alternative state requirement
AU	Assessment unit
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
DMR	Discharge Monitoring Report
EPA	U.S. Environmental Protection Agency
IDAPA	Refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
IPDES	Idaho Pollutant Discharge Elimination System
lb/day	Pounds per day
LTA	Long Term Average
MDL	Method Detection Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
mL	Milliliters
MPN	Most probably number
O&M	Operations and maintenance
POC	Pollutant(s) of Concern
POTW	Publicly Owned Treatment Works
QAPP	Quality Assurance Project Plan

RPA	Reasonable Potential Analysis
RPMF	Reasonable Potential Multiplication Factor
RPTE	Reasonable Potential To Exceed
SIU	Significant Industrial User
s.u.	Standard Units
TBEL	Technology Based Effluent Limits
TES	Treatment equivalent to secondary
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQC	Water Quality Criteria
WQS	Water Quality Standards
WWTF	Wastewater treatment facility

1 Introduction

This fact sheet provides information on the permit for the Idaho Department of Environmental Quality (DEQ) Idaho Pollutant Discharge Elimination System (IPDES) permit for Emida Water and Sewer Association, Inc. Wastewater Treatment Facility (Emida WWTF). This fact sheet complies with the Rules Regulating the Idaho Pollutant Discharge Elimination System Program (IDAPA 58.01.25), which requires DEQ to prepare a permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

DEQ proposes to issue the IPDES permit for Emida WWTF. To ensure protection of water quality and human health, the permit places conditions on the type, volume, and concentration of pollutants discharged from the facility to waters of the United States.

This fact sheet includes:

- a map and description of the discharge location;
- a listing of effluent limits and other conditions the facility must comply with;
- documentation supporting the effluent limits;
- technical material supporting the conditions in the permit; and
- information on public comment, public hearing, and appeal procedures.

Terms used in this fact sheet are defined in Section 5, Definitions, of the permit.

Public Comment

The permit application, permit, and fact sheet describing the terms and conditions applicable to the permit are available for public review and comment during a public comment period. The public is provided at least 30 days to provide comments to DEQ. Persons wishing to request a public meeting for this facility's permit must do so in writing within 14 calendar days of public notice being published that a permit has been prepared; requests for public meetings must be submitted to DEQ by 04/01/2020. Requests for extending a public comment period must be provided to DEQ in writing before the last day of the comment period. For more details on preparing and filing comments about these documents, please see the IPDES guidance *Public Participation in the Permitting Process* at *http://www.deq.idaho.gov/media/60178029/ipdes-public-participation-permitting-process-0216.pdf*. For more information, please contact the permit writer.

After the close of the public comment period, DEQ considers information provided by the public, prepares a document summarizing the public comments received, and may make changes to the permit in response to the public comments. DEQ will include the summary and responses to comments in Appendix D of the final fact sheet. DEQ may request more information from the applicant in order to respond to public comments (IDAPA 58.01.25.109.02.h.).After the public comment period and prior to issuing the final permit decision, DEQ will also provide the applicant an opportunity to submit additional information to address proposed changes and support the response to public comments. DEQ will assess the public comment in conjunction with any additional information received from the applicant and develop a proposed permit.

The Environmental Protection Agency (EPA) may take up to 90 days from the publication of public notice of the permit to develop and document specific grounds for objections to a proposed permit. If EPA objects to a proposed permit DEQ must satisfactorily address the objections within the time period specified in the memorandum of agreement between EPA and DEQ (40 CFR 123.44). Otherwise, EPA may issue a permit in accordance with 40 CFR 121, 122, 124. If EPA issues the permit, any state, interstate agency, or interested person may request EPA hold a public hearing regarding the objection.

Permit Issuance

Following the public comment period(s) on a permit and after receipt of any comments on the proposed permit from EPA, DEQ will issue a final permit decision, the final permit, and the fact sheet. All comments received will be addressed in Appendix D of the final fact sheet and any resulting changes to the permit or fact sheet documented. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit (IDAPA 58.01.25.107.04.). The final permit and final fact sheet will be posted on the DEQ webpage. Response to comments will be located in the final fact sheet as an appendix.

The permit holder or applicant and any person or entity who filed comments or who participated in a public meeting on the permit may file a petition for review of a permit decision as outlined in Appendix C. The petition for review must be filed with DEQ's hearing coordinator within 28 days after DEQ serves notice of the final permit decision. Any party that participated in the petition for review that is still aggrieved by the final IPDES action or determination has a right to file a petition for judicial review (IDAPA 58.01.25.204.26).

Documents are Available for Review

The IPDES permit and fact sheet can be reviewed or obtained by visiting or contacting the DEQ State office between 8:00 a.m. and 5:00 p.m., Monday through Friday at the address below. The permit and fact sheet can also be found by visiting the DEQ website at *http://www.deq.idaho.gov/news-public-comments-events/*.

DEQ
1410 N. Hilton St.
Boise, ID 83706
Ph: 208-373-0502
Toll-free: 1-888-800-3480

The fact sheet and permits are also available at the DEQ Regional Office:

Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
Ph: 208-769-1422
Toll-free: 1-888-370-0017

Disability Reasonable Accommodation Notice

For technical questions regarding the permit or fact sheet, contact the permit writer at the phone number or e-mail address at the beginning of this fact sheet. Those with impaired hearing or

speech may contact a TDD operator at 1-800-833-6384 (ask to be connected to the permit writer at the above phone number). Additional services can be made available to a person with disabilities by contacting the permit writer.

Background Information

Facility Description

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

Table 1. Facility information.

Permittee	Emida Water and Sewer Association, Inc.
Facility Physical Address	Highway 6 and Blackwell R.R. Lane Emida, ID 83830
Facility Mailing Address	160 S. Main Avenue St. Maries, ID 83861
Facility Contact	Leonard Johnson Operator 208-818-6875
Responsible Official	Tara Fuller Board President 208-582-2176
Facility Location	Latitude: 47.119332°N Longitude: 116.594688°W
Receiving Water Name	Santa Creek
Outfall Location	Latitude: 47.120334°N Longitude: 116.594268°W
Permit Status	
Application Submittal Date	June 28, 2012
Date Application Deemed Complete	July 3, 2012

Emida Water and Sewer Association, Inc. is a privately owned, incorporated treatment works wastewater treatment facility (WWTF) located in Emida, Benewah County, Idaho. Leonard Johnson assists with the operation of the WWTF. The collection system has no combined sewers. The facility serves a resident population of 85 based on a 2015 EPA NPDES inspection report. The facility accepts only domestic wastewater.

1.1.1 Facility Information

The design flow of the facility is 0.0104 mgd according to the 1988 permit fact sheet. The most recent permit application lists the design flow as 0.01 mgd. The more specific design flow of 0.0104 mgd was used for permit calculations. The treatment process consists of a single-celled waste stabilization pond and chlorine contact chamber used to treat domestic wastewater. Details about the wastewater treatment process and a map showing the location of the treatment facility

and discharge are included in Appendix A. Because of the facility's design flow, the facility is considered a minor facility.

The facility was designed to serve a population equivalent to 104 people, an annual average design flow of 0.01 mgd, and treatment of 21 lb/day for both five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS). The design BOD_5 removal rate is 65%. Currently there are no influent or effluent flow data for the facility, and there are 34 active connections based on billing records. The permit authorizes discharge from October 16 through May 31.

1.1.2 Permit History

The WWTF was initially issued an NPDES permit on March 20, 1974 under the NPDES permit number ID0022438. This permit was modified on January 1, 1977 and reissued on June 30, 1988. During the 1988 reissuance, DEQ requested there be no permitted discharge from June 1 to October 15, citing a 1980 Santa Creek Effluent Limitation Study that found a 50:1 dilution was necessary to protect current and future beneficial uses, but could not be attained between August 18 and October 15. NPDES coverage remained in effect until June 29, 1993. The permit will retain the seasonal discharge period October 16 to May 31 to continue protecting beneficial uses and prevent antidegradation and antibacksliding.

The EPA received an NPDES permit application on June 28, 2012, and the application was deemed complete on July 3, 2012. A new permit number ID0028487 was assigned at this time and will be the new IPDES permit number, as well.

1.1.3 Compliance History

No past DMR data were found to review compliance history. A compliance inspection of the facility was conducted by EPA Region 10 on May 21, 2015. The inspection encompassed a review of the 1971 lagoon blueprint design and a facility walk-through. The results of the inspection revealed one area of concern of potential: failure to identify and manage a regulated waste or pollutant from the lagoon during wet weather events.

1.1.4 Sludge/Biosolids

The EPA Region 10, under the authority of the CWA, issues separate sludge-only permits for the purpose of regulating biosolids. Permits for sludge management are independent of IPDES discharge permits and must be obtained from EPA. The IPDES program will take over permitting of sludge/biosolids in July 2021. The treatment lagoon has no sludge monitoring data or plan, and there is no knowledge of sludge disposal to date.

If sludge removal is required, a sludge management plan must be developed and submitted to DEQ as outlined in section 7.3, and must follow the procedures in IDAPA 58.01.16.

1.1.5 Outfall Description

The facility outfall was historically permitted to discharge continuously from October 16 through May 31 through an overflow discharge pipe installed in the contact chamber that discharges on the west bank of Santa Creek at 47.120334°N, 16.594268°W. The facility only discharges when water levels in the lagoon are high. The outfall is an approximately 10-inch diameter metal pipe with a surcharge prevention flap.

1.1.6 Wastewater Influent Characterization

No past DMR data were found to review influent characterization.

1.1.7 Wastewater Effluent Characterization

The 1988 permit effluent limits were based on Equivalent to Secondary Treatment limits for BOD_5 and alternative state standards for TSS. The lagoon was designed for 65% removal efficiency for BOD_5 and TSS. No past DMR data or existing data sources were found to review effluent characterization.

Description of Receiving Water

The Emida WWTF discharges to Santa Creek in the St. Joe subbasin (HUC 17010304) Water Body Unit P-10 Santa Creek – source to mouth (Assessment Unit ID17010304PN010_03). At the point of discharge, the Santa Creek is protected for the following designated uses (IDAPA 58.01.02.110.11 P-10):

- Cold water aquatic life
- Salmonid spawning
- Primary contact recreation

The outfall is located approximately 10 miles upstream of the confluence of Santa Creek and the St. Maries River. For more information on the outfall see section 2.15, Outfall Description. There are no other nearby point sources upstream of the facility. Nearby non-point sources of pollutants include silviculture and agriculture. There are no nearby drinking water intakes. Section 2.2.1 describes any receiving waterbody impairments.

There are no active United States Geological Survey (USGS) gage stations upstream to collect ambient background data.

1.1.8 Water Quality Impairments

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 (WLAs) 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 limits that are consistent with the assumptions and requirements of WLAs that have been assigned to the discharge in an EPA-approved TMDL.

The EPA-approved *St. Joe River Subbasin Assessment and Total Maximum Daily Loads* (DEQ 2003), *St. Maries River Subbasin Assessment and Total Maximum Daily Loads* (DEQ 2003b) and the *St. Joe River Subbasin Temperature Total Maximum Daily Loads Addendum to the St. Joe River Subbasin Assessment and Total Maximum Daily Loads and St. Maries River Subbasin Assessment and Total Maximum Daily Loads* (DEQ 2011) establish WLAs for TSS and temperature (see sections 3.3.3.3 and 3.3.3.4). These WLAs are designed to meet narrative and numeric criteria and ultimately help restore the water body to a condition that supports existing and beneficial uses. The effluent limits and associated requirements contained in the permit are set at levels that are consistent with the TMDL.

1.1.9 Critical Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits (WQBELs). In general, Idaho's water quality standards (WQS) require criteria be evaluated at the following low flow design conditions (See IDAPA 58.01.02.210.03) as shown in Table 2. The 1Q10 represents the lowest one day flow with a recurrence frequency of once in 10 years. The 7Q10 represents lowest average seven consecutive day flow with a recurrence frequency of once in 10 years. The 30Q5 represents the lowest average 30 consecutive day flow with a recurrence frequency of once in five years. 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. The 30Q10 represents the lowest average 30 consecutive day flow with a recurrence frequency of once in 10 years.

For this permit, DEQ determined critical low flows upstream of the discharge using USGS Streamstats and the Low-Flow Statistics Flow Report in Appendix B. The estimated low flows are presented in Table 2. Seasonal flows are not available through the Streamstats program.

Table 2. Low flow design conditions.

Criteria	Flow Condition	Annual Critical Flow (cfs)
Acute aquatic life	1Q10	1.88
Chronic aquatic life	7Q10	2.37
Non-carcinogenic human health criteria	30Q5	3.38
Ammonia	30Q5, or 30Q10	3.38
Source: USGS Streamstats		

Pollutants of Concern

DEQ may identify pollutants of concern (POC) for the discharge based on, but not limited to, those which:

- Have a technology-based limit (TBEL)
- Have an assigned WLA from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring data reported in the application, DMRs, or special studies
- Are expected to be in the discharge based on the nature of the discharge
- Are impairing the beneficial uses of the receiving water

To determine POCs for further analysis, DEQ evaluated all pertinent and available information such as the previous permits, TMDLs, and the facility's industrial user surveys. The wastewater treatment process for this facility includes a single waste stabilization lagoon. Pollutants expected in the discharge from a facility with this type of treatment are:

- BOD_5
- Total suspended solids (TSS)
- *E. coli* bacteria
- Total residual chlorine (TRC)
- pH
- Temperature
- Ammonia
- Phosphorus

Effluent Limits and Monitoring

Table 3 presents the effluent limits and monitoring requirements in the 1988 Permit. Table 4 presents the effluent limits and monitoring requirements in the 2020 permit.

Table 3. 1988 Permit - Effluent Limits and Monitoring Requirements (October 16 to May 31).

Parameter	Effluent Limits			Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Sample Location	Sample Frequency	Sample Type
Flow, mgd	—	—	—	Influent or Effluent	5/week	Instantaneous measurement
BOD_5, 65% removal	45 mg/L	65 mg/L	—	Influent and Effluent	1/month	Grab
	7 lb/day	11 lb/day	—			
TSS	70 mg/L	105 mg/L	—	Effluent	1/month	Grab
Fecal coliform Oct 16 – April 30	100/100 mL	200/100mL	—	Effluent	1/month	Grab
Fecal coliform May 1 – May 31	50/100 mL	100/100mL	—	Effluent	1/month	Grab
TRC	—	—	0.5 mg/L	Effluent	5/week	Grab
pH	6.0 s.u -9.0 s.u.			Effluent	1/week	Grab

1. There shall be no discharge of floating solids or visible foam in other than trace amounts.
2. 65% Removal: The monthly average effluent BOD5 load shall not exceed 35% of the monthly average influent BOD5 load. Sample collection and reporting shall be conducted in accordance with the monitoring requirements if Part I.B.
3. No direct discharge to Santa Creek shall be allowed from June 1 through October 15.

Table 4. 2020 Permit - Effluent Limits and Monitoring Requirements (October 16 through May 31).

Parameter	Discharge Period	Units	Effluent Limits						Monitoring Requirements		Reporting Period (DMR Months)
			Monthly Average	Weekly Average	Monthly Geometric Mean	Instantaneous Minimum	Instantaneous Maximum	Daily Maximum	Sample Type	Sample Frequency	
Biochemical Oxygen Demand (BOD_5)	10/16 to 05/31	mg/L	30	45	—	—	—	—	Grab[a]	2/month	Monthly Reporting (Jan, Feb, Mar, Apr, May, Oct, Nov, Dec)
		lb/day	2.6	3.9	—	—	—	—	Calculation[b]		
BOD_5 Percent Removal	10/16 to 05/31	%	85 (minimum)	—	—	—	—	—	Calculation[c]	1/month	
Total Suspended Solids (TSS)	10/16 to 05/31	mg/L	30	45	—	—	—	—	Grab[a]	2/month	Monthly Reporting (Jan, Feb, Mar, Apr, May, Oct, Nov, Dec)
		lb/day	2.6	3.9	—	—	—	—	Calculation[b]		
TSS Percent Removal	10/16 to 05/31	%	85 (minimum)	—	—	—	—	—	Calculation[c]	1/month	
E. coli[d]	10/16 to 05/31	#/100 ml	—	—	126[e,f]	—	—	—	Grab[a]	5/month	Monthly Reporting (Jan, Feb, Mar, Apr, May, Oct, Nov, Dec)
pH	10/16 to 05/31	standard units (s.u.)	—	—	—	6.5[f]	9.0[f]	—	Grab[a]	2/week	Monthly Reporting (Jan, Feb, Mar, Apr, May, Oct, Nov, Dec)
TRC[g]	10/16 to 05/31	mg/L	0.286[f]	—	—	—	—	0.500[f]	Grab[a]	1/week	Monthly Reporting (Jan, Feb, Mar, Apr, May, Oct, Nov, Dec)
		lb/day	0.025[ef]	—	—	—	—	0.042[f]	Calculation[b]		

a. A grab sample is an individual sample collected over a 15-minute period or less. Grab sample may be taken for effluents from holding ponds or other impoundments with a retention period greater than twenty-four (24) hours
b. Calculation - Calculated means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in mgd) X Conversion Factor (8.34) = lb/day
c. % Removal = ([Influent](mg/L)-[Effluent](mg/L))/([Influent](mg/L))×100%
Braces "[ ]" indicate concentration of the attribute contained inside
d. Idaho's water quality standards for primary contact recreation include a single sample value of 406 #/100 ml. Exceedance of this value indicates likely exceedance of the 126 #/100 ml average monthly effluent limit. If this value is exceeded at any point within the month, the facility should consider collecting more than the 5 samples per month required in this permit to determine compliance with the monthly geometric mean according to IDAPA 58.01.02.251.01.a
e. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every 3 – 7 days within a calendar month.
f. Exceedance of a maximum daily limit, instantaneous maximum limit, or instantaneous minimum limit requires 24-hour reporting in accordance with 2.2.7. For *E. coli*, the maximum daily threshold that triggers 24-hour reporting is 406/100 mL. Please see 2.2.7 for additional 24-hour reporting requirements
g. TRC has a compliance schedule, see Section 5.1 of the fact sheet and Section 3.1 of the permit.

Table 5. Pollutants with interim effluent limits for Outfall 001.

Parameter	Interim Limit Period	Units	Effluent Limits			Monitoring Requirements		Reporting Period (DMR Months)
			Average Monthly	Average Weekly	Maximum Daily	Sample Type	Sample Frequency	
TRC[a]	10/16 to 05/31	mg/L	0.50	0.75	---	Grab[b]	1/week	Monthly Reporting (Jan, Feb, Mar, Apr, May, Oct, Nov, Dec)
		lb/day	0.04	0.065	---	Calculation[c]		

a. See Section 5.1 for additional compliance schedule requirements. Final limits must be met by 05/31/2027.
b. Grab means an individual sample collected over a fifteen (15) minute, or less, period.
c. Calculation means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in mgd) X Conversion Factor (8.34) = lb/day

Basis for Effluent Limits

Regulations require that effluent limits in an IPDES permit must be either technology-based or water quality-based.

TBELs are set according to the level of treatment that is achievable using available technology. TBELs are based upon the treatment processes used to reduce specific pollutants. TBELs are set by the EPA and published as a regulation. DEQ may develop a TBEL on a case-by-case basis (40 CFR 125.3, IDAPA 58.01.25.302, and IDAPA 58.01.25.303). This permit uses best professional judgement (BPJ) to apply secondary treatment TBELs for publically owned treatment works (POTW) to the Emida WWTF. As described in section 2.1.1 the WWTF was originally designed as POTW and only receives domestic waste.

WQBELs are calculated so the effluent will comply with the Surface Water Quality Standards (IDAPA 58.01.02) or the National Toxics Rule (40 CFR 131.36) applicable to the receiving water.

DEQ must apply the most stringent of these limits to each POC. These limits are described below.

Technology-Based Effluent Limits

IDAPA 58.01.25.302 requires that IPDES permits include applicable TBELs and standards, while IDAPA 58.01.25 states that TBELs for POTWs must be based on secondary treatment standards or as specified in 40 CFR 133. The following section explains secondary treatment effluent limits for the conventional pollutants discharged by POTWs: 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. These effluent limits are given in 40 CFR 133 and are outlined in Table 6.

Table 6. Secondary treatment effluent limits.

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

The facility was previously permitted using equivalent to secondary treatment limits, and there have been no significant changes or upgrades to the facility since the last permit issuance. While there have been no significant changes, there are also no data to evaluate if the facility continues to meet the three requirements for treatment equivalent to secondary (TES) listed under 40 CFR 133.101(g), which are:

"Facilities eligible for treatment equivalent to secondary treatment. Treatment works shall be eligible for consideration for effluent limitations described for treatment equivalent to secondary treatment (§ 133.105), if:

(1) The BOD_5 and SS effluent concentrations consistently achievable through proper operation and maintenance (§ 133.101(g)) of the treatment works exceed the minimum level of the effluent quality set forth in § 133.102(a) and 133.102(b),

(2) A trickling filter or waste stabilization pond is used as the principal process, and

(3) The treatment works provide significant biological treatment of municipal wastewater. Significant biological treatment (§133.101(k)) is defined as the use of an aerobic or anaerobic biological treatment process in a treatment works to consistently achieve a 30-day average of at least 65 percent removal of BOD_5."

The effluent limits for equivalent to secondary treatment from 40 CFR 133.105(a) and 40 CFR 133.105(b) are listed in Table 7.

Table 7. Equivalent to secondary treatment effluent limits (40 CFR 133.105).

Parameter	30-day average	7-day average
BOD_5	45 mg/L	65 mg/L
TSS	45 mg/L	65 mg/L
Removal for BOD_5/$cBOD_5$ and TSS (concentration)	65% (minimum)	—
pH	within the limits of 6.0 - 9.0 s.u.	

The rationale for how Emida WWTF does not meet the three conditions is explained below:

Rationale for condition (1) from 40 CFR 133.101(g) above:

At this time, it is unknown whether or not the facility effluent quality exceeds the effluent quality shown in Table 6.

Rationale for condition (2) from 40 CFR 133.101(g) above:

The facility meets the condition because the facility utilizes a waste stabilization pond as the principle process of treating wastewater.

Rationale for condition (3) from 40 CFR 133.101(g) above:

At this time, there are no percent removal data, and significant biological treatment cannot be demonstrated.

Additionally, a facility may be eligible for a lower percent removal limit in accordance with 40 CFR 133.103(d):

"The …State Director is authorized to substitute either a lower percent removal requirement or a mass loading limit for the percent removal requirements set forth in §§ 133.102(a)(3), 133.102(a)(4)(iii), 133.102(b)(3), 102.105(a)(3), 133.105(b)(3) and 133.105(e)(1)(iii) provided that the permittee satisfactorily demonstrates that:

(1) The treatment works is consistently meeting, or will consistently meet, its permit effluent concentration limits but it's percent removal requirements cannot be met due to less concentrated influent wastewater,

(2) to meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards, and

(3) the less concentrated influent wastewater is not the result of excessive I/I."

Rationale for 40 CFR 133.103(d):

At this time, there are no data to determine influent concentration or demonstrate a presents or absence of excessive I/I, thus a lower percent removal requirement is not included in this permit.

Based on this rationale, the facility will be authorized for secondary treatment standard TBELs shown in Table 6. Treatment equivalent to secondary (TES) standards will be evaluated during the next permit cycle to determine their applicability.

1.1.10 Mass-Based Limits

IDAPA 58.01.25.303.06 requires that effluent limits be expressed in terms of mass, except under certain conditions. IDAPA 58.01.25.303.02 requires that effluent limits 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[i]

Since the design flow for this facility is 0.0104 mgd, the technology-based mass limits for:

BOD_5:

Average Monthly Limit = 30 mg/L × 0.0104 mgd × 8.34 = 2.6 lb/day

Average Weekly Limit = 45 mg/L × 0.0104 mgd × 8.34 = 3.9 lb/day

TSS:

Average Monthly Limit = 30 mg/L × 0.0104 mgd × 8.34 = 2.6 lb/day

Average Weekly Limit = 45 mg/L × 0.0104 mgd × 8.34 = 3.9 lb/day

Water Quality-Based Effluent Limits

1.1.11 Statutory and Regulatory Basis

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limits in permits necessary to meet WQS. The IPDES regulation IDAPA 58.01.25.302.06 implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any WQS including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected

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

States other than the State in which the discharge originates, which may include downstream States (IDAPA 58.01.25.103.03, IDAPA 58.01.25.302.06, see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and non-point 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 WQS are met and must be consistent with any available TMDL WLA for the discharge. If there are no approved TMDLs that specify WLAs for this discharge, all of the WQBELs are calculated directly from the applicable WQS.

1.1.12 Reasonable Potential Analysis (RPA) and Need for Water Quality-Based Effluent Limits

DEQ uses the process described in the *Effluent Limit Development Guidance* (DEQ 2017) 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 (WQC) for a given pollutant, DEQ compares the maximum projected receiving water concentration to the WQC for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL 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 may be exceeded (IDAPA 58.01.02.060). 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 RPA and WQBEL calculations were based on mixing zones shown in Table 8. The equations used to conduct the RPA and calculate the WQBELs are provided in Appendix B. If DEQ revises the allowable mixing zone before final issuance of the permit, the RPA and WQBEL calculations will be revised accordingly.

This facility dilution factor (when using 25% of the critical low flow) for the 1Q10 flow is 30. In accordance with the Idaho Mixing Zone Implementation Guidance this facility falls under Level 1 for mixing zone analysis, which consists of the mass balance analysis done during RPA. See the mixing zone analysis in Appendix B.

Table 8. Authorized mixing zones for Outfall 001.

Parameter	Discharge Period	Authorized Mixing Zone (% of Critical Low Flow)			
		Aquatic Life		Human Health	
		Acute (1Q10)	Chronic (7Q10)	Water and Fish (30Q5)	Fish Only (30Q5)
TRC	10/16 – 05/31	25% of 1.88 cfs	25% of 2.37 cfs	NA	NA

1.1.13 Reasonable Potential and Water Quality-Based Effluent Limits

The reasonable potential and WQBELs for specific parameters are summarized below.

1.1.13.1 E. coli

The Idaho WQS states that waters of the State of Idaho that are designated for recreation (primary or secondary) are not to contain *E. coli* bacteria in concentrations exceeding a geometric mean of 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a 30-day period. A mixing zone is not appropriate for bacteria for waters designated for contact recreation. Since a mixing zone is not appropriate, an RPA was not conducted and end-of-pipe limits are included in this permit. There are no TBELs for fecal coliform or *E. coli*, therefore, the permit contains a monthly geometric mean WQBEL for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho WQS 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 WQS. For waters designated for primary contact recreation, the single sample maximum value is 406 organisms per 100 mL (IDAPA 58.01.02.251.01.b.ii.). For waters designated only for secondary contact recreation the single sample maximum value is 576 organisms per 100 mL (IDAPA 58.01.02.251.01.b.i.).

Monitoring of the effluent five times per month will ensure compliance with the criterion can be assessed. If the single sample maximum is exceeded, the permittee may choose to monitor more frequently than the permit requires ensuring adequate disinfection and compliance with permit effluent limits.

Regulations at IDAPA 58.01.25.303.04 require that effluent limits 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 IDAPA 58.01.25.010.06 and 07, respectively, as 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. Therefore, the permit monthly effluent limit is a geometric mean for *E. coli* of 126 organisms per 100 ml.

1.1.13.2 pH

The Idaho WQS at IDAPA 58.01.02.250.01.a require pH values of the receiving water to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH; therefore the most stringent WQC must be met before the effluent is discharged to the receiving water.

1.1.13.3 TSS

The *St. Maries River Subbasin Assessments Total Maximum Daily Loads* (DEQ 2003b) allocates the Emida WWTF a TSS load of 6.8 tons/year (Table 25, page 67 of the St. Maries TMDL). This allocation was calculated from an assumed design discharge of 0.15 mgd. The actual design discharge is an order of magnitude smaller than this assumption (0.0104 mgd), making the WQBEL based on the TMDL WLA larger than appropriate. The average monthly and average weekly TES TBEL for TSS is more limiting, and will be in the permit as well as the annual average TMDL WLA to be consistent with the TMDL.

The St. Maries TMDL allocates 37.5 lb/day and 6.8 tons/year of sediment (TSS) to the Emida WWTF. In translating the TMDL WLA into permit limits, the ELDG and TSD procedures were followed. The first step in developing limits is to determine the time frame over which the WLAs apply. The TMDL expresses this TSS WLA as an annual load (6.8 tons/year). The TSS WLA can be expressed as an annual average using the following calculation:

$$\frac{6.8\ ton}{1\ year} \times \frac{2000\ lbs}{1\ ton} \times \frac{1\ year}{365\ days} = 37.5 \frac{lbs}{day}$$

This number is incorporated directly into the permit as an annual average limit. IDAPA 58.01.25.303.04.b requires that permit limits for POTWs be expressed as average monthly limits (AMLs) and average weekly limits (AWLs), unless impracticable. The WLA must be statistically converted to an AML and AWL (also see Table 18 in Appendix B).

Calculating AML:
The AML can be calculated by setting the annual average equal to the chronic Long Term Average (LTA_c).
TSS TMDL WLA = LTA = 37.5 lb/day

$$AML = LTA_m \times e^{(z_{95}\sigma_n - 0.5\sigma_n^2)} \qquad \textit{(Equation 37 in the ELDG)}$$

Where:
CV = coefficient of variation = 0.6 (see section 3.1.2.2 of the ELDG)
n = 2 (number of samples in a month)
$\sigma_2^2 = \ln(CV^2/n + 1) = \ln(0.6^2/6 + 1) = 0.166$
$\sigma_2 = 0.407$
Z = percentile exceedance probability for AML (95%) = 1.645
AML = 37.5 × exp(1.645 × 0.407) - (0.5 × 0.166)
AML = 67.4 lb/day

Calculating the AWL:
The AWL is calculated by multiplying the AML by the following relationship (from Table 5-3 of the TSD):

$$\text{AWL} = AML \times \frac{e^{\left[Z_{AWL}\times\sigma_n - \frac{0.5\times\sigma^2_{n/4}}{4}\right]}}{e^{[Z_{AML}\times\sigma_n - 0.5\times\sigma^2_n]}}$$

Where:

CV = 0.6 (see section 3.1.2.2 of the ELDG)
σ_2^2 = ln(CV^2/n +1) = ln(0.6^2/2+1) = 0.166
σ_2 = 0.407
Z = percentile exceedance probability for AML (95%) = 1.645
n/4 = number of samples per week = 0.5
$\sigma_{n/4}^2$ = ln(CV^2/(n/4) +1) = ln(0.6^2/(2/4) +1) = 0.307
$\sigma_{n/4}$ = 0.555
Z_{AWL} = percentile exceedance probability for AWL (99%) = 2.326
Z_{AML} = percentile exceedance probability for AML (95%) = 1.645

$$\text{AWL} = 37.5 \times \frac{\exp\left[(2.326 \times 0.555) - (0.5 \times 0.307)\right]}{\exp[(1.645 \times 0.407) - (0.5 \times 0.166)]}$$

AWL = 159 lb/day

Limits derived from TBELs:

AML = 45 mg/L × 0.0104 mgd × 8.34 = 3.9 lb/day

AWL = 65 mg/L × 0.0104 mgd × 8.34 = 5.6 lb/day

Table 9. Comparison of TSS TBELs and WQBELs

Parameter	Average Monthly Limit (lb/day)	Average Weekly Limit (lb/day)
TBEL	2.6	3.9
WQBEL	67.4	159
Most Stringent	2.6	3.9

1.1.13.4 Temperature

Santa Creek is impaired for temperature. A St. Joe Subbasin Temperature TMDL Addendum (DEQ 2011) did not allocate a temperature waste load to Emida WWTF, or other NPDES permits in the watershed (Santa-Fernwood and Clarkia). The following conclusion regarding temperature WLAs can be found on page 51 of the Addendum:

> Effluent temperatures should continue to be monitored under the NPDES permit. The data presented above lack the temporal resolution to make a clear determination if effluent is impacting aquatic life in the vicinity of the discharge. Future temperature monitoring should be conducted more frequently. The critical period to evaluate cold water aquatic life is from July 15 through August 15, the time period when most surface waters reach their highest temperatures of the year (Grafe et al. 2002). A complete data record would include effluent temperature recorded every hour to evaluate both the MDMT and MDAT (DEQ 2000). Once the facilities have conducted continuous temperature monitoring, DEQ will make a determination if there is a temperature impairment caused by the discharge. If temperature is found to exceed criteria for cold water aquatic life, temperature wasteload allocations will be adjusted in a subsequent TMDL for the point sources. Additional mixing zone analysis may also be warranted during permit reissuing to help determine impacts to the beneficial uses of the receiving water.

Assuming the Emida WWTF would have been included in the TMDL analysis if it had a current permit at the time of TMDL development, a similar conclusion would have likely been drawn.

For this reason, hourly temperature monitoring recommended in the excerpt above will be required of the permittee for a 12-month discharge period on effluent and upstream receiving water.

1.1.13.5 TRC

The Idaho WQS in Table 1 at IDAPA 58.01.02.210 establish an acute criterion of 19 µg/L and a chronic criterion of 11 µg/L for the protection of aquatic life. There are no effluent TRC data. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection on a monthly average basis if a 0.500 mg/L chlorine residual is maintained after 15 minutes of contact time. Based on this, an average weekly concentration of less than 0.750 mg/L, equal to 1.5 times the expected monthly average value, would be expected. A reasonable potential calculation using the expected maximum weekly average concentration of 0.750 mg/L showed that the discharge from the facility would have the reasonable potential to cause or contribute to a violation of the water quality criteria for chlorine. The calculated WQBELs are:

Average Monthly Limit: 0.286 mg/L, and 0.025 lb/day

Maximum Daily Limit: 0.574 mg/L, and 0.050 lb/day

However, for antibacksliding reasons described in section 3.6.4 the permit contains a maximum daily limit of 0.500 mg/L, and 0.042 lb/day.

DEQ does not believe the effluent limits are immediately achievable because:

- The facility does not have a dechlorination process,
- The monthly average chlorine residual following 15 minutes of contact time is 0.500 mg/L and current contact time is unknown, and
- There are no effluent data.

Because the limits are not immediately achievable, DEQ authorizes a compliance schedule to meet the final TRC limits. The compliance schedule requires the permittee to meet an interim effluent limit until compliance with the final TRC effluent limit. A 0.5 mg/L average monthly limit for chlorine is derived from standard operating practices. A wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L TRC limit on a monthly average basis. In addition to average monthly limits (AMLs), IPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. For TRC, the AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for TRC of 0.75 mg/L.

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

Average Monthly Limit= 0.5 mg/L x 0.0104 mgd x 8.34 = 0.04 lb/day

Average Weekly Limit = 0.75 mg/L x 0.0104 mgd x 8.34 = 0.065 lb/day

1.1.13.6 Phosphorus, Total as P

Santa Creek is not listed as impaired for total phosphorus. At the time of permit development, DEQ did not have adequate information to determine whether the effluent has a reasonable potential to cause or contribute to a violation of the water quality standards. While total phosphorus has no numeric criteria, dischargers are required to meet narrative criteria in IDAPA 58.01.02.200. The permittee must monitor the final effluent and receiving water at the frequencies specified in Table 13 and Table 15. If reasonable potential exists, DEQ will use the information to determine any necessary effluent limits. Monitoring for total phosphorus supports the objectives of the Lake Management Plan, a comprehensive waterbody plan that is centered on managing nutrients in the Coeur d'Alene Basin in order to manage the release of metal contaminated sediments in Coeur d'Alene Lake.

Narrative Criteria

DEQ must incorporate the narrative criteria described in IDAPA 58.01.02.200 when it determines permit limits and conditions. Narrative WQC limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic attributes, or adversely affect human health.

The Idaho WQS 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 permit contains a narrative limitation prohibiting the discharge of such materials or any violation of narrative WQS.

Antidegradation

DEQ's antidegradation policy provides three levels of protection to water bodies in Idaho subject to Clean Water Act (CWA) jurisdiction (IDAPA 58.01.02.051).

- Tier I of antidegradation protection is designed to ensure that existing uses and the water quality necessary to protect those uses is maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). A Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II protection applies to any water bodies considered to be high quality waters (where the water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water) and provides that water quality will be maintained and protected unless allowing for lower water quality is deemed by the state as necessary to accommodate important economic or social development in the area. In allowing any lowering of water quality DEQ must ensure adequate water quality to protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III protection applies to water bodies that have been designated by the Idaho Legislature as outstanding national resource waters and provides that water quality is to be maintained and protected (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ employs 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).

According to *Idaho's 2016 Integrated Report (*DEQ 2016), this AU is not fully supporting one or more of its assessed uses. The aquatic life use is not fully supported. Causes of impairment include temperature and sedimentation/siltation. As such, DEQ will provide Tier I protection (IDAPA 58.01.02.051.01) for the aquatic life use. The contact recreation beneficial use is unassessed. DEQ must provide an appropriate level of protection for the contact recreation use using information available at this time (IDAPA 58.01.02.052.05.b). Two *E. coli* samples were collected by DEQ staff in 2017 upstream of Emida, near where Santa Creek crosses Highway 6. The first sample taken on June 12, 2017 had an *E. coli* concentration of 370 /100mL. The second sample taken on June 13, 2017 had a total coliform concentration of 1,300 MPN/100mL. The lowest ratio of *E. coli* to fecal coliform density found in a 2003 USGS study of rivers in Kansas (Water-Resources Investigations Report 03–4056) was 0.48. The lowest ratio will yield the highest density of fecal coliform from a sample with a known *E. coli* density. A single sample total coliform sample of 1,300/100mL would result in a conservative *E. coli* value 624/100mL. Therefore, the second sample concentration is higher than the primary contact recreation single sample maximum of 406/100mL. As stated in IDAPA 58.01.02.251.01.b the high *E. coli* concentration does not indicate a WQS violation, however, "a water sample exceeding the *E. coli* single sample maximums below indicates likely exceedance of the geometric mean criterion..." For the sole purpose of this antidegradation analysis the recreation use will be considered impaired, and will be given Tier I protection. *E. coli* monitoring has been added to the upstream receiving water monitoring to confirm this in future permits.

1.1.14 Protection and Maintenance of Existing Uses (Tier I Protection)

A Tier I review is performed for all new or reissued permits applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain 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.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality-limited, and a 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 limits 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 *St. Joe River Subbasin Assessment and Total Maximum Daily Loads* (DEQ 2003), *St. Maries River Subbasin Assessment and Total Maximum Daily Loads* (DEQ 2003b)

and the St. Joe River Subbasin Temperature Total Maximum Daily Loads Addendum (DEQ 2011) establishes WLAs for TSS and temperature. The effluent limits and associated requirements contained in the 2020 permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the St. Maries TMDL. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in Santa Creek in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

Antibacksliding

Section 402(o) of the CWA and regulations at IDAPA 58.01.25.200 generally prohibit the renewal, reissuance, or modification of an existing IPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the existing permit (i.e., antibacksliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to section 4.1 of the Effluent Limit Development Guidance (DEQ 2017).

DEQ compared the effluent limits in the 1988 permit with the 2020 in Table 10 below.

Table 10. Comparison of 1988 and 2020 effluent limits.

Pollutant	Units	1988 Permit			2020 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 1988 and 2020 permit								
BOD_5	mg/L	45	65	—	30	45	—	MS
	lb/day	7	11	—	2.6	3.9	—	
	% removal	65	—	—	85	—	—	
TSS	mg/L	70	105	—	30	45	—	MS
	lb/day	—	—	—	2.6	3.9	—	
	% removal	—	—	—	85	—	—	
pH	s.u.	6.5–9.0 all times			6.5–9.0 all times			NC
E. coli	no./100 mL	—	—	—	126	—	—	MS
Fecal coliform[b] Oct 16 – April 30	no./100 mL	100	200	—	—	—	—	
Fecal coliform[b] May 1 – May 31	no./100 mL	50	100	—	—	—	—	
Total Residual Chlorine	mg/L	—	—	0.50	0.286	—	0.500	MS[c]
	lb/day	—	—	—	0.025	—	0.042	
Pollutants with no limits in both the 1988 and 2020 permit								
Ammonia, Total as N	mg/L	—	—	—	Report	—	Report	NC
Phosphorus, Total as P	mg/L	—	—	—	Report	—	—	NC
Temperature	°C	—	—	—	Report	—	Report	NC

[a] MS = More stringent pollutant load or concentration limit, LS = Less stringent pollutant load or concentration limit, NC = No change in pollutant load or concentration limit
[b] DEQ is replacing the fecal coliform limits with *E. coli* effluent limits. See discussion in section 3.6.3.
[c] See discussion in section 3.6.4.

1.1.15 BOD_5

The 1988 permit limits for BOD_5 consisted of equivalent to secondary treatment standards for concentration and percent removal. The monthly load limit was derived based on 65% removal of the design average influent load (i.e., 21 lb/day influent BOD_5 × (1-0.65) = 7 lb/day). The weekly load limit was calculated as 1.5 times the monthly limit, consistent with the proportion between the monthly average and weekly average concentrations.

The updated load limits are calculated using secondary treatment standards and the methods recommended by the ELDG (see section 3.2.1 for calculations) using the design flow and the concentration limits. As a result the 2020 load limits are more stringent than the previous permit.

1.1.16 TSS

The 1988 permit includes a 70 mg/L AML and 105 mg/L AWL for TSS based on alternative state requirements (ASR) and no percent removal requirement. The ASR applies to facilities

eligible to adjusted levels and approved by EPA or in a contiguous geographical area that cannot achieve TES. Idaho is not authorized to use ASRs, therefore, the permit contains concentration, load, and percent removal limits consistent with secondary treatment standards (30 mg/L AML and 45 mg/L AWL).

1.1.17 *E. coli*/Fecal coliform

DEQ is replacing fecal coliform limits with *E. coli* limits. In 1986 EPA updated its criteria to protect recreational use of water recommending an *E. coli* criterion as a better indicator of bacteria levels that may cause gastrointestinal distress in swimmers than fecal coliform. In 2000 DEQ changed its WQS criterion from fecal coliform to *E. coli*. The fecal coliform limits were in the previous permit because fecal coliform was the WQS at the time the permit was issued. The Idaho WQS 2002 revision changed the bacteria criterion from fecal coliform to *E. coli*. The *E. coli* limits are equal, or more, protective of water quality than the old fecal coliform limits, therefore no backsliding exists.

1.1.18 TRC

The previous chlorine limit was 0.5 mg/L as a daily maximum limit. The fact sheet from the 1988 permit described reasoning for the limit in the text below:

> A chlorine residual limit has been included to protect this reach of Santa Creek from chlorine toxicity. Allowing for rapid dissipation of chlorine in the receiving water, a residual chlorine limit of 0.5 mg/L daily maximum should meet the state's instream water quality criteria of 0.002 mg/L chlorine residual.

An RPA was conducted to calculate TRC limits using methods described in the ELDG (see Table 19). Using these methods an AML of 0.29 mg/L and MDL of 0.57 mg/L was calculated. The maximum daily limit of 0.57 mg/L is greater than the previous permit's limit. Even though the 2020 permit is a new (as opposed to reissued) permit, no significant changes or upgrades have been made since the 1988 issuance and there is no documentation of permit termination. Without any effluent data, using the previous permit limit of 0.5 mg/L is more conservative, and the facility will be issued a compliance schedule for TRC, giving the facility more time, and opportunities for upgrades, in order to meet this limit (see section 5.1).

In summary, the AML in the 2020 permit is more stringent than the previous permit, and the maximum daily limit remains the same, consistent with Idaho antibacksliding policies.

1.1.19 Temperature

Santa Creek is impaired for temperature; however no TMDL WLA is associated with the Emida WWTF. The previous permit did not have a limit or monitoring required for temperature. The 2020 permit will require the permittee to monitor effluent for temperature to assess the facility's impact on the temperature impairment of Santa Creek.

1.1.20 Ammonia and Phosphorus

The previous permit did not have a limit or monitoring required for ammonia or phosphorus. The 2020 permit will require the permittee to monitor effluent and receiving water to perform an RPA on the quality of the discharge in the next permit cycle.

Monitoring Requirements

Idaho regulations IDAPA 58.01.02 and 58.01.25 require that monitoring be included in permits to determine compliance with effluent limits and other permit restrictions. Monitoring may also be required to gather data to assess the need for future effluent limits or to monitor effluent impacts on receiving water quality. Permittees are responsible for conducting the monitoring and reporting the results on monthly DMRs and in annual reports.

Influent Monitoring

Influent monitoring requirements are listed in Table 11. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

Table 11. Influent monitoring requirements.

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow	10/16 to 5/31	mgd	1/week	Recorded	Maximum Daily, Average Monthly	Monthly (January, February, March, April, May, October, November, December)
BOD_5	10/16 to 5/31	mg/L	2/month	Grab[a]	Average Monthly	Monthly (January, February, March, April, May, October, November, December)
TSS	10/16 to 5/31	mg/L	2/month	Grab[a]	Average Monthly	Monthly (January, February, March, April, May, October, November, December)

a. Grab means an individual sample collected over a 15 minute period or less.

1.1.21 Influent Monitoring Changes from the 1988 Permit

Monitoring changes are presented in Table 12.

Table 12. Changes in Influent monitoring frequency from 1988 permit.

Parameter	1988 Permit	2020 Permit	Rationale
Flow	5/week	1/week	Changed to match effluent monitoring frequency
BOD_5	1/month	2/month	Reflects effluent monitoring frequency, necessary to calculate monthly average
TSS	—	2/month	Reflects effluent monitoring frequency, necessary to calculate percent removal rates

Additional Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's

performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

Table 13 presents the effluent monitoring requirements in the permit, including pollutants that must be monitored but do not have effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR. Monitoring for addition effluent parameters must occur between October 16 and May 31.

Table 13. Additional Effluent Monitoring

Parameter	Units	Minimum Frequency	Sample Type	Report	Reporting Period (DMR Months)
Parameters with effluent limits					
BOD_5	mg/L	2/month	Grab[e]	Average Monthly, Average Weekly, % Removal	Monthly (January, February, March, April, May, October, November, December)
	lb/day	2/month	Calculated[a]		
	% Removal	1/month	Calculated[b]		
TSS	mg/L	2/month	Grab[e]	Average Monthly, Average Weekly, % Removal	Monthly (January, February, March, April, May, October, November, December)
	lb/day	2/month	Calculated[a]		
	% Removal	1/month	Calculated[b]		
pH	s.u.	2/week	Grab[e]	Instantaneous Maximum, Instantaneous Minimum	Monthly (January, February, March, April, May, October, November, December)
E. coli	#/100 mL	5/month[c, d]	Grab[e]	Geometric Mean	Monthly (January, February, March, April, May, October, November, December)
TRC [d, f]	mg/L	1/week	Grab[e]	Average Monthly, Maximum Daily	Monthly (January, February, March, April, May, October, November, December)
Parameters without effluent limits					
Flow	mgd	1/week	Recorded	Average Monthly, Daily Maximum	Monthly (January, February, March, April, May, October, November, December)
Ammonia, Total as N	mg/L	1/month	Grab[e]	Average Monthly, Maximum Daily	Monthly (January, February, March, April, May, October, November, December)
Phosphorus, Total as P	mg/L	1/month	Grab[e]	Average Monthly	Monthly (January, February, March, April, May, October, November, December)
Temperature	°C	1/week	Grab[e]	Average Monthly, Maximum Daily	Monthly (January, February, March, April, May, October, November, December)
Temperature	°C	Continuous[g, h, i]	Recorded[j]	Instantaneous Maximum, Maximum Daily Average	Monthly (January, February, March, April, May, October, November, December)
E. coli	#/100 mL	5/month[c]	Grab[e]	Instantaneous Maximum	Monthly[d] (January, February, March, April, May, October, November, December)

a. Loading rates (lb/day) are calculated by multiplying the effluent concentration (mg/L) by the effluent flow (mgd) for the day of sampling and a conversion factor (8.34). For more information see Equation 1 in the ELDG.
b. Percent Removal = (average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration x 100. Influent and effluent samples must be taken over approximately the same time period.
c. This frequency complies with State of Idaho Water Quality Standards for *E. coli* (e.g. minimum of 5 samples taken every 3 to 7 days over a 30-day period).
d. Exceedance of a maximum daily limit, instantaneous maximum limit, or instantaneous minimum limit requires 24-hour reporting in accordance with 2.2.7. For *E. coli*, the maximum daily threshold that triggers 24-hour reporting is 406/100 mL. Please see 2.2.7 for additional 24-hour reporting requirements.
e. A grab sample is an individual sample collected over a 15-minute period or less.
f. TRC has a compliance schedule, see Section 5.1.

g. Continuous temperature monitoring is only required from 10/16/2023 to 05/31/2024 of the permit cycle, when discharging.
h. Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 60 minutes.
i. DEQ acknowledges that uninterrupted data collection is not guaranteed due to vandalism, theft, damage, disturbance, power interruption, etc. In the event of equipment failure or loss, the permittee must notify DEQ and deploy new equipment to minimize interruption of data collection. If new equipment cannot be immediately deployed, the permittee must monitor grab measurements daily between 8 a.m. and 5 p.m. or describe frequency when continuous monitoring is not possible until continuous monitoring equipment is redeployed.
j. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at one-hour or more frequent intervals. DEQ's Protocol for Placement and Retrieval of Temperature Data Loggers contains protocols for continuous temperature sampling. This document is available online at: http://www.deq.idaho.gov/media/487602-wq_monitoring_protocols_report10.pdf. Report the following temperature monitoring data on the DMR: instantaneous maximum, maximum daily average.

1.1.22 Effluent Monitoring Changes from the 1988 Permit

Monitoring parameters and frequency have been changed relative to the 1988 permit. Changes in monitoring are presented in Table 14, below.

Table 14. Changes in effluent monitoring frequency from 1988 permit.

Parameter	1988 Permit	2020 Permit	Rationale
BOD_5	1/month	2/month	More frequent monitoring allows compliance determination for monthly, weekly, and daily effluent limits
TSS	1/month	2/month	
pH	1/week	2/week	More frequent monitoring provides data supporting more accurate compliance assessment
TRC	5/week	1/week	Facility will be required to update the chlorination and dechlorination treatment processes
Ammonia, Total as N	—	1/month	RPTE is unknown
Phosphorus, Total as P	—	1/month	Monitoring for total phosphorus supports the objectives of the Lake Management Plan, a comprehensive waterbody plan that is centered on managing nutrients in the Coeur d'Alene Basin in order to manage the release of metal contaminated sediments in Coeur d'Alene Lake
Temperature	—	Continuous	Data collection to determine effluent impact on the temperature impairment in Santa Creek

Receiving Water Monitoring

Receiving water monitoring is required to confirm the appropriateness of the mixing zones granted and to prepare for pollutants that will undergo RPA during the next permit cycle. 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 15 presents the receiving water monitoring requirements for the permit. The Emida WWTF should establish receiving water monitoring at DEQ approved locations. Receiving water monitoring results must be submitted with the DMR.

Table 15. Upstream receiving water monitoring requirements for Santa Creek.

Parameter	Monitoring Period	Units	Monthly Average	Monthly Geometric Mean	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Maximum Daily Average	Sample Frequency[a, b]	Sample Type	Reporting Period (DMR Months)
Temperature	10/16-05/31	°C	Report	—	—	Report	—	Report	4x/year (March, May, October, December)	Grab	4x/year (March, May, October, December)
Temperature[c]	10/16/2023 to 05/31/2024	°C	Report	—	—	Report	—	Report	Continuous[e,f,g,h]	Recorded	—
pH[d]	10/16-05/31	s.u.	—	—	Report	Report	—	—	4x/year (March, May, October, December)	Grab	4x/year (March, May, October, December)
Ammonia, Total as N	10/16-05/31	mg/L	Report	—	—	—	Report	—	4x/year (March, May, October, December)	Grab	4x/year (March, May, October, December)
Phosphorus, Total as P	10/16-05/31	mg/L	Report	—	—	—	—	—	4x/year (March, May, October, December)	Grab	4x/year (March, May, October, December)
E. coli	05/01 to 05/31 and 10/01 to 10/31	#/100mL	—	Report	—	Report	—	—	5/month	Grab	2x/year (May, October)

a. Monitoring frequency of 4x/year during the warmest part of the day. Samples must be taken even if the permittee is not discharging.
b. To the extent practicable, surface water collection shall occur on the same day as effluent sample collection.
c. Continuous temperature monitoring is only required for one year of the permit cycle, contemporaneous with effluent temperature monitoring. Continuous temperature results must be submitted during permit reapplication, as described in Permit Section 2.1.4, number 8.
d. pH must be analyzed within 15 minutes of sample collection.
e. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at one-hour or more frequent intervals. DEQ's Protocol for Placement and Retrieval of Temperature Data Loggers contains protocols for continuous temperature sampling. This document is available online at:

   http://www.deq.idaho.gov/media/487602-wq_monitoring_protocols_report10.pdf. Report the following temperature monitoring data on the DMR: instantaneous maximum and maximum daily average.

f. Use the temperature device manufacturer's software to generate (export) an Excel or electronic ASCII text file. The file must be submitted annually to IDEQ by January 31 for the previous monitoring year along with the placement log. The placement logs must include the following information for both deployment and retrieval: date, time, temperature device manufacturer ID, location, depth, whether it measured air or water temperature, and any other details that may explain data anomalies.
g. Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 60 minutes.

h. DEQ acknowledges that uninterrupted data collection is not guaranteed due to vandalism, theft, damage, disturbance, power interruption, etc. In the event of equipment failure or loss, the permittee must notify DEQ and deploy new equipment to minimize interruption of data collection. If new equipment cannot be immediately deployed, the permittee must monitor grab measurements daily between 8 a.m. and 5 p.m. or describe frequency when continuous monitoring is not possible until continuous monitoring equipment is redeployed.

1.1.23 Receiving Water Monitoring Changes from the 1988 Permit

Monitoring parameters and sampling frequency have been changed relative to the 1988 permit. Changes in monitoring are presented in Table 16, below.

Table 16. Changes in Santa Creek monitoring frequency from 1988 permit.

Parameter	1988 Permit	2020 Permit	Rationale
Temperature	—	Continuous	Data collection to determine effluent impact on the temperature impairment in Santa Creek
pH	—	1/quarter	Data will be used to evaluate reasonable potential for ammonia toxicity
Ammonia, Total as N	—	1/quarter	
TRC	—	1/quarter	
Phosphorus, Total as P	—	1/quarter	Monitoring for total phosphorus supports the objectives of the Lake Management Plan, a comprehensive waterbody plan that is centered on managing nutrients in the Coeur d'Alene Basin in order to manage the release of metal contaminated sediments in Coeur d'Alene Lake

Permit Renewal Monitoring

The permit renewal monitoring requires data collected to characterize the effect of the effluent on the Santa Creek. At a minimum, three samples of the final wastewater effluent for the parameters listed in Table 17 are required so that DEQ can assess the surface water impacts.

DEQ has the discretion to waive a permit renewal requirement if DEQ has access to substantially identical information (IDAPA 58.01.25.105.11.b). The WWTF effluent samples from lagoons has a greater than 24-hours holding time, and is substantially identical to a 24-hour composite. The 24-hour composite requirement for this facility is waived.

Table 17. Effluent monitoring required for all permit renewals.

Parameter	Units	Sample Type	Report
pH	s.u.	Grab	Minimum and maximum value
Flow	mgd	Recorded	Maximum daily value, average daily value, number of samples
Temperature	°C	Grab	
BOD_5	mg/L	Grab	Maximum daily value, average daily value, analytical method and ML or MDL
TSS	mg/L	Grab	
E. coli	#/100 mL	Grab	

The permittee must conduct one sample of parameters listed in Table 8 in the final effluent from three separate seasonal periods. Seasonal periods for this permit are defined as: January 1- March 15; March 16-May 31; October 16-December 31.

In addition, the permittee must continue permit renewal effluent monitoring at a frequency of once every three years after the renewal application due date listed above until a new permit is issued.

Special Conditions

Compliance Schedule

IDAPA 58.01.25.305 and 40 CFR 122.47 allow for compliance schedules in IPDES permits to provide additional time for permittees to achieve compliance.

The permit includes a compliance schedule for TRC. Compliance schedules are authorized in Idaho Rules at IDAPA 58.01.25.305 and IDAPA 58.01.02.400.03. Compliance schedules allow a discharger to phase in, over time, compliance with water quality-based effluent limitations when limitations are in the permit for the first time. DEQ has found that a compliance schedule including interim effluent limits is appropriate for TRC because the facility cannot immediately comply with the new water-quality based effluent on the effective date of the permit.

Nondomestic Waste Management

The permittee has nonsignificant, nondomestic (industrial/commercial) users, which are neither subject to the pretreatment standards in 40 CFR 405 through 471, nor meet any of the criteria of a significant industrial user (SIU) as specified in 40 CFR 403.3(v), and therefore, DEQ does not require an authorized pretreatment program. The permittee must ensure that pollutants from nondomestic waste discharged to their system do not negatively impact system operation or pass through the wastewater treatment facility. The permittee must not authorize indirect discharges of pollutants that would inhibit, interfere with, or otherwise be incompatible with operation of the wastewater treatment works, including interference with the use or disposal of municipal sludge.

Spill Control Plan

The permittee shall develop and implement a plan for chlorine and other chemicals used and stored on site.

Standard Conditions

Section 4 of the permit contains standard regulatory language that must be included in all IPDES permits. DEQ bases the Standard Conditions on state and federal law and regulations. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

1.1.24 Quality Assurance Project Plan

In accordance with IDAPA 58.01.25.300.05, the permittee is required to develop procedures to ensure that the monitoring data submitted is accurate and explain data anomalies if they occur. The permittee is required to develop, maintain, and implement a plan. The quality assurance project plan (QAPP) shall consist of standard operating procedures for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained on site and made available to DEQ upon request.

1.1.25 Operation and Maintenance Manual

The permit requires Emida WWTF to properly operate and maintain all facilities and systems of conveyance, 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. The plan must be retained on site and made available to DEQ upon request.

1.1.26 Emergency Response Plan

The permittee must develop and implement an emergency response plan that identifies measures to protect public health and the environment. At a minimum, the plan must include mechanisms for the following:

1. Ensure that the permittee is aware (to the greatest extent possible) of all overflows from portions of the collection system over which the permittee has ownership or operational control as well as any unanticipated treatment unit bypass or upset that may exceed any effluent limit in the permit.
2. Ensure that reports of an overflow or of an unanticipated bypass or upset that may exceed any effluent limit in this permit are immediately dispatched to appropriate personnel for investigation and response.
3. Ensure immediate notification to DEQ of any noncompliance that may endanger public health or the environment and identify the public health district and other officials who will receive immediate notification for items that require 24-hour.
4. Ensure that appropriate personnel understand, are appropriately trained on, and follow the Emergency Response Plan; and
5. Provide emergency facility operation.

Compliance with other DEQ Rules

Operator's License

The permittee must meet the requirements and operator license levels listed in the wastewater rules at IDAPA 58.01.16.203 for the type(s) of operations at the facility.

Sludge/Biosolids

DEQ separates wastewater and sludge permitting for the purposes of regulating biosolids. DEQ 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 503 and the requirements of Idaho's Wastewater Rules (IDAPA 58.01.16.480 and 650). The 503 regulations are self-implementing, and facilities must comply with them whether or not a permit has been issued. Idaho's Wastewater Rules require a POTW to have the capability to process sludge accumulated on site in preparation for final disposal or reuse (IDAPA 58.01.16.480 and 58.01.16.650). Operations of sludge processing, storage, and disposal activities must comply with a prepared sludge management plan.

Permit Expiration or Modification

The permit will expire five years after the effective date.

DEQ may modify a permit before its expiration date only for causes specified in IDAPA58.01.25.201. A modification other than a minor modification requires preparing a draft permit that incorporates the proposed changes, preparing a fact sheet, and conducting a public review period. Only the permit conditions subject to the modification will be reopened when a permit is modified. All other conditions of the existing permit remain in effect. Modifying a permit does not change the expiration date of the original permit.

References for Text and Appendices

DHW-DOE. 1980. *Santa Creek Study – Benewah County.* Department of Health and Welfare Division of Environment Water Quality Summary No. 21. October 1980.

DEQ. 2003. *St. Joe River Subbasin Assessment and Total Maximum Daily Loads*. Boise, ID: DEQ. *http://www.deq.idaho.gov/media/452741-st_joe_entire.pdf*

DEQ. 2003b. *St. Maries River Subbasin Assessment and Total Maximum Daily Loads*. Boise, ID: DEQ. *http://www.deq.idaho.gov/media/452650-st_maries_entire.pdf*

DEQ. 2011. *St. Joe River Subbasin Temperature Total Maximum Daily Loads Addendum to the St. Joe River Subbasin Assessment and Total Maximum Daily Loads and St. Maries River Subbasin Assessment and Total Maximum Daily Loads.* Boise, ID: DEQ. *http://www.deq.idaho.gov/media/726477-st-joe-river-subbasin-temperature-tmdl-addendum-0911.pdf*

DEQ . 2016. *Idaho's 2016 Integrated Report*. Boise, ID: DEQ. *https://www.deq.idaho.gov/media/60182296/idaho-integrated-report-2016.pdf*

DEQ. 2016. *Public Participation in the Permitting Process* – Boise, ID. DEQ. *http://www.deq.idaho.gov/media/60178029/ipdes-public-participation-permitting-process-0216.pdf*

DEQ. 2017. *Effluent Limit Development Guidance*. Idaho Department of Environmental Quality. State Office. December 2017.

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

EPA. 1996**.** *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies.* Washington, DC: EPA Office of Water, Office of Enforcement and Compliance Assurance. Memorandum. *https://www3.epa.gov/npdes/pubs/perf-red.pdf*

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

EPA. 2015. *National Pollutant Discharge Elimination System (NPDES) Inspection Report – Emida Wastewater Facility, Emida, ID*. Office of Compliance and Enforcement, Inspection and Enforcement Management Unit. EPA Region 10. May 2015.

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

Appendix A. Facility Maps/Process Schematics

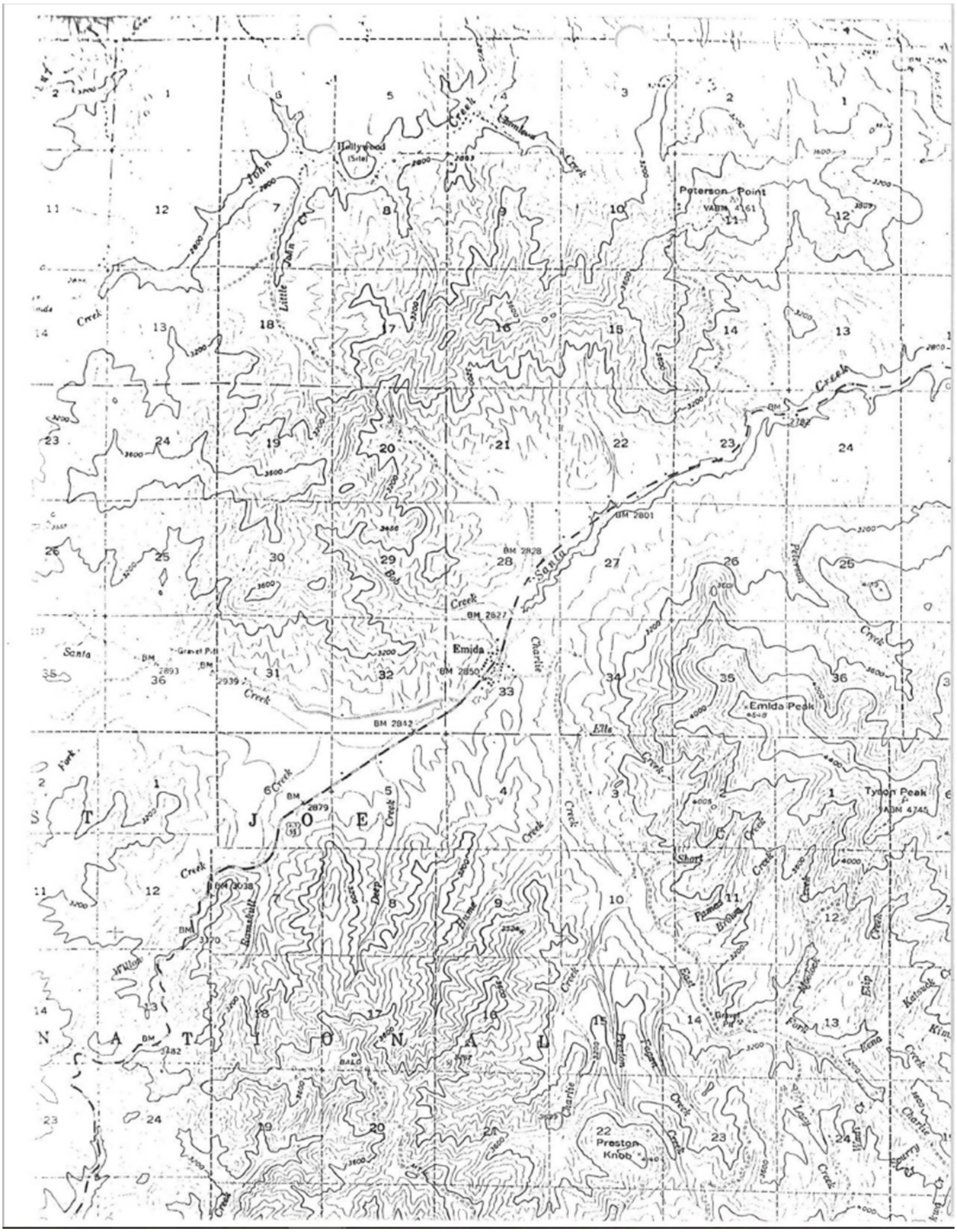


Figure 1: Topographic map of area surrounding the Emida Water and Sewer Association, Inc.

Figure 2: Aerial view of area surrounding the Emida Water and Sewer Association, Inc.

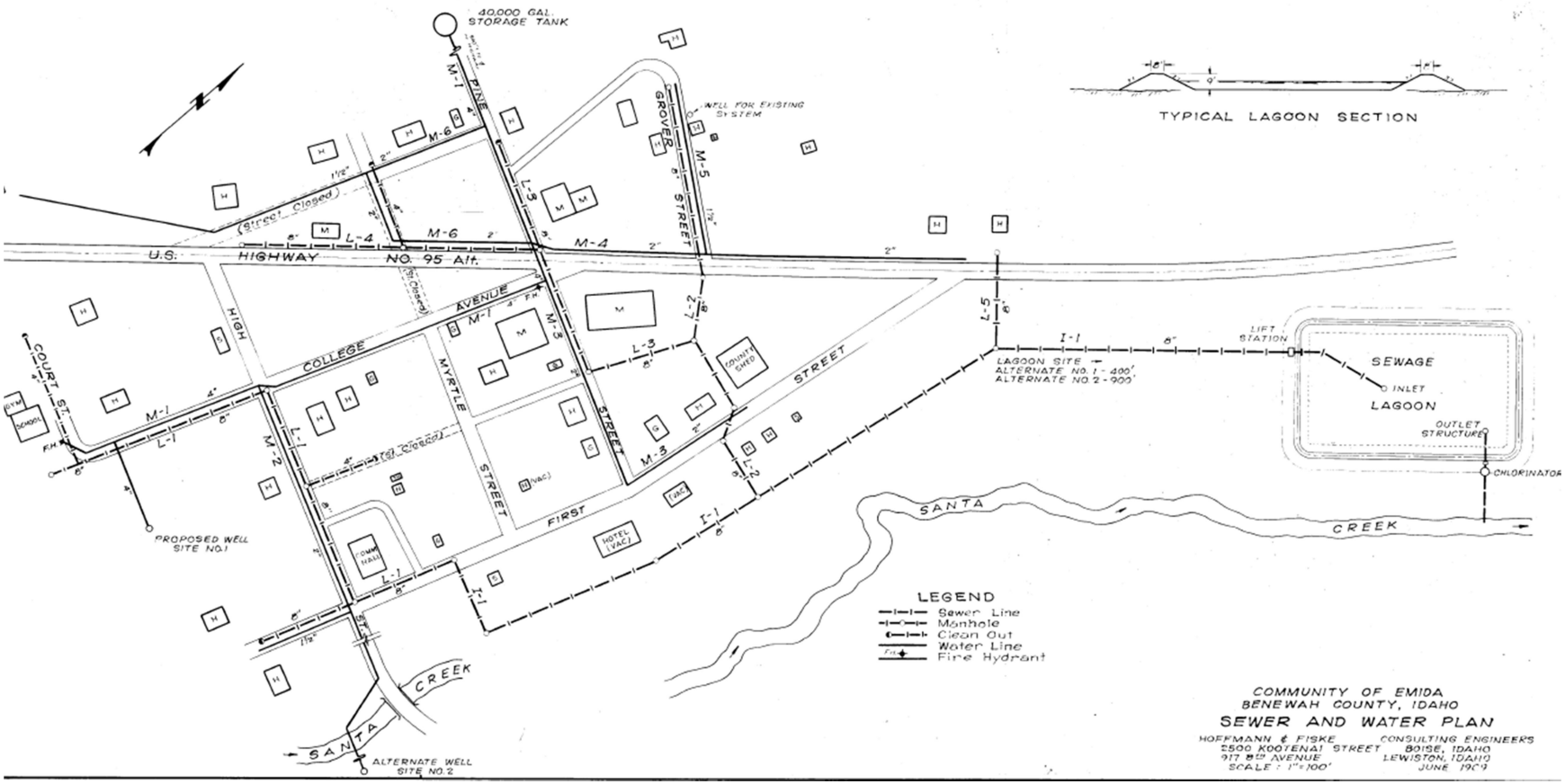


Figure 3: Design schematic plan view for Emida Water and Sewer Association, Inc. system.

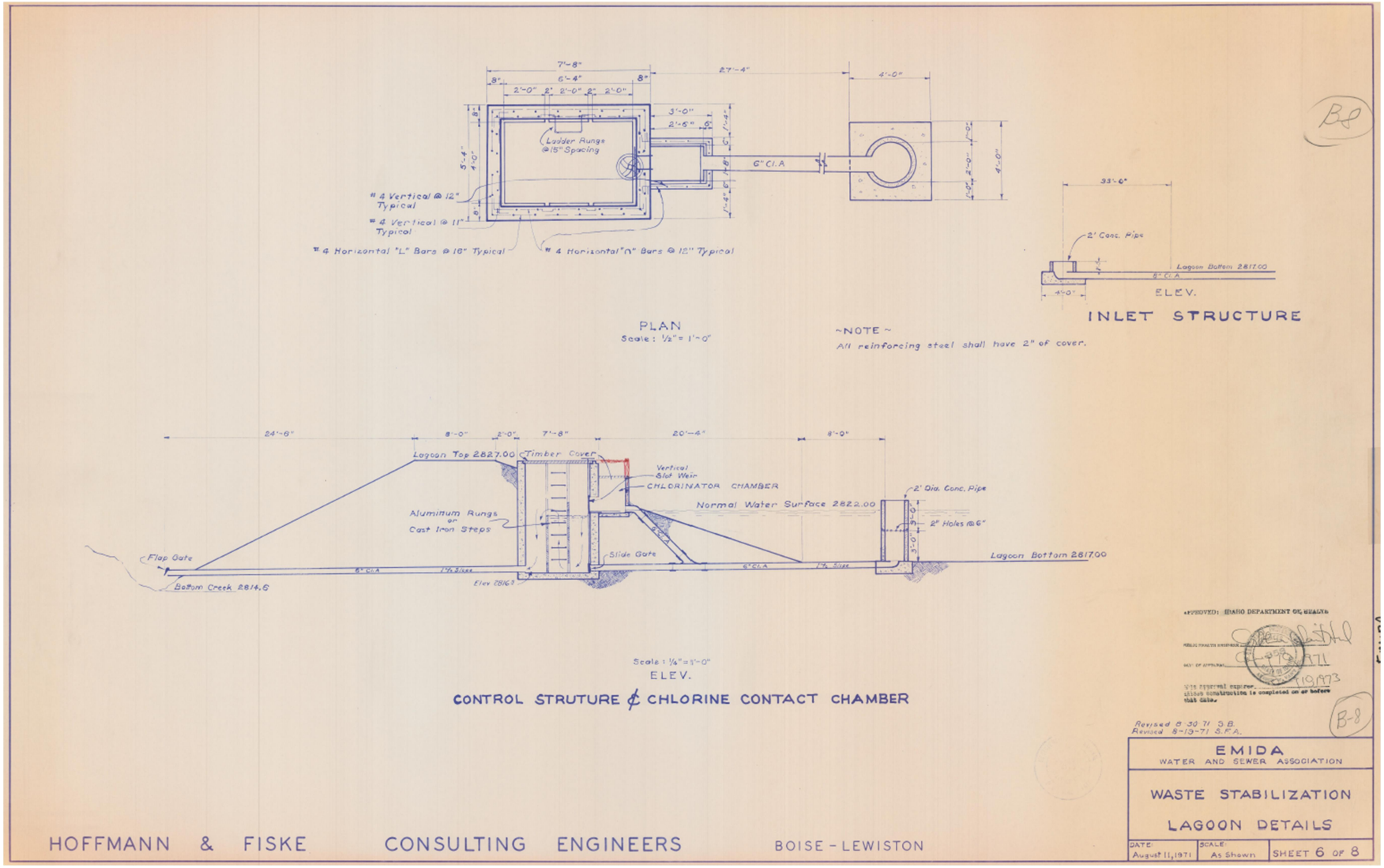


Figure 4: Design schematic for Emida Water and Sewer Association, Inc. chlorine contact chamber

Appendix B. Technical Calculations

The results of the technical calculations are discussed in sections 0 and 0 of this fact sheet.

A. Technology-Based Effluent Limits (TBELs)

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as secondary treatment, which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated secondary treatment effluent limits, which are found in 40 CFR 133. These TBELs apply to all municipal wastewater treatment facilities and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH.

The concentration, load, and removal rate limits for BOD_5 and TSS are the TBELs of 40 CFR 133.102. As explained in section 3.3.3, DEQ has determined that more stringent water quality based effluent limits (WQBELs) are necessary for the pH minimum limit in order to ensure compliance with WQS.

All other parameter limits for *E. coli* and TRC are based on WQBELs in order to ensure compliance with water quality standards. RPA was conducted for TRC and reasonable potential existed to prompt limit development using the Water Pollution Control Federation's *Chlorination of Wastewater* (1976) monthly average (500 µg/L) and weekly average (750 µg/l) disinfection standards. Equations used in this determination are given below.

B. Reasonable Potential and Water Quality-Based Effluent Limit Calculations

DEQ uses the process in the *Effluent Limit Development Guidance* (DEQ 2017) to determine reasonable potential. After characterizing the effluent and receiving water, DEQ compares the projected receiving water concentration after the effluent is discharged to the water quality criteria for the pollutant of concern. If the projected concentration exceeds the criterion, there is reasonable potential and an effluent limit is developed.

If DEQ chooses to authorize a mixing zone, the water quality criteria must still be met at the edge of the mixing zone. If after the analysis of the mixing zone, water quality critieria are not being met, the facility will receive an effluent limit that identifies both the size of the mixing zone and the final effluent limit.

Mass-Balance

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

$$C_d = \frac{(C_e Q_e) + \lfloor C_u (Q_u \times \%MZ) \rfloor}{Q_e + (Q_u \times \%MZ)}$$

Equation 1. Simple mass-balance equation.

Where:

C_d = downstream receiving water concentration	Calculated value
Q_e = critical effluent flow	From discharge flow data (design flow for POTW)
Q_u = critical upstream flow (1Q10 acute criterion, 7Q10 chronic, or harmonic mean)	From water quality standards
%MZ = percent of critical low flow provided by mixing zone	From mixing zone analysis
C_u = critical upstream pollutant concentration (90th to 95th percentile)	From receiving water data
C_e = critical effluent pollutant concentration	Calculated value using

A dilution factor (D) can be introduced to describe the allowable mixing. A dilution factor represents the ratio of the receiving water body low flow percentage (i.e., the low-flow design discharge conditions) to the effluent discharge volume and is expressed as:

$$Dilution\ Factor = D_f = \frac{(Q_S \times P + Q_e)}{Q_e} = \frac{(Q_s \times P)}{Q_e} + 1$$

Equation 2. Dilution factor calculation.

Where: D_f= Dilution factor

Qs = Receiving water low-flow condition (cfs)

P = Mixing zone percentage

Qe = Effluent discharge flow (cfs)

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

Critical Effluent Pollutant Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, DEQ's *Effluent Limit Development Guidance* (DEQ 2017) recommends using the critical effluent pollutant concentration (C_e) in the mass balance calculation (see Equation 1). To determine the C_e DEQ has adopted EPA's statistical approach that accounts for day-to-day variability in effluent quality by identifying the number of samples, calculating the coefficient of variation (CV) (Equation 7, below), and selecting a reasonable potential multiplying factor (RPMF) from the tables in the *Effluent Limit Development Guidance* (DEQ 2017).

$$CV = \frac{Standard\ Deviation}{Mean}$$ **Equation 3. CV calculation.**

$$C_e = MOEC\ x\ RPMF$$ **Equation 4. C_e calculation.**

If the C_e exceeds water quality criteria then a reasonable potential analysis is conducted.

RPA Calculations for Total Residual Chlorine

The calculations below are also shown in Table 19.

$$C_d = \frac{(C_e Q_e) + \lfloor C_u(Q_u \times \%MZ) \rfloor}{Q_e + (Q_u \times \%MZ)}$$

Where:

C_d = downstream receiving water concentration	= calculated
Q_e = critical effluent flow	= 0.016 cfs (0.0104 mgd design flow)
$Q_{u\text{-}acute}$ = critical upstream flow (1Q10)	= 1.88 cfs
$Q_{u\text{-}chronic}$ = critical upstream flow (7Q10)	= 2.37 cfs
%MZ = percent of critical low flow	25%
C_u = critical upstream concentration	= 0 µg/L
C_e = critical effluent pollutant concentration	= $MOEC \times RPMF$ = 2,263
MOEC = maximum observed effluent concentration	= 750 µg/L
RPMF = reasonable potential multiplying factor	=3.018 (see Table 19)

$$C_{d-acute} = \frac{\left(2{,}263\,\frac{\mu g}{L} \times 0.016 cfs\right) + \lfloor 0\mu g/L(1.88\ cfs \times 25\%) \rfloor}{0.016 cfs + (1.88 cfs \times 25\%)}$$

$$C_{d-acute} = \frac{(36.21) + \lfloor 0 \rfloor}{0.49}$$

$$C_{d-acute} = 74$$

Acute WQS for TRC is 19 µg/L. $C_{d\text{-}acute}$ > WQS therefore there is reasonable potential to cause or contribute to water quality impairments.

$$C_{d-chronic} = \frac{\left(2{,}263\,\frac{\mu g}{L} \times 0.016 cfs\right) + \lfloor 0\mu g/L(2.37\ cfs \times 20\%) \rfloor}{0.016\ cfs + (2.37 cfs \times 25\%)}$$

$$C_{d-chronic} = \frac{(36.21) + \lfloor 0 \rfloor}{0.61}$$

$$C_{d-chronic} = 59$$

Chronic WQS for TRC is 11 µg/L. $C_{d\text{-}chronic}$ > WQS therefore there is reasonable potential to cause or contribute to water quality impairments.

Reasonable Potential Analysis
The discharge has reasonable potential to cause or contribute to an exceedance of WQC, referred to as a reasonable potential to exceed (RPTE), if the critical concentration of the pollutant at the end of pipe exceeds the most stringent WQC for that pollutant. This RPTE may result in end-of-pipe limits or may be accommodated if the receiving water has sufficient low flows to provide a mixing zone and the POC does not have acute toxicity attributes. Other conditions may also be applicable that may restrict the use of a mixing zone for the POC.

C. WQBEL Calculations

The following calculations demonstrate how the WQBELs in the permit were calculated. The permit includes WQBELs for pH, *E. coli*, and TRC. The following discussion presents the general equations used to calculate the WQBELs.

Calculate the Wasteload Allocations (WLAs)
WLAs are calculated using the same mass-balance equations used to calculate the concentration of the pollutant at the mixing zone boundary in the RPA. WLAs must be calculated for both acute and chronic criteria. To calculate the WLAs, C_d is set equal to the appropriate criterion and the equation is solved for C_e. The calculated C_e is the WLA. Equation 9 is rearranged to solve for the WLA:

$$C_e = WLA_{(a\ or\ c)} = \frac{WQC_{(a\ or\ c)}[Q_e + (Q_u \times \%MZ)] - [C_u \times (Q_u \times \%MZ)]}{Q_e}$$

Equation 5. Simple mass-balance equation for calculating WLA for flowing water.

Where:

$WQC_{(a\ or\ c)}$ = Pollutant water quality criterion (acute or chronic)	Calculated value
Q_e = Critical effluent flow	From discharge flow data (design flow for POTW)
Q_u = Critical upstream flow (1Q10 acute criterion or 7Q10 chronic)	From water quality standards
%MZ = Percent of critical low flow provided by mixing zone	From mixing zone analysis
C_u = Critical upstream pollutant concentration (90th to 95th percentile)	From receiving water data
$C_e = WLA_{(a\ or\ c)}$ = wasteload allocation (acute or chronic)	Calculated from Equation 4

Idaho's WQC for some metals are expressed as the dissolved fraction. The rules regulating the IPDES program (IDAPA 58.01.25.303.03) require that effluent limits be expressed as total recoverable metal unless standards have been promulgated allowing limits specified in dissolved, valent, or total forms. A case-by-case basis has been established for limits specified in dissolved, valent, or total form, or all approved analytical methods for the metal inherently measure only its dissolved form. Therefore, the permit writer should calculate a WLA 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 discussed in *Guidance Document on Dynamic Modeling and Translators* (EPA 1993), the criteria translator (CT) is equal to the conversion factor when site-specific translators are not available. Conversion factors for metals criteria are listed in DEQ's Water Quality Standards (WQS) at IDAPA 58.01.02.210.02. The WQS also lists several guidance documents at IDAPA 58.01.02.210.04 that are recommended for the development of site specific translators.

The next step is to compute the acute and chronic long-term average ($LTA_{(a \text{ or } c)}$) concentrations, which will be derived from the acute and chronic WLAs. This is done using the following equations from the *Effluent Limit Development Guidance* (DEQ 2017):

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z_{99}\sigma)}$$ **Equation 6. Acute LTA for toxics.**

Where:

LTA_a = Acute long-term average	Calculated value
WLA_a = Acute wasteload allocation	Calculated value. See Equation 5.
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log
CV = Coefficient of variation	Calculated using field data. If 10 or less samples available, use default value of 0.6. See Equation 3
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$LTA_c = WLA_c \times e^{(0.5\sigma_n^2 - z_{99}\sigma_n)}$$ **Equation 7. Chronic LTA average for toxics.**

Where:

LTA_c = Chronic long-term average	Calculated value
WLA_c = Chronic wasteload allocation	Calculated value. See Equation 5.
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	
$\sigma_n^2 = Ln[(CV^2)/n + 1)]$	Ln is the natural log
CV = Coefficient of variation	Calculated using field data. If 10 or less, samples available use default value of 0.6. See Equation 3.
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
n = Averaging period for the chronic water quality criterion (typically 4 days)	Varies

The acute and chronic LTAs are compared, and the more stringent of the two is used to calculate the maximum daily and average monthly limits.

Derive the Maximum Daily and Average Monthly Effluent Limits

Using the *Effluent Limit Development Guidance* (DEQ 2017) equations, the maximum daily limit (MDL) and average monthly limit (AML) are calculated as follows:

$$Maximum\ Daily\ Limit = LTA_m \times e^{(z_{99}\sigma - 0.5\sigma^2)}$$ **Equation 8. Maximum daily limit for toxics.**

Where:

LTA_m = Minimum long-term average value	Lesser value calculated from Equation 6 and Equation 7
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log of base e
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
CV = Coefficient of variation	See Equation 3.

$$AML = LTA_m \times e^{(z_{95}\sigma_n - 0.5\sigma_n^2)}$$ **Equation 9. Average monthly limit for toxics.**

Where:

LTA_m = Minimum long-term average	Lesser value calculated from Equation 6 and Equation 7
AML = Average monthly limit	Calculated value
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	
$\sigma_n^2 = Ln[(CV^2)/n + 1]$	Ln is the natural log of base e
Z_{95} = z score of the 95th percentile of the normal distribution	1.645
n = Number of sample specified in the permit to be analyzed each month	Typically n = 1, 2, 4, 10, or 30.
CV = Coefficient of variation	See Equation 3

Example RPA Calculations with RPTE –TRC

The first step in calculating effluent limits, the wasteload allocation (WLA) of both acute and chronic are calculated.

$$WLA_{(a\ or\ c)} = \frac{WQC_{(a\ or\ c)}[Q_e + (Q_u \times \%MZ)] - [C_u \times (Q_u \times \%MZ)]}{Q_e}$$

Where:

C_d = downstream receiving water concentration	= calculated
Q_e = critical effluent flow	= 0.016 cfs (0.0104 mgd design flow)
$Q_{u\text{-}acute}$ = critical upstream flow (1Q10)	= 1.88 cfs
$Q_{u\text{-}chronic}$ = critical upstream flow (30Q5)	= 2.37 cfs
%MZ = percent of critical low flow	Acute 25%, Chronic 25%
C_u = critical upstream concentration	= 0 µg/L
C_e = critical effluent pollutant concentration	= $MOEC \times RPMF$ = 2,263 µg/L
MOEC = maximum observed effluent concentration	= 750 µg/L
RPMF = reasonable potential multiplying factor	=3.018 (see Table 19)
$C_{d\ (a)}$	=74 µg/L
$C_{d\ (c)}$	=59 µg/L
$WQC_{(a)}$	=19 µg/L
$WQC_{(c)}$	=11 µg/L

$$WLA_{(a)} = \frac{WQC_{(a)}[Q_e + (Q_u \times \%MZ)] - [C_u \times (Q_u \times \%MZ)]}{Q_e}$$

$$WLA_{(a)} = \frac{19\ \mu g/L[0.016cfs + (1.88cfs \times 25\%)] - [0\mu g/L \times (1.88cfs \times 25\%)]}{0.016cfs}$$

$$WLA_{(a)} = \frac{9.23 - [0]}{0.016}$$

$$WLA_{(a)} = 574\ \mu g/L$$

$$WLA_{(c)} = \frac{WQC_{(c)}[Q_e + (Q_u \times \%MZ)] - [C_u \times (Q_u \times \%MZ)]}{Q_e}$$

$$WLA_{(c)} = \frac{11\ \mu g/L[0.016cfs + (2.37cfs \times 25\%)] - [0 \times (2.37cfs \times 25\%)]}{0.016cfs}$$

$$WLA_{(c)} = \frac{6.7 - [0]}{0.016}$$

$$WLA_{(c)} = 416\ \mu g/L$$

A long term average (LTA) is calculated using the values in the step above.

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z_{99}\sigma)}$$

Where:

LTA_a = Acute long-term average	Calculated value
WLA_a = Acute wasteload allocation	=574 ug/L
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	=0.555
σ^2 = Ln(CV^2+1)	=0.307
CV = Coefficient of variation	Assumed 0.6
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$LTA_a = 574\ \mu g/L \times 2.718^{(0.5*0.307 - 2.326*0.555)}$$

$$LTA_a = 184\ \mu g/L$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_n^2 - z_{99}\sigma_n)}$$

Where:

LTA_c = Chronic long-term average	Calculated value
WLA_c = Chronic wasteload allocation	=416 ug/L
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	=0.294
σ_n^2 = Ln[(CV^2)/n + 1)]	=0.086
CV = Coefficient of variation	=1.233
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
n = Averaging period for the chronic water quality criterion (typically 4 days)	30

$$LTA_c = 416\ \mu g/L \times 2.718^{(0.5*0.086 - .326*0.294)}$$

$$LTA_c = 219\ \mu g/L$$

The acute long term average is more limiting and will be used for effluent limit calculations.

$$Maximum\ Daily\ Limit = LTA_m \times e^{(z_{99}\sigma - 0.5\sigma^2)}$$

Where:

LTA_m = Minimum long-term average value	=184 ug/L
σ = Square root of σ^2	=0.555
σ^2 = Ln(CV^2+1)	=0.307
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$Maximum\ Daily\ Limit = 184\ \text{ug/L} \times e^{(2.326*0.555 - .5*0.307)}$$

$$Maximum\ Daily\ Limit = 574\ \mu\ \text{g/L}$$

Maximum Daily Limit = 0.574 mg/L × 0.0104 mgd × 8.34 = 0.050 lb/day

$$AML = LTA_m \times e^{(z_{95}\sigma_n - 0.5\sigma_n^2)}$$

Where:

LTA_m = Minimum long-term average	=184 ug/L
AML = Average monthly limit	Calculated value
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	=0.294
σ_n^2 = Ln[(CV^2)/n + 1]	=0.086
Z_{95} = z score of the 95th percentile of the normal distribution	1.645
n = Number of sample specified in the permit to be analyzed each month	= 4

$$AML = 184\ \text{ug/L} \times e^{(1.645*0.294 - .5*0.086)}$$

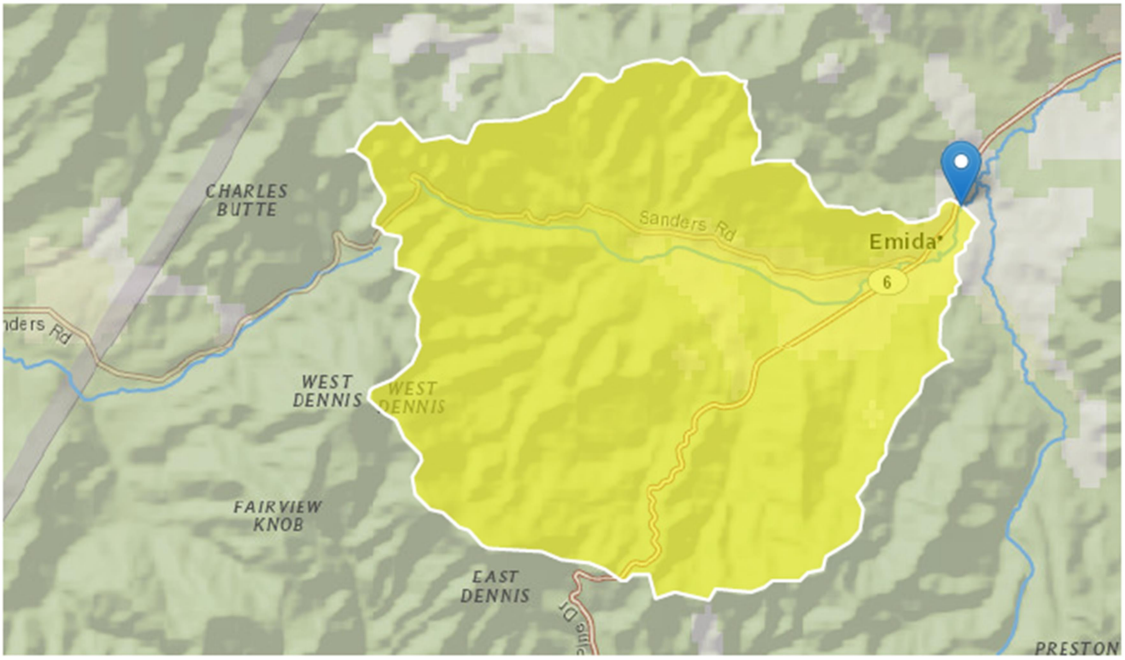
$$AML = 286\ \text{ug/L}$$

Average Monthly Limit = 0.0286 mg/L × 0.0104 mgd × 8.34 = 0.025 lb/day

The Low Flow Statistics report used to determine the critical low flows for Emida WWT using USGS StreamStats.

Emida StreamStats Report

Region ID: ID
Workspace ID: ID20180420200949670000
Clicked Point (Latitude, Longitude): 47.12038, -116.59417
Time: 2018-04-20 14:10:07 -0600



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	22.39	square miles
PRECIP	Mean Annual Precipitation	36	inches

Low-Flow Statistics Parameters [100 Percent (22.4 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	22.39	square miles	3	2442.5

https://streamstats.usgs.gov/ss/ 1/2

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIP	Mean Annual Precipitation	36	inches	24.8	69.4

Low-Flow Statistics Flow Report [100 Percent (22.4 square miles) Low Flow Region 2]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
1 Day 10 Year Low Flow	1.88	ft^3/s	89	95
7 Day 2 Year Low Flow	3.77	ft^3/s	62	64
7 Day 10 Year Low Flow	2.37	ft^3/s	84	89
30 Day 5 Year Low Flow	3.38	ft^3/s	70	73

Low-Flow Statistics Citations

Hortness, J.E., and Berenbrock, Charles,2001, Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01–4093, 36 p. (http://idaho.usgs.gov/PDF/wri014093/index.html)

Table 18. TMDL TSS WLA Limit Calculations

Annual/Seasonal Limit Calculations where the TMDL WLA is Assumed the LTA

6.8 tons/year

ENTER TMDL WLA: **37.5** units usually as a load (i.e. lb/day)

Multiplier to Calculate Permit Limits from LTA Reference: TSD Page 103

Number of Samples per Month (n)				**2**
Number of Samples per Week Set (n/4)				**0.5**
(i.e. 4 if sampling weekly for a month)				
Coefficient of Variation (CV) = Std. Dev./Mean				**0.6**
monthly σ	σ = std deviation			0.407
	$\sigma^2=\ln(CV^2/n+1)$			0.166
weekly σ	σ = std deviation			0.555
	$\sigma^2=\ln(CV^2+1)$			0.307
Average Monthly Limit (AML),	$\exp(z\sigma_n-0.5z\sigma_n^2)$; where % probability basis =	95%	Z= 1.64	1.80
Average Weekly Limit (AWL),	$\exp(z\sigma_{n/4}-0.5z\sigma_{n/4}^2)$; where % probability basis =	99%	Z= 2.33	4.23
Ratio AWL/AML				2.35

Calculation:	**LTA, Limiting**	**x**	**Multiplier**	=	**Limit**	
AML = LTA, limiting x Multiplier	37.5	x	1.80	=	67.4	lb/day
AWL = AML x Multiplier	67.41	x	2.35	=	159	lb/day
AAL/AAS=					37.5	lb/day

Table 19. Emida WWTF RPA for TRC

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

Facility Name	Emida
Facility Flow (mgd)	0.010
Facility Flow (cfs)	0.016

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	1.88	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	2.37	cfs
Ammonia	30B3/30Q10 (seasonal)		cfs
Human Health - Non-Carcinogen	30Q5	3.38	cfs
Human Health - carcinogen	Harmonic Mean Flow		cfs

Receiving Water Data		Notes:	Annual
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th prctile at critical flow	
Temperature, °C	Temperature, °C	90th - 95th percentile	
pH, S.U.	pH, S.U.	90th - 95th percentile	

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages	CHLORINE (Total Residual)
Effluent Data	Number of Samples in Data Set (n)			10
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)			0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)			750
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only			
Receiving Water Statistics	90th Percentile Conc., µg/L - (C_u)			0
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	--	19.
	Aquatic Life Criteria, µg/L	Chronic	--	11.
	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		--	N
Percent River Flow	Aquatic Life - Acute	1Q10	--	25.0%
	Aquatic Life - Chronic	7Q10 or 4B3		25.00%
		30B3 or 30Q10		--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	--	--
	Human Health - Carcinogen	Harmonic Mean		--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	--	30.2
	Aquatic Life - Chronic	7Q10 or 4B3		37.8
		30B3 or 30Q10		--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	--	--
	Human Health - Carcinogen	Harmonic Mean		--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		--	0.555
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	99%	--	0.631
Multiplier (TSD p. 57)	=exp(zσ-0.5σ^2)/exp[normsinv(P_n)σ-0.5σ^2], where	99%	--	3.0
Statistically projected critical discharge concentration (C_e)			--	2263.44
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	--	74.92
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	--	59.84
Reasonable Potential to exceed Aquatic Life Criteria			--	Yes

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)			--	0.600
Permit Limit Coeff. Var. (CV), decimal (Use CV from data set or default = 0.6)			--	0.600
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a - 1)$	Acute	--	574.0
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c - 1)$	Chronic	--	416.1
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2 - z\sigma)$, Acute	99%	--	184.3
(99^{th} % occurrence prob.)	WLAa x $\exp(0.5\sigma^2 - z\sigma)$; ammonia n=30, Chronic	99%	--	219.4
Limiting LTA, ug/L	used as basis for limits calculation		--	184.3
Applicable Metals Criteria Translator (metals limits as total recoverable)				--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		95%	--	**286**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		99%	--	**574**
Average Monthly Limit (AML), mg/L			--	**0.286**
Maximum Daily Limit (MDL), mg/L			--	**0.574**
Average Monthly Limit (AML), lb/day			--	**0.025**
Maximum Daily Limit (MDL), lb/day			--	**0.050**

Human Health Reasonable Potential Analysis

σ	$\sigma^2 = \ln(CV^2 + 1)$		0.555
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	95%	0.741
Multiplier	$=\exp(2.326\sigma - 0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma - 0.5\sigma^2]$,	50%	0.699
Dilution Factor (for Human Health Criteria)		.	--
Max Conc. at edge of Chronic Zone, ug/L (C_d)			--
Reasonable Potential to exceed HH Water & Organism			**NO**
Reasonable Potential to exceed HH Organism Only			**NO**

A. Mixing Zone Analysis

The dilution factor equation (Equation 2) is used to determine the level of mixing zone analysis required. This is a minor facility with a dilution factor greater than 20, requiring a Level 1 mixing zone analysis as per the Idaho Mixing Zone Guidance.

$$\text{Dilution Factor} = D_f = \frac{(Q_S \times P + Q_e)}{Q_e} = \frac{(Q_s \times P)}{Q_e} + 1$$

Equation 10. Dilution factor calculation.

Where: D_f= Dilution factor

Qs = Receiving water low-flow condition (cfs) = 1.88 cfs at 1Q10

P = Mixing zone percentage = 25% as instructed by Mixing Zone Guidance

Qe = Effluent discharge flow (cfs) = 0.016 cfs (0.0104 mgd)

$$\text{Dilution Factor} = 30 = \frac{(1.88 \text{ cfs} \times 25\%)}{0.016 \text{ cfs}} + 1$$

Appendix C. Your Right to Appeal

Persons aggrieved, as specified in IDAPA 58.01.25.204.01.a, have a right to appeal the final permit decision to the Board of Environmental Quality. A Petition for Review must be filed with the Department's Hearing Coordinator within twenty eight (28) days after the Department serves notice of the final permit decision under IDAPA 58.01.25.107 (Decision Process).

All documents concerning actions governed by these rules must be filed with the Hearing Coordinator at the following address: Hearing Coordinator, Department of Environmental Quality, 1410 N. Hilton, Boise, ID 83706-1255. Documents may also be filed by FAX at FAX No. (208) 373-0481 or may be filed electronically. The originating party is responsible for retaining proof of filing by FAX. The documents are deemed to be filed on the date received by the Hearing Coordinator. Upon receipt of the filed document, the Hearing Coordinator will provide a conformed copy to the originating party. Additional requirements for appeals of IPDES final permit decisions can be found in IDAPA 58.01.25.204.

Appendix D. Public Involvement and Public Comments

A. Public Involvement Information

DEQ proposes to reissue a permit to the Emida Water and Sewer Association, Inc. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and DEQ's reasons for requiring permit conditions.

DEQ placed a Public Notice of Draft on 03/18/2020 in the St. Maries Gazette Record to inform the public and to invite comment on the draft Idaho Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the draft permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on DEQ's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the draft IPDES permit.
- Explains the next step(s) in the permitting process.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, ID 83706
• (208) 373-0502
www.idaho.deq.gov

Brad Little, Governor
John H. Tippets, Director

DEQ SEEKS COMMENT ON DRAFT IDAHO POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR THE EMIDA WATER AND SEWER ASSOCIATION, INC. WASTEWATER TREATMENT FACIITY

PROPOSED ACTION: The Emida Water and Sewer Association, Inc. has applied to the Department of Environmental Quality (DEQ) for an Idaho Pollutant Discharge Elimination (IPDES) wastewater discharge permit for its wastewater treatment facility located at Highway 6 and Blackwell R.R. Lane, Emida, ID. DEQ is seeking public comment on the draft IPDES permit, associated fact sheet, and application for the Emida Wastewater Treatment Facility. This proposed permit authorizes the discharge of treated municipal wastewater year-round to Santa Creek for five years. The permit identifies the pollutants of concern and lists the required limits for each pollutant or parameter, and monitoring and reporting requirements necessary to ensure compliance with the permit and protect human health and the environment.

PUBLIC COMMENT PERIOD: Notice is given that DEQ has scheduled a period to receive public comments on the draft permit and fact sheet through Friday, April 17th, 2020 at 5 p.m. MST. A public meeting may be held, if requested in writing by Wednesday, April 1st, 2020. The draft permit and fact sheet are available for public review at DEQ's state office in Boise, the Coeur d'Alene Regional Office, and on DEQ's website.
http://www.deq.idaho.gov/news-public-comments-events/

SUBMISSION OF WRITTEN COMMENTS–ASSISTANCE ON TECHNICAL QUESTIONS:
Anyone may submit written comment regarding the proposed permit. To be most effective, comments should address water quality considerations and include supporting materials where available. Comments, requests, and questions regarding the public comment process should be directed to Karen Jackson at the address below; or to the DEQ Web site at http://www.deq.idaho.gov. Please reference the city name and permit number when sending comments or questions. All information regarding this matter, including the issuance of the final permit, will be available on DEQ's website.
Please submit requests for a public meeting electronically on DEQ's website, by mail, or email to Lori Flook.

Lori Flook
Idaho Department of Environmental Quality
Surface & Wastewater Division
1410 N. Hilton
Boise, ID 83706
Email: Lori.Flook@deq.idaho.gov

Karen Jackson
Idaho Department of Environmental Quality
Surface & Wastewater Division
1410 N. Hilton
Boise, ID 83706
Email: Karen.Jackson@deq.idaho.gov

B. Public Comments and Response to Comments

Idaho Pollutant Discharge Elimination System Discharge Permit No. ID0028487

Response to Comments on Draft Emida Water and Sewer Association, Inc. IPDES Permit

April 17, 2020 comment deadline

Idaho Conservation League April 17, 2020 Letter

1. **Treatment Equivalent to Secondary**

ICL requests DEQ decline to issue Emida effluent limits for BOD_5 and TSS according to treatment equivalent to secondary ("TES") standards, and, instead, issue Emida effluent limits in accordance with the secondary treatment requirements under 40 CFR §133.102. There are several problems with DEQ's justification for proposing effluent limits under the TES exception, which we discuss below.

Alternatives to the technology-based effluent limits for BOD_5 and TSS required by 40 CFR §133.102 may only be considered for facilities that are eligible under two separate sets of criteria – one set of which DEQ misapplied in its Factsheet, the other DEQ ignored altogether.

First, DEQ misapplied the eligibility criteria when it authorized effluent concentrations limits for Emida according to TES. As DEQ stated in its Factsheet, a facility qualifies for TES by meeting all three of the following criteria:

> 1. The BOD_5 and TSS effluent concentrations consistently achievable through proper operation and maintenance (§133.101(g)) of the treatment works exceed the minimum level of the effluent quality set forth in §133.102(a) and §133.102(b);
>
> 2. A trickling filter or waste stabilization pond is used as the principal process; and
>
> 3. The treatment works provide significant biological treatment of municipal wastewater.

Significant biological treatment (§133.101(k)) is defined as the use of an aerobic or anaerobic biological treatment process in a treatment works to consistently achieve a 30-day average of at least 65 percent removal of BOD_5.

40 CFR §133.101(g).

DEQ has not shown and cannot show that Emida meets either the first or the third criteria. As DEQ indicated in its Factsheet, Emida has been operating without an effective discharge permit since 1993 and failed to provide any DMR data from which DEQ could characterize the recent concentrations of Emida's effluent. As a result, DEQ has no quantitative basis to show that Emida's BOD_5 and TSS effluent concentrations exceed the secondary treatment minimums set forth in §133.102 or that Emida's treatment works provide significant biological treatment of municipal wastewater. Accordingly, DEQ must issue Emida effluent limits for BOD_5 and TSS pursuant to the secondary treatment standards.

Second, DEQ failed to consider or show that Emida is eligible for BOD_5 and TSS percent removal effluent limits according to TES. For a facility to qualify for TES, the facility must not only meet all three criteria set forth at §133.101(g) but also the criteria set forth at §133.103(d).[ii] As the TES provision at §133.105 states: "All requirements for the specified parameters in paragraphs (a), (b), and (c) of this section shall be achieved *except as provided for in §133.103*…" (emphasis added).

Section §133.103(d) provides the criteria that determine whether or not Emida is eligible for percent removal requirements according to TES, and the criteria include:

> 1. The treatment works is consistently meeting, or will consistently meet, its permit effluent concentration limits but its percent removal requirements cannot be met due to less concentrated influent wastewater;
>
> 2. To meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards; and
>
> 3. The less concentrated influent wastewater is not the result of excessive I/I.

It does not appear that Emida meets any of the three criteria above, nor has DEQ shown, quantitatively or with other evidence, this to be the case. Therefore, DEQ must issue Emida percent removal effluent limits according to the secondary treatment standards.

To summarize, ICL requests DEQ revise its Factsheet and IPDES permit for Emida to include effluent limits for BOD_5 and TSS according to the secondary treatment standards provided at 40 CFR §133.102 and as stated in DEQ's Factsheet in Table 6, at page 17.

Response 1: DEQ agrees that data are no available to demonstrate the facility qualifies for TES based on criteria 1 and 3 of 40 CFR §133.101(g) .

[ii] For a discussion of how to apply TES, *see* EPA's May 11, 2018 Factsheet for the NPDES Permit for the City of Harrison Wastewater Treatment Plant, available at https://www.epa.gov/sites/production/files/2018-05/documents/r10-npdes-harrison-id0021997-fact-sheet-2018.pdf

Changes to draft permit: Secondary treatment standard TBELs have been included in the permit, and the fact sheet has been updated accordingly (section 3.2).

2. **Compliance Inspection Concern**

   ICL requests DEQ provide more discussion of the area of concern that EPA Region 10 identified in its inspection of Emida on May 21, 2015 and issue a compliance schedule in Emida's new permit, requiring Emida to address this area of concern.

   In DEQ's Factsheet at page 10, DEQ reported that EPA Region 10 inspected Emida's facility and identified an area of concern – Emida's potential failure to identify and manage a regulated waste or pollutant from the lagoon during wet weather events. We request DEQ answer whether or not Emida has the capacity and/or infrastructure to manage its waste and pollutants, if it were to experience a significant or prolonged wet weather event. If Emida cannot, we request DEQ issue a compliance schedule in Emida's IPDES permit, to ensure Emida install the necessary infrastructure to control its waste during wet weather events.

Response 2: The 2015 EPA inspection report stated the area of concern was:

"A. Historic Discharge from the Lagoon to Santa Creek.

Although not discharging at the time of inspection, and now plugged at the outfall, the historic discharge from the lagoon to Santa Creek during wet seasons, along with the unknown flow and collection data is a concern."

The design capacity of a system to process waste, and the ability of the facility's infrastructure to handle regional weather events are items typically covered in a POTW's facility plan under Wastewater Rules (IDAPA 58.01.16.410). However, a facility plan is currently required in the TRC compliance schedule (item 5).

Compliance schedules are typically granted to allow facility improvements to attain currently unattainable permit limits, CWA requirements, or IPDES requirements (IDAPA 58.01.25.305). DEQ has included the facility plan as a compliance schedule task for Emida, as it is required for "new municipal wastewater treatment or disposal facilities, and all existing municipal wastewater treatment or disposal facilities undergoing material modification or expansion" (IDAPA 58.01.16.410). DEQ is using BPJ to treat the Emida facility as a POTW, and material modification will likely be necessary to meet TRC limits. In a future permit, once data are available, DEQ may address design capacity issues as outlined in Idaho User's Guide to Permitting and Compliance - Volume 2 Section 4.7.2. (https://www.deq.idaho.gov/media/60180946/ipdes-user-guide-ipdes-permitting-compliance-vol2-publicly-owned-treatment-works-1217.pdf).

Changes to draft permit: None.

3. **Monitoring Requirements**

ICL requests DEQ explain how frequently Emida discharges its effluent between October and May. This information is important to understand because according to DEQ's proposed effluent and influent monitoring requirements, nothing prevents Emida from conducting its effluent monitoring during times the facility is not discharging. We request DEQ clarify in Emida's IPDES permit that all effluent and monitoring must be conducted during times the facility is discharging.

Response 3: Currently there are no records of effluent discharges. According to the 2015 EPA inspection the past operator "was unsure of the last time the lagoon had a discharge through the overflow pipe, as there is no monitoring or recording device…the lagoon outfall in [sic] now plugged to prevent any discharge via the overflow pipe." To DEQ's knowledge there have been no discharges from 2015 to present, and the facility may only need to discharge infrequently in the future.

If the facility does not discharge during the reporting period (i.e., the calendar month), it would use the appropriate No Date Indicator (NODI) code in DMR reports. If there is discharge at any time during the reporting period (i.e., calendar month), the permittee must sample at the frequency specified in the permit. Discharge timing is up to the discretion of a licensed operator. For example, a permittee required to sample weekly might only discharge during the last week of their reporting period, and would subsequently only be required to sample the effluent once for that reporting period. However, influent samples would still need to be conducted weekly, despite not discharging for three weeks.

Changes to draft permit: None.

4. **Emida's Operations between June and September**

ICL requests DEQ explain how Emida operates its facility to enable it to avoid discharging during the months between June and September and what IPDES permit mechanisms ensure Emida will not discharge during this time period. We have several concerns related to the seasonality of Emida's operations.

First, Emida is unique in that it maintains only a single wastewater treatment lagoon rather than two. We suspect this limits Emida's capacity to store wastewater during the summer and early fall months, and we are unsure whether a single lagoon provides sufficient storage capacity, especially considering EPA Region 10 identified that Emida does not have the infrastructure to prevent wastewater overflow during wet weather events.

Second, and as DEQ noted, there have been no significant changes or upgrades to Emida's facility since 1988, which makes us concerned about the current functionality of Emida's lone wastewater lagoon. Accordingly, we request DEQ provide a discussion of the status of Emida's lagoon, including whether and how it is lined, when it was last seepage tested, and whether there is a groundwater/surface water connection between the

groundwater beneath Emida's lagoon and the surface water in Santa Creek. This is critical information to understand given the tenuous water quality conditions of waterbodies downstream of Emida's facility, including Lake Coeur d'Alene, which is being managed for nutrient pollution (Emida discharges into Santa Creek, which is a tributary ultimately to the St. Joe River, the second largest source of nutrient pollution to Lake Coeur d'Alene.). It is critical to understand both whether Emida's lagoon is seeping nutrients or other pollutants into Santa Creek and the concentration and loading of nutrients in Emida's effluent discharge.

To summarize, ICL requests DEQ discuss Emida's operations between June and September and how it is possible for Emida to avoid the need to discharge during this portion of the year. In addition, we request a more detailed discussion of whether Emida's operation of its lagoon and effluent discharge is protective of downstream water quality needs and requirements, notably the urgent need to reduce nutrient pollution into Lake Coeur d'Alene. To ensure downstream water quality is protected, we request DEQ issue monthly effluent monitoring requirements for phosphorus. If DEQ declines these requests, we further request DEQ explain the basis for its decision to decline.

Response 4: As stated in Response 3, currently there are no records of effluent discharges and to DEQ's knowledge there have been no discharge since 2015. To DEQ's knowledge, the pipe is currently plugged. Discharge between June 1 and October 15 is a violation of their permit, and subject to compliance and enforcement action. If a discharge between June 1st and October 15th were to occur, the facility would need to adhere to sections 2.2.7 (24-Hour Notice of Noncompliance), 2.2.8 (5-Day Written Submission for Noncompliance), 4.2.12 (Bypass of Treatment Facilities) and 4.2.13 (Upset Terms and Conditions) of the permit.

Lagoon storage capacity and seepage are regulated under IDAPA 58.01.16 (Wastewater Rules) and the facility is currently in a Compliance Agreement Schedule (CAS) with DEQ, signed in May of 2014, and amended in 2017 to address seepage testing and impacts to groundwater.

With regards to total phosphorus monitoring, DEQ agrees with this comment and has added monthly effluent monitoring and 4x/year receiving water monitoring.

Changes to draft permit: Total phosphorus monitoring has been included in routine effluent monitoring and routine receiving water monitoring. Additional language has been added to the fact sheet to support this addition.

5. **Dilution Factor**

ICL requests DEQ explain how it calculated the effluent limits for TRC according to

Idaho DEQ's Mixing Zone Implementation Guidance, which directs DEQ to adjust the mixing zone percentage to no larger than necessary by back calculating the dilution factor downwards toward the value of 20, for minor discharges with a dilution factor greater than 20. DEQ identified Emida's dilution factor to be 32, but DEQ's Factsheet failed to

discuss how DEQ applied the directive at Section 3.4.2 in the Mixing Zone Implementation Guidance to back calculate the dilution factor to the value of 20.

Response 5:

IDAPA 58.01.02.060.01.c states:

"The size of mixing zone(s) and the concentration of pollutant(s) present shall be evaluated based on the permitted design flow. The Department shall not authorize a mixing zone that is determined to be larger than is necessary considering siting, technological, and managerial options available to the discharger."

The section the commenter is referring to in the Mixing Zone Implementation Guidance Section 3.4.2 for Level 1 analysis states:

"For minor dischargers with a dilution factor greater than 20, the mixing zone percentage may be adjusted to no larger than necessary by back calculating the dilution factor downwards toward the value of 20.

The Mixing Zone Implementation Guidance was finalized in December of 2016, before the Idaho DEQ received primacy of IPDES POTW permits, and before limit development guidance was written. The original audience of Mixing Zone Implementation Guidance was DEQ's 401 certification staff and entities that authorized discharges/changes to rivers – EPA and the US Army Corps of Engineers. Reducing the mixing zone based on dilution factor may still be implemented in 401 certifications; however, the IPDES program identified its method of not authorizing mixing zones larger than necessary as follows (IPDES Effluent Limit Development Guidance Section 3.4.3, December 2017):

"The preferred approach is for DEQ to statistically evaluate facility performance data. The 95th percentile of the effluent data should be used to evaluate the appropriate mixing zone percentage. The mixing zone should be optimized to establish the minimum surface water volume and stream width or nonflowing water area, accompanied by an adjusted dilution factor. These parameters are optimized to the lowest percentage of dilution that would not result in RPTE at the edge of the mixing zone. At that point, the mixing zone may be authorized. Mixing zone percentages are rounded up to the nearest whole number (e.g., analysis demonstrates a 9.05% mixing zone is necessary, and the percent authorized should be 10%)."

Both methods described above serve to minimize the mixing zone size, and prevent authorizing a larger than necessary mixing zone. However, the Mixing Zone Implementation Guidance disproportionately impacts permittees with smaller discharges relative to the receiving water, and it is additionally restrictive to the lowest risk dischargers when critical (worst case) conditions are already included in the model. The method identified in the IPDES Effluent Limit Development Guidance and used in this permit is consistent across permittees, while still being compliant with IDAPA 58.01.02.060.01.c.

In this permit, there is RPTE at 25% mixing, thus the mixing zone is not reduced further.

Changes to draft permit: The dilution factor for mixing zone analysis has been corrected from 32 to 30, and the equation has been added to Appendix B of the fact sheet.

6. **Effluent Limits for E. coli**

   In the Factsheet, DEQ states that the E. coli limits in Emida's draft IPDES permit are equal to, or more protective of, water quality criteria for fecal coliform in Emida's last permit. ICL requests DEQ please show how these effluent limits are equal to, or more protective of, water quality criteria in the last permit.

Response 6: As stated in the fact sheet, in 1986 EPA updated its criteria to protect recreational use of water recommending an E. coli criterion as a better indicator of bacteria levels that may cause gastrointestinal distress in swimmers than fecal coliform. In 2000, DEQ changed its WQS criterion from fecal coliform to E. coli. The fecal coliform limits were in the previous permit because fecal coliform was the WQS at the time the permit was issued. The E. coli limits are equal, or more, protective of water quality criteria than the old fecal coliform limits because fecal coliform criteria/standards no longer exist. The new limits are protective of the new criteria.

Changes to draft permit: None.

EPA Correspondence

On Page 15, in Footnote "g" to Table 4, there's a reference error ("Section Error! Reference source not found. of this permit").

Between Pages 32 and 33, there's an oddly-placed page break, such that Page 33 is blank except for the words "Table 14, below."

Response 7: DEQ agrees with these edits.

Changes to draft permit: Text edits have been made to the fact sheet.

Other changes

Permit template text changes to improve clarity of the permit include:

- Section 3.5.1 of the Fact Sheet antidegradation template language has been updated.
- References to a sludge management plan have been removed, as the facility does not currently fall under 40 CFR 503 regulations. A sludge depth report is required.