Fact Sheet for IPDES Permit No. ID0020036

04/02/2020

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

City of Grangeville Wastewater Treatment Plant
174 Airport Road
Grangeville, ID 83530

Public Comment Start Date:	01/08/2020
Public Comment Expiration Date:	02/07/2020
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 writing the Idaho Pollutant Discharge Elimination System (IPDES) permit for the City of Grangeville Wastewater Treatment Plant (WWTP).

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

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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
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
I/I	Inflow and Infiltration
IPDES	Idaho Pollutant Discharge Elimination System
lbs/day	Pounds per day
LTA	Long Term Average
MDL	Method Detection Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
mL	Milliliters
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
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_c	Toxic Units, Chronic
WET	Whole Effluent Toxicity
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQC	Water Quality Criteria
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

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 the City of Grangeville Wastewater Treatment Plant (WWTP). 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 draft permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

DEQ proposes to reissue the IPDES permit for the City of Grangeville WWTP. 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, draft 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 draft permit must do so in writing within 14 calendar days of public notice being published that a draft permit has been prepared; requests for public meetings must be submitted to DEQ by 01/22/2020. 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 draft permit in response to the public comments. DEQ will include the summary and responses to comments in Appendix E 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 draft 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 draft 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 draft 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
208-373-0502

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

DEQ Lewiston Regional Office
1118 F Street
Lewiston, ID 83501

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.

2 Background Information

2.1 Facility Description

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

Table 1. Facility information.

Permittee	City of Grangeville WWTP
Facility Physical Address	174 Airport Road, Grangeville, ID 83530
Facility Mailing Address	225 West North Street, Grangeville, ID 83530
Facility Contact	Mike Tackett
Responsible Official	Robert Mager
Facility Location	Latitude: 45.938167°N Longitude: -116.114426°W
Receiving Water Name	Threemile Creek
Outfall Location	Latitude: 45.939753° Longitude: -116.112250°
Permit Status	
Application Submittal Date	March 16, 2010
Date Application Deemed Complete	September 20, 2010 by EPA

The City of Grangeville (City) owns and operates the City of Grangeville Publicly Owned Treatment Works (POTW) located in Grangeville, Idaho County, Idaho. The collection system has no combined sewers. The facility serves a resident population of 3,228 based on their permit application. There are two minor industrial users that discharge only sanitary waste to the facility.

2.1.1 Facility Information

The design flow of the facility is 0.88 mgd. The treatment process consists of an extended aeration activated sludge process using oxidation ditches with boat clarifiers to treat domestic wastewater with sand filters used seasonally. 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 design flow, the facility is considered a minor facility. The WWTP is currently managed by one (1) contracted consultant wastewater operator, and two (2) city employee wastewater operators.

The WWTP is operated by the City and receives wastewater from approximately 1,200 connections of residential and light commercial facilities. No industrial process water or major commercial facility discharges to the treatment plant. Wastewater enters the WWTP via gravity in the southwest headworks building. Waste haulers with portable toilet waste discharge to the City system via a manhole up-gradient of the headworks. Headworks processes include a mechanically cleaned bar screen and grit removal chamber. Wastewater is then treated by parallel oxidation ditches with in-channel clarifiers for biological treatment. The ditches introduce air to the wastewater via bottom-mounted diffusers. Flow is measured exiting the

oxidation ditch clarifiers. After biological treatment, sodium hypochlorite is injected upstream of a rapid mixer for wastewater disinfection. The WWTP discharges wastewater flow into a serpentine contact chamber. After disinfection, treated water flows over the effluent weirs and is then recombined under a de-chlorination manhole. Sulfur dioxide is injected at the de-chlorination manhole to meet total residual chlorine limits.

From July through September an alternative flow path to tertiary phosphorus treatment is used to convey wastewater into the filter feed pump station and ultimately through the up-flow sand filters. Filter backwash water and all floor drain water are returned to the headworks. The filtered wastewater has a dedicated chlorine injection manhole, and wastewater is routed to the chlorine contact basins, undergoes dechlorination, and discharges via Outfall 001 (see Appendix A).

2.1.2 Permit History

During the early 1900s the original collection system directed wastewater to a septic tank along Threemile Creek north of the City. A trickling filter wastewater plant was built during the 1950s, and underwent a significant upgrade in the late 1980s. The upgrade included installation of headworks, an oxidation ditch with boat clarifiers, and chlorine disinfection. The dechlorination system was installed in 2007.

The previous permit became effective on October 1, 2005 and expired on September 30, 2010. The WWTP submitted a permit application in March 2010. Additional information was requested by EPA, which was received on September 15, 2010. The application was deemed complete and the permit was administratively extended.

Since 2004, the City has implemented proactive sewer line replacement to reduce I/I. Over 15,000 linear feet of sewer pipe was replaced between 2004 and 2010. Approximately 3,000 feet of sewer line was replaced during the tertiary treatment upgrade as well to reduced inflow and infiltration (I/I) to the WWTP.

Since the last permit was issued in 2005, the WWTP has installed up-flow sand filters as tertiary treatment for phosphorus and installed a new sludge dewatering unit. The 2012/2013 upgrades consisted of a filter feed pump station, continuous backwash up-flow filters, and associated chemical system for phosphorus coagulation and effluent filtration. The up-flow sand filters are typically used June through September to meet phosphorus total maximum daily load waste load allocation (TMDL WLA) requirements. The 2013/2014 upgrades included improvements to the water reuse system, Huber screw press dewatering system, motor control center replacement, new generator, and electrical system upgrades.

The POTW is currently in the process of purchasing new blowers and aerators for the oxidation ditches. A new aerator was installed in one oxidation ditch in July 2019. A second one is planned to be installed in the second oxidation ditch in the summer of 2020. The new equipment is expected to improve ammonia treatment. Only one oxidation ditch can be taken offline at a time, thus installation of new equipment will take a minimum of two years.

2.1.3 Compliance History

A Compliance Order was issued by the US EPA Region 10 on December 21, 2011. The Compliance Order instructed the WWTP to construct upgrades to achieve full effluent limit compliance by July 1, 2013. Facility improvements described in the section above were completed to address and close the Compliance Order.

DEQ reviewed effluent monitoring data since the last permit's issuance (2005 – 2019) to determine compliance. The data are summarized in the table below. A summary of effluent violations is provided in Table 2. After completion of the Compliance Order upgrades in 2013 there was one effluent violation (TSS Percent Removal - 74%).

Table 2. Effluent limit violations (2005 – 2019).

Parameter	Violation Type	Number of Instances	Number of Instances Post-2013
Chlorine, Total Residual – Daily Maximum (mg/L)	DMR Exceedance	20	0
Chlorine, Total Residual – Monthly Average (mg/L)	DMR Exceedance	25	0
E. coli – Geomean	DMR Exceedance	6	0
E. coli - Instantaneous and Monthly	DMR Exceedance	7	0
TSS Percent Removal	DMR Exceedance	1	1
Phosphorus (mg/L)	DMR Exceedance	10	0
Phosphorus (lb/day)	DMR Exceedance	10	0
pH – Maximum & Minimum	DMR Exceedance	3	0

DEQ conducted an inspection of the facility in April 2017. The inspection encompassed laboratory facilities, influent screening, oxidation ditches, tertiary treatment, disinfection, sludge dewatering, outfall, and surrounding premises. Overall, the results of the inspection indicated employee turnover in 2012 and 2013 may account for missing documentation, and it was noted that effluent from one of the chlorine contact chambers may not be representatively sampled.

2.1.4 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. Sludge disposal plans must be submitted to DEQ and must follow the procedures in IDAPA 58.01.16. A Biosolids Management Plan dated November 17, 2017 was submitted to DEQ and reviewed to meet Idaho Wastewater Rules (IDAPA 58.01.16).

Sludge is transferred from the oxidation ditch via inter-channel clarifiers and is stored in an aeration digester for further biological treatment. From the aerated digester sludge is pumped into a Huber screw press dewatering unit. The dewatering unit further separates solids and supernatant liquid. Supernatant is returned to the headworks building upstream of the band

screen. Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A.

2.1.5 Outfall Description

Outfall 001 is located on left bank of Threemile Creek (looking downstream), approximately 450 feet northeast of the disinfection facilities. The PVC outfall pipe is approximately 24 inches in diameter. The effluent enters the stream at the base of a step/riffle. The City discharges continuously throughout the year.

2.1.6 Wastewater Influent Characterization

The WWTP reported the concentration of influent pollutants in Discharge Monitoring Reports (DMRs) and results are characterized in Table 3. The tabulated data represents the quality of the influent wastewater received from October 2005 to May 2019.

Table 3. Wastewater influent characterization (2005 - 2019).

Parameter	Units	# of Samples	Average Value	Maximum Value	Data Source
BOD_5	mg/L	164	157	435	DMRs
TSS	mg/L	164	220	1,860	DMRs

2.1.7 Wastewater Effluent Characterization

The WWTP reported the effluent pollutant concentrations in DMRs and results are characterized in Table 4. The tabulated data represents the quality of the effluent discharged from October 2005 to May 2019. The data for total phosphorus are taken from July 2013 through May 2019, to account for the installation of the sand filters. The City's reapplication data included EPA Form 3510-2A basic effluent testing (section A.12), and effluent testing for facilities with a design flow greater than 0.1 mgd (section B.6).

Table 4. Wastewater effluent characterization (2005 - 2019).

Parameter[a]	Average	Maximum	Instantaneous Maximum	# of Samples	Data Source
Flow (mgd)	0.66	1.8	---	163	DMR
BOD_5 (mg/L)	3.5	16	---	163	DMR
BOD_5 % Removal	97	86 (minimum)	---		
TSS (mg/L)	8.3	25	---	163	DMR
TSS % Removal	95	74 (minimum)	---		
E. coli (#/100mL)	35 (geometric mean)	---	1127 (geometric mean)	164	DMR
Total Residual Chlorine (mg/L) [b]	0.2	2.5	---	1,528	Facility
pH (SU)	---	8.8	6.3 (minimum)	327	DMR
Total Ammonia (as N) (mg/L) [b]	1.36	15.5	---	76	DMR
Total Inorganic Nitrogen (mg/L)	15	31	---	147	DMR
Dissolved Oxygen (mg/L)	6.8	1.2 (minimum)	---	164	DMR
Total Phosphorus as P (mg/L) [b]	0.17	0.66	---	16	DMR
Nitrate + Nitrite as Nitrogen (mg/L)	26.76	---	---	1	Section A.12 Application
Total Kjeldahl Nitrogen (mg/L)	1.23	---	---	1	Section A.12 Application
Oil & Grease (mg/L)	1.4	---	---	1	Section A.12 Application
Total Dissolved Solids (mg/L)	415	---	---	1	Section A.12 Application

a. Taken from monthly average DMR data.
b. Characterization from 2013-2019. Upgrade significantly impacted this pollutant.

2.2 Description of Receiving Water

The WWTP discharges to Threemile Creek in Grangeville, Idaho in the South Fork Clearwater subbasin (HUC 17060305). The outfall is located 0.15 miles downstream of Airport Road crossing Threemile Creek. No other point source outfalls exist upstream of the WWTP. Nearby non-point sources of pollutants include storm water, farming, and livestock grazing. The upper reaches of Threemile Creek flow through dryland farming and livestock grazing areas. In Grangeville, the stream is impacted by storm water runoff and domestic livestock grazing. The Threemile Creek drainage is in poor condition due to agricultural activities, riparian degradation from grazing, and urban impacts.

All upstream and downstream drinking water sources are groundwater. Section 2.2.1 of this fact sheet describes any receiving waterbody impairments.

Idaho's water quality standards (WQS) (IDAPA 58.01.02.100) describe designated beneficial uses and the use categories that may be applied in Idaho. Specifically, these are by category (aquatic life, recreation, or water supply) and subcategory (for example, cold water aquatic life or primary contact recreation):

- Aquatic Life—salmonid spawning, cold water, seasonal cold water, or warm water
- Recreation—primary contact or secondary contact
- Water Supply—domestic, agricultural, or industrial

In addition, aesthetic and wildlife uses apply to all waters.

This facility discharges to Threemile Creek in the Assessment Unit (AU) ID17060305CL010_02. At the point of discharge, Threemile Creek is protected for the following designated uses (IDAPA 58.01.02.120.07 C-10):

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

The ambient background data used for this permit includes the following from IDEQ BURP data, TMDL data, and quarterly permittee surface water monitoring (SWM) data from 2006 to 2009.

Table 5. Ambient background data.

Parameter	Unit	Value	Source
Ortho-phosphorus Mean	mg/L	0.05	TMDL, above outfall
Total Nitrogen Mean	mg/L	17.4	TMDL, above outfall
Total Phosphorus Mean	mg/L	0.19	TMDL, above outfall
Nitrate-nitrogen Mean	mg/L	0.06	TMDL, above outfall
E. coli Geometric Mean	#/100mL	1445	TMDL, above outfall
Temperature (Quarter 1)	C	2.7	Average of February 2006-2009 SWM data, grab sample
Temperature (Quarter 2)	C	11.4	Average of May 2006-2009 SWM data, grab sample
Temperature (Quarter 3)	C	18.9	Average of August 2006-2009 SWM data, grab sample
Temperature (Quarter 4)	C	3.3	Average of November 2006-2009 SWM data, grab sample
Temperature (July 2013)	C	18.5	Site ID 2013SLEWA078
Conductivity (July 2013)	uS/cm	484	Site ID 2013SLEWA078
Temperature (Sept 2016)	C	16.2	Statewide Monitoring for Inputs to the Copper Biotic Ligand Model
pH	s.u.	6.6	Average of 2006-2009 SWM data, grab sample
Total Ammonia (as N)	mg/L	0.058	Average of 2006-2009 SWM data, grab sample
Total Inorganic Nitrogen	mg/L	0.30	Average of 2006-2009 SWM data, grab sample
Total Phosphorus (as P)	mg/L	0.12	Average of 2006-2009 SWM data, grab sample
Dissolved Oxygen	mg/L	10.2	Average of 2006-2009 SWM data, grab sample

2.2.1 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.

According to DEQ's 2016 Integrated Report, this AU is not fully supporting one or more of its assessed uses. The aquatic life use in this receiving water body AU is not fully supported. Causes of impairment include flow regime alteration, physical substrate habitat alteration, nutrient/eutrophication biological indicators, low dissolved oxygen, sedimentation/siltation, and high water temperatures. The contact recreation beneficial use is also not fully supported. Causes of impairment include excess *E. coli*. As such, DEQ will provide Tier I protection for both the aquatic life and contact recreation uses (IDAPA 58.01.02.051.01) (see section 3.5).

The EPA-approved South Fork Clearwater River Subbasin Assessment and Total Maximum Daily Loads (March 2004) establishes WLAs for TSS, *E. coli*, total phosphorus, and temperature. 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. Resultant TMDL WLAs include the following:

- *E. coli*: 126 #/100ml monthly geomean, 576 #/100ml daily maximum[1]
- TSS: 30 mg/L monthly average, 45 mg/L weekly average, 40.3 tons/year
- Total phosphorus: 0.49 lbs/day[2] July 1 through September 15
- Temperature: See Table 10 and Table 11

The City identified two potential fish barriers that could preclude the salmonid spawning beneficial use in 2005. DEQ staff conducted a beneficial use assessment study for Threemile Creek from 2005 through 2006. The purpose of the study was to evaluate the salmonid spawning aquatic life beneficial use designation for Threemile Creek, and to characterize the creek's temperature profile above and below the City of Grangeville wastewater treatment plant outfall to determine whether Idaho's point source natural background temperature provision (IDAPA 58.01.02.401.01.e) was applicable. DEQ's beneficial use assessment (DEQ 2008) and temperature study (DEQ 2013) found that salmonid spawning is an applicable beneficial use, the salmonid spawning temperature criteria apply to Threemile Creek from April 1 to May 31, cold water aquatic life criteria apply from July 15 to September 15, and the WWTP effluent discharge contributes to temperature impairment.

2.2.2 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

[1] The 576 #/100mL daily maximum for E. coli is a trigger per IDAPA 58.01.02.251.01, not a limit.
[2] The EPA Approved TMDL allocates this TMDL WLA as 0.22 kg/day.

identified in Table 6. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years while the 1B3 is biologically based and indicates an allowable exceedance of once every 3 years. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years while the 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.

Sources for data that DEQ examines are the United States Geological Survey (USGS), Idaho Department of Water Resources (IDWR) and other available data for the receiving water. Threemile Creek has no active or historical stream gage. For this permit, DEQ determined critical low flows upstream of the discharge from the USGS StreamStats model. The estimated low flows Threemile Creek are presented in Table 6.

Table 6. Low flow design conditions.

Criteria	Flow Condition	Critical Flow (cfs)
Acute aquatic life	1Q10	0.15
Chronic aquatic life	7Q10	0.17
Ammonia	30Q5	0.28

2.3 Pollutants of Concern

DEQ may identify pollutants of concern (POC) for the discharge based on those which:

- Have a technology-based limit
- Have an assigned wasteload allocation (WLA) from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring 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 permit application, previous DMRs, raw discharge data provided by the facility, TMDLs, and the facility's industrial user surveys. The wastewater treatment process for this facility includes an extended aeration activated sludge treatment process. Pollutants expected in the discharge from a facility with this type of treatment are:

- BOD
- TSS
- *E. coli* bacteria
- TRC
- pH
- Temperature
- Total Phosphorus (as P) (TP)
- Total Ammonia (as N)
- Dissolved Oxygen

3 Effluent Limits and Monitoring

Table 7 presents the existing effluent limits and monitoring requirements in the 2005 permit. Table 8 presents the effluent limits and monitoring requirements in the 2020 permit.

Table 7. 2005 Permit - Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit	Sample Location	Sample Frequency	Sample Type
Flow, mgd	—	—	—	—	Effluent	Continuous	Recording
BOD_5	30 mg/L	45 mg/L	—	—	Influent and Effluent	1/month	8-hour composite
	220 lbs/day	330 lbs/day	—	—			
TSS	30 mg/L	45 mg/L	—	—	Influent and Effluent	1/month	8-hour composite
	220 lbs/day	330 lbs/day	—	—			
E. coli	126/100ml	—	—	576/100ml	Effluent	5/month	Grab
Total Residual Chlorine	0.007 mg/L	—	0.018 mg/L	—	Effluent	5/week	Grab
	0.066 lbs/day	—	0.13 lbs/day	—			
Total Phosphorus (July 1- Sept 15)	0.067 mg/L	—	—	—	Effluent	1/month	8-hour composite
	0.49 lbs/day	—	—	—			
pH (SU)	Between 6.5–9.0				Effluent	1/week	Grab
Total Inorganic Nitrogen	—	—	—	—	Effluent	1/month	8-hour composite
Total Ammonia as N, mg/L	—	—	—	—	Effluent	1/month	8-hour composite
Temperature (C)	—	—	—	—	Effluent	1/month	Grab
Dissolved Oxygen, mg/L	—	—	—	—	Effluent	1/month	Grab

Notes:

1. There shall be no discharge of floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water. 4.

2. 85% Removal Requirements for BOD_5 and TSS: For each month, the monthly average effluent concentration shall not exceed 15 percent of the monthly average influent concentration.

Table 8. 2020 Permit - Effluent Limits and Monitoring Requirements

Parameter	Discharge Period	Units	Effluent Limits							Monitoring Requirements		Reporting Period (DMR Months)
			Monthly Average	Weekly Average	Monthly Geometric Mean	Instant-aneous Minimum	Instant-aneous Maximum	Daily Maximum	Maximum Daily Average	Sample Type	Sample Frequency	
Biochemical Oxygen Demand (BOD_5)	01/01 to 12/31	mg/L	30	45	—	—	—	—	—	8-hour composite	1/week	Monthly Reporting
		lb/day	220	330	—	—	—	—	—	Calculation[a]		
BOD_5 Percent Removal	01/01 to 12/31	%	85 (minimum)	—	—	—	—	—	—	Calculation[b]	1/month	Monthly Reporting
Total Suspended Solids (TSS)	01/01 to 12/31	mg/L	30	45	—	—	—	—	—	8-hour composite	1/week	Monthly Reporting
		lb/day	220	330	—	—	—	—	—	Calculation[a]		
TSS Percent Removal	01/01 to 12/31	%	85 (minimum)	—	—	—	—	—	—	Calculation[b]	1/month	Monthly Reporting
E. coli[c, d]	01/01 to 12/31	#/100 ml	—	—	126[e]	—	576	—	—	Grab[f]	5/month	Monthly Reporting
pH[d]	01/01 to 12/31	s.u.	—	—	—	6.5	9.0	—	—	Grab[f]	1/day	Monthly Reporting
Total Residual Chlorine (TRC)[d]	01/01 to 12/31	mg/L	0.007[g]	—	—	—	—	0.018[g]	—	Grab[f]	1/week	Monthly Reporting
		lb/day	0.051[g]	—	—	—	—	0.13[g]	—			
Total Phosphorus (as P) (TP)	07/01 to 09/15	mg/L	—	—	—	—	—		—	8-hour composite	2/month	Monthly Reporting (July, August, September)
		lb/day	0.49	—	—	—	—	—	—			
Total Ammonia (as N)[d, h]	01/01 to 12/31	mg/L	3.6	—	—	—	—	18	—	8-hour composite	1/week	Monthly Reporting
		lb/day	26	—	—	—	—	133	—			
Temperature[h]	06/01 to 07/14[i]	°C	—	—	—	—	23.1	—	20.0[f]	Recording	Continuous[j, k, l, m]	Monthly Reporting (June, July)

Parameter	Discharge Period	Units	Effluent Limits							Monitoring Requirements		Reporting Period (DMR Months)
			Monthly Average	Weekly Average	Monthly Geometric Mean	Instant-aneous Minimum	Instant-aneous Maximum	Daily Maximum	Maximum Daily Average	Sample Type	Sample Frequency	
Temperature	04/01 to 05/31 & 07/15 to 09/15	°C	See Table 10 and Table 11							Recording	Continuous [j, k, l, m]	Monthly Reporting (April, May, July, August, September)

a. 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
b. % Removal= ([Influent](mg/L)-[Effluent](mg/L))/([Influent](mg/L))×100%
Braces "[ ]" indicate concentration of the attribute contained inside
c. Idaho's water quality standards for secondary contact recreation include a single sample value of 576/100 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.
d. Exceedance of a maximum daily limit, instantaneous maximum limit, or instantaneous minimum limit for this parameter requires 24-hour reporting in accordance with 2.2.7. For *E. coli,* the maximum daily threshold that triggers 24-hour reporting is 576 #/100 mL. Please see 2.2.7 for additional 24-hour reporting requirements.
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. A grab sample is an individual sample collected over a 15-minute period or less.
g. The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 0.050 mg/L for this parameter. DEQ will use 0.050 mg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limits if the average monthly and maximum daily concentrations are less than 0.050 mg/L and the average monthly and maximum daily mass loadings are less than 0.37 lbs/day. For purposes of calculating the monthly averages, see Section 2.2.2 of this permit
h. Total ammonia (as N) and temperature have a compliance schedule; see section 3.1 of the permit.
i. Temperature limits outside of this timeframe are list in Table 10 and Table 11, below.
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: maximum daily average.
k. 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 should 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.
l. 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.
m. 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.

Table 9. Pollutants with interim effluent limits for Outfall 001.

Parameter	Interim Limit Period	Units	Effluent Limits		Monitoring Requirements		Reporting Period (DMR Months)
			Monthly Average	Daily Maximum	Sample Type	Sample Frequency	
Temperature[a]	04/01/20 - 05/31/20 to 04/01/38 - 05/31/38	°C	—	17 [b]	Recording	Continuous[c,d,e,f]	Monthly Reporting
	06/01/20 – 07/14/20 to 06/01/38 – 07/14/38		—	22 [b]	Recording	Continuous[c,d,e,f]	Monthly Reporting
	07/15/20 -09/15/20 to 07/15/38 -09/15/38		—	23 [b]	Recording	Continuous[c,d,e,f]	Monthly Reporting
Total Ammonia (as N) [a]	01/01 to 12/31	mg/L	6.1	19	8-hour composite	1/week	Monthly Reporting
		lb/day	44	136			

a. Parameter has a compliance schedule, see section 3.1 of the permit.
b. Performance interim limit based on the 95th percentile of available temperature data from 2004 to 20011.
c. 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: maximum daily average.
d. 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 should 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.
e. 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.
f. 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.

Table 10. TMDL Temperature effluent limits[a,b] for the Grangeville WWTP (April 1 through May 31)

Grangeville Effluent Discharge (cfs)	Effluent Limit Type	Units	Threemile Creek Discharge (cfs)				
			≤0.5	>0.5 ≤1	>1 ≤5	>5 ≤10	>10
≤0.1	Maximum daily average[d]	°C	9.3	9.7	10.1	13.1	16.8
>0.1 ≤ 0.5			9.3	9.4	9.5	10.1	10.8
>0.5 ≤1.5			9.3	9.3	9.4	9.6	9.8
>1.5 ≤3			9.3	9.3	9.3	9.4	9.6
>3 ≤6.8			9.3	9.3	9.3	9.3	9.4
>6.8[c]			9.3	9.3	9.3	9.3	9.3

a. TMDL temperature effluent limit equation:

$$Effluent\ temperature\ (°C) = \frac{\left[\left(Effluent\ Flow + (0.25\ \times river\ flow)\right) \times (9°C + 0.3°C)\right] - \left[(0.25\ \times River\ Flow) \times 9°C\right]}{Effluent\ Flow}$$

b. This effluent limit is subject to a compliance schedule as described in Section 3.1.

c. The maximum design flow (in cfs) is calculated from the maximum design peak day flow of 4.41 mgd. The design maximum month design flow of 0.88 mgd was used in all other calculations. This table includes effluent peak flow magnitudes but does not authorize discharge above the engineered monthly average design flow.

d. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at 60-minute 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: maximum daily average.

Table 11. TMDL Temperature effluent limits[a,b] for the Grangeville WWTP (July 15 through September 15)

Threemile Creek Discharge (cfs)	Effluent Limit Type	Units	Grangeville Effluent Discharge (cfs)				
			≤0.5	>0.5 ≤1	>1 ≤5	>5 ≤10	>10
≤0.1	Maximum daily average [d]	°C	19.3	19.7	20.1	23.1	26.8
>0.1 ≤ 0.5			19.3	19.4	19.5	20.1	20.8
>0.5 ≤1.5			19.3	19.3	19.4	19.6	19.8
>1.5 ≤3			19.3	19.3	19.3	19.4	19.6
>3 ≤6.8			19.3	19.3	19.3	19.4	19.4
>6.8[c]			19.3	19.3	19.3	19.3	19.3

a. TMDL temperature effluent limit equation:

$$Effluent\ temperature\ (°C) = \frac{\left[\left(Effluent\ Flow + (0.25\ \times river\ flow)\right) \times (19°C + 0.3°C)\right] - \left[(0.25\ \times River\ Flow) \times 19°C\right]}{Effluent\ Flow}$$

b. This effluent limit is subject to a compliance schedule as described in Section 3.1.

c. The maximum design flow (in cfs) is calculated from the maximum design peak day flow of 4.41 mgd. The design maximum month design flow of 0.88 mgd was used in all other calculations. This table includes effluent peak flow magnitudes but does not authorize discharge above the engineered monthly average design flow.

d. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at 60-minute 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: maximum daily average.

3.1 Basis for effluent limits

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

Technology-based limits (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).

Water quality-based limits (WQBELs) are calculated so the effluent will comply with the Surface Water Quality Standards (IDAPA 58.1.02) or the National Toxics Rule (40 CFR 131.36) applicable to the receiving water.

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

3.2 Technology-Based Effluent Limits

IDAPA 58.01.25.302 requires that IPDES permits include TBELs and standards, while 40 CFR 125.3(a)(1) 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 12 below.

Table 12. 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.	

3.2.1 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[3]

Since the design flow for this facility is 0.88 mgd, the technology based mass limits for:

BOD_5:

Average Monthly Limit = 30 mg/l × 0.88 mgd × 8.34 = 220 lbs/day

Average Weekly Limit = 45 mg/l × 0.88 mgd × 8.34 = 330 lbs/day

TSS:

Average Monthly Limit = 30 mg/l × 0.88 mgd × 8.34 = 220 lbs/day

Average Weekly Limit = 45 mg/l × 0.88 mgd × 8.34 = 330 lbs/day

3.3 Water Quality-Based Effluent Limits

3.3.1 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 water quality standards (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 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 nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that 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.

3.3.2 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 criterion, there is reasonable potential, and a WQBEL must be included in the permit.

[3] 8.34 is a conversion factor with units (lb ×L)/(mg × (10^6 gallon))

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. Because the design effluent flow is much larger than the receiving water flow at critical conditions (1.05 dilution factor when using 25% of the crucial flow for the 1Q10), a mixing zone could not be authorized for ammonia and chlorine that would comply with IDAPA 58.01.02.060.01.h.i. A 25% mixing zone for temperature was included in TMDL and summer WQBEL driven limits. As stated in IDAPA 58.01.02.060.01.h, "the Department may authorize mixing zones that vary from the restrictions." The Department is authorizing the potential for a greater than 25% mixing zone width for temperature, as that is how the TMDL limit was written, and temperature is a non-conservative pollutant.

The proposed mixing zones for this facility's pollutants are summarized in Table 13. The calculated limits based on the size of the mixing zones do not impede receiving water beneficial uses.

Table 13. Authorized mixing zones for City of Grangeville WWTP.

Pollutant	Discharge Period	Authorized Mixing Zone (% of Critical Low Flow)			
		Aquatic Life		Human Health	
		Acute (1Q10)	Chronic (Ammonia - 30Q5) (TRC – 7Q10)	Water and Fish (30Q5 or Harmonic Mean)	Fish Only (30Q5 or Harmonic Mean)
Temperature	June 1 – July 14	25% of 0.15 cfs	25% of 0.17 cfs	N/A	N/A

DEQ also calculated dilution factors for seasonal critical low flow conditions. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.88 mgd (IDAPA 58.01.02.060.01.c).

The RPA and WQBEL calculations were based on mixing zones shown in Table 13. The temperature TMDL equation incorporates a 25% mixing zone based on 25% of the receiving water flow. 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.

3.3.3 Reasonable Potential and Water Quality-Based Effluent Limits

The reasonable potential and WQBELs for specific parameters are summarized below. The calculations are provided in Appendix B.

3.3.3.1 Total Ammonia (as N)

Ammonia criteria are based on a formula that relies on the pH and temperature of the receiving water. Because the fraction of ammonia present as the toxic, un-ionized form increases with

increasing pH and temperature, the criteria become more stringent as pH and temperature increase. The table below details the equations used to determine WQC for ammonia.

Table 14. Ammonia criteria.

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

INPUT	
1. Receiving Water Temperature (deg C):	19.6
2. Receiving Water pH:	6.80
3. Is the receiving water a cold water designated us	Yes
4. Are non-salmonid early life stages present or abs	Present
OUTPUT	
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**28.05**
Chronic Criterion (CCC)	**4.54**

Acute Criteria Equation: Cold Water

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

Acute Criteria Equation: Warm Water

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

Chronic Criteria: Cold Water, Early Life Stages Present

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

Chronic Criteria: Cold Water, Early Life Stages Absent

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

The low magnitude of critical flows, Table 6, does not allow for significant dilution. A 25% mixing zone was not authorized for ammonia as N. The effluent magnitude is considerably larger than critical flows. The acute criterion is limiting for ammonia as demonstrated in Appendix B.

See Appendix B for reasonable potential and effluent limit calculations for total ammonia (as N). RPTE ammonia criteria existed, and limits are necessary.

DEQ's *Effluent Limit Development Guidance* (DEQ 2017) states that DEQ will use the 90th to 95th percentile of the ambient upstream receiving water temperature and pH to calculate ammonia criteria. Because the Threemile Creek is impaired for temperature, DEQ determined that the 95th percentile temperature and pH were appropriate for the ammonia calculation.

The ammonia limits are new and no mixing zone is authorized, thus a compliance schedule and interim limits have been included in the permit. The facility previously sampled ammonia once per month, so the facility's 95th percentile of data from January 2013 to January 2020 (6.1 mg/L) is the average monthly interim limit. The corresponding 95th percentile MDL was back-calculated (19 mg/L) using ELDG and TSD equations given the AML value, the historic data set's CV of 1.97, and a sampling frequency of once a week. See Table 26 for calculations of interim limits and section 3.1 of the permit for the ammonia compliance schedule.

3.3.3.2 Total Residual Chlorine

The Idaho WQS 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. A reasonable potential analysis (RPA) showed that the discharge from the facility does not have reasonable potential to exceed WQS. The AML remains 0.007 mg/L and the MDL is 0.018 mg/L. For explanation on why the limits are retained see section 3.6.2 on antibacksliding. See Appendix B for the reasonable potential and effluent limit calculations for chlorine.

3.3.3.3 Dissolved Oxygen

Threemile Creek is impaired for DO, and the TMDL prescribes Idaho standard for cold water aquatic life as the effluent limit. The standard states (IDAPA 58.01.02.250.02):

Waters designated for cold water aquatic life are not to vary from the following characteristics due to human activities:

a. Dissolved oxygen concentrations exceeding 6 mg/L at all times.

Waters designated for salmonid spawning, in areas used for spawning and during the time spawning and incubation occurs, are not to vary from the following characteristics due to human activities:

(1) Intergravel dissolved oxygen

(a) One (1) day minimum of not less than five point zero (5.0) mg/L.

(b) Seven day average mean of not less than six point zero (6.0) mg/L.

(2) Water Column dissolved oxygen

(a) One (1) day minimum of not less than six point zero (6.0) mg/L or ninety percent (90%) of saturation, whichever is greater

The South Fork Clearwater TMDL states "The phosphorus TMDL is expected to result in compliance with the numeric dissolved oxygen standard as well as the narrative nutrient criteria" (DEQ 2004, page xxvii). Because the phosphorus seasonal limit is included in this permit, only DO monitoring in the effluent and receiving water is included.

The reasonable potential to cause or contribute to violations of the dissolved oxygen criteria of 6 mg/L can be evaluated using the Streeter-Phelps model (See Table 27). The Streeter-Phelps equation (also known as the "dissolved oxygen sag" equation) is based on a mass balance which is affected by two processes. One is that oxygen is removed from water by the degradation of organic materials. In other words, the biochemical oxygen demand of an organic waste is satisfied by oxygen taken from the water. The second process is "reaeration" by oxygen transfer into the water from the atmosphere.

The analysis was done based on the lowest 5th percentile of effluent and receiving water DO data, and the worst case effluent of the facility for all other parameters. The effluent temperature was assumed to be the CWAL maximum temperature of 22°C. The model shows that the minimum downstream DO will be 6.06 mg/L, and therefore the discharge is unlikely to contribute to a violation of DO criteria. An estimated worst case was used for input data into the model based on best available information.

3.3.3.4 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. Therefore, the permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho 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 secondary contact recreation, the single sample maximum value is 576 organisms per 100 mL (IDAPA 58.01.02.251.01.b.ii.). The South Fork Clearwater TMDL has designated Threemile Creek impaired for *E. coli*, and given a TMDL WLA of 576 organisms per 100mL. Exceedance of this value indicates likely exceedance of the 126 #/100 mL average monthly effluent limit. When a single sample maximum is exceeded,

additional samples should be taken to assess compliance with the geometric mean criterion. Weekly monitoring of the effluent will ensure compliance with the criterion can be assessed. If the single sample maximum is exceeded, the permittee may choose to monitor more frequently to ensure 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 58.01.25.10.06 and 07 respectively as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean.

3.3.3.5 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.

3.3.3.6 Temperature

Threemile Creek is impaired for temperature, and the TMDL prescribes an effluent limit dependent on a function of effluent flow in cubic feet per second (cfs) and receiving water discharge in cfs (Section 3.0, Table 10[4], Table 11[5]). The WWTP cannot immediately meet temperature limits. Performance-based interim limits have been set using the 95th percentile of available historic effluent temperature from 2004 to 2017.

The South Fork Clearwater River TMDL (March 2004) refers to the temperature limit statistical basis as both "maximum daily" and "maximum daily average." The limits are derived from the WQS temperature criteria for cold water aquatic life (CWAL) and salmonid spawning (SS). Temperature criteria in IDAPA 58.01.02.250.02.b and 58.01.02.250.02.f.ii are maximum daily averages, as are the limits in the permit.

The South Fork Clearwater River TMDL prescribes temperature limits for April 1 through May 31 and July 15 through September 15. RPA was conducted for the summer time period in between the TMDL prescribed limit (June 1 through July 14) and the longer timer period during winter months (September 16 through March 30). RPA was conducted using the RPA work book (Table 24), and the warmer time period between the TMDL prescribed limits had reasonable potential do cause or contribute to a temperature water quality exceedance. The longer time period during winter months had no RPA, thus limits were not calculated. The longer, winter time period was not authorized a mixing zone for temperature. This more conservative assumption was made because critical low flows potentially happen during this time period and critical low flows in Section 2.2.2 were estimated, not direct measurements. If flow monitoring is

[4] $Effluent\ temperature\ (°C) = \frac{[(Effluent\ Flow + (0.25 \times river\ flow)) \times (9+0.3)] - [(0.25 \times River\ Flow) \times 9]}{Effluent\ Flow}$

[5] $Effluent\ temperature\ (°C) = \frac{[(Effluent\ Flow\ \ (0.25 \times river\ flow)) \times (19+0.3)] - [(0.25 \times River\ Flow) \times 19]}{Effluent\ Flow}$

conducted year-round for 5 years a mixing zone may be authorized for September 16 – March 30 in a future permit.

Limits for June 1 through July 14 were calculated using the method prescribed in Section 3.7.2.4 of DEQ's Effluent Limit Development Guidance (DEQ 2017). See Table 28 for limit calculation data. Note that 0.3 °C was added to the criteria in accordance with 58.01.02.401.01.c. The WWTP cannot immediately meet temperature limits. Performance-based interim limits have been set using the 95th percentile of available historic effluent temperature from 2004 to 2017.

3.3.3.7 Total Phosphorus

Total phosphorus has no numeric criteria; however, dischargers are required to meet narrative criteria in IDAPA 58.01.02.200.

Threemile Creek is impaired for TP, and the TMDL prescribes a seasonal WLA of 0.22 kg/day (0.49 lb/day) for the City. The permit includes the seasonal WLA as a monthly load limit as the TMDL states "[t]hese limits are expected to be incorporated into the Grangeville NPDES permit when it is reissued, as monthly average limits" (page 158, DEQ 2004). Implementing the TP TMDL as a monthly limit is more conservative than implementing the TMDL as a seasonal limit, thus a seasonal limit for TP was not included in this permit.

3.4 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 limit prohibiting the discharge of such materials.

3.5 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 DEQ 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).

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

A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing 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 *South Fork Clearwater River Subbasin Assessment and TMDLs* (March 2004) establishes wasteload allocations for TSS, E. coli, total phosphorus, dissolved oxygen, and temperature. The effluent limits and associated requirements contained in the City of Grangeville WWTP permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the *South Fork Clearwater River Subbasin Assessment and TMDLs*. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Threemile Creek in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

3.5.2 High-Quality Waters (Tier II Protection)

The Threemile Creek cold water aquatic life, salmonid spawning, and secondary contact recreation uses are all impaired. No uses on Threemile Creek have Tier II protection.

3.6 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 previous 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 proposed in this permit with the 2005 permit. An antibacksliding analysis was done for the total ammonia (as N), TRC, temperature, and total phosphorus (as P). All other permit limits in this permit do not deviate from the 2005 permit. The analysis for each of these parameters is detailed below.

Table 15. Comparison of 2005 and 2020 permit limits for pollutants of concern.

Pollutant	Units	2005 Permit			2020 Permit			Degradation[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 2005 and 2020 permit								
BOD	mg/L	30	45	—	30	45	—	No
	lb/day	220	330	—	220	330	—	
TSS	mg/L	30	45	—	30	45	—	No
	lb/day	220	330	—	220	330	—	
E. coli	#/100 mL	126	—	576	126	—	576	No
pH	s.u.	Between 6.5–9.0			Between 6.5–9.0			No
Total Residual Chlorine (TRC)	mg/L	0.007	—	0.018	0.007	—	0.018	No
	lb/day	0.066	—	0.13	0.051	—	0.13	
Total Phosphorus (as P) (TP) (July 1-Sept 15)	mg/L	0.067	—	—	Report	—	—	No[b]
	lb/day	0.49	—	—	0.49			
Pollutants with new limits in the 2020 permit								
Temperature	C	—	—	—	See Table 10 & Table 11			No
Temperature	C	—	—	—	20.0 (daily avg.) & 23.1 (instant. max)			No
Total Ammonia (as N)	mg/L	—	—	—	3.6	—	18	No
	lb/day	—	—	—	26	—	133	
Pollutants with no limits in both the 2005 and 2020 permit								
Dissolved oxygen	mg/L	—	—	Report	—	—	Report	No
Total Inorganic Nitrogen	mg/L	—	—	Report	Report	—	—	No
Nitrate + Nitrate (as N)	mg/L	—	—	—	Report	—	—	No

[a] No = No degradation, Yes - S = Increase in pollutant load or concentration resulting in significant degradation, Yes – I = Increase in pollutant load or concentration resulting in insignificant degradation.
[b] See section 3.6.4 for discussion.

3.6.1 Total Ammonia (as N)

The 2005 permit did not include an ammonia limit due to lack of data. The new effluent limits are more stringent than the 2005 permit, therefore, antibacksliding does not apply to these new limits.

3.6.2 Total Residual Chlorine

The 2005 permit included an AML and MDL for chlorine (0.007 mg/L and 0.018 mg/L, respectively). The average monthly load for TRC was calculated to be more stringent than the 2005 permit load, despite the design flow and concentration remaining the same.

3.6.3 Temperature

In the case of temperature, the TMDL WLAs and RPA calculations provide limits the permittee must meet. The 2005 permit did not include temperature limits, and therefore, antibacksliding does not apply to these new limits.

3.6.4 Total Phosphorus (as P)

In the case of TP, the TMDL WLAs provide the seasonal limits the permittee must meet. This WLA is an average allocation for a specified season (July 1 to September 15). Permit limits based on WLAs should be expressed in a manner consistent with these averaging periods, however, the TMDL directs the use of the TP TMDL as a monthly load limit.

The 2005 permit converted the TMDL WLA to a concentration, which was not explicitly stated in the TMDL and does not apply to nutrients (DEQ 2017). The effluent concentration will be reported as a condition in the permit; however, the limit was removed. Antibacksliding is not occurring with the removal of the concentration limit, as it is a correction of the implementation of the TMDL.

3.6.5 E. coli

The *E. coli* instantaneous maximum limit from the 2005 permit has not been removed because of the secondary contact recreation use impairment. Idaho's water quality standards for secondary contact recreation include a single sample maximum value of 576 #/100 mL. Exceedance of this value indicates likely exceedance of the 126 #/100 mL geometric mean effluent limit.

The single sample maximum value of 576 #/100mL is a single sample maximum value trigger specified in IDAPA 58.01.02.251.01.b, and never meant to be the limit; however; antibacksliding prohibits the removal of the limit from an impaired water body.

4 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.

4.1 Influent Monitoring

Flow, TSS, BOD_5, and hauled waste monitoring requirements are listed below in Table 16. 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 16. Influent monitoring requirements

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow	01/01 to 12/31	mgd	1/day	Recording	Monthly average	Monthly
BOD_5	01/01 to 12/31	mg/L	1/week	8-hour composite	Monthly average	Monthly
TSS	01/01 to 12/31	mg/L	1/week	8-hour composite	Monthly average	Monthly
Hauled waste received (portable toilet septage)	01/01 to 12/31	Gallons	1/month	Recording	Total monthly	Monthly

4.1.1 Influent Monitoring Changes from the 2005 Permit

Monitoring frequency for influent parameters have been changed relative to the 2005 permit. Changes in monitoring are presented in Table 17, below.

Table 17. Changes in Influent monitoring frequency from 2005 permit.

Parameter	2005 Permit	2020 Permit	Rationale
Flow	—	1/day	Allows for monitoring of I&I
BOD_5	1/month	1/week	Reflect effluent sampling frequency
TSS	1/month	1/week	Reflect effluent sampling frequency
Hauled waste received	—	1/month	Records of frequency and amount of hauled waste should be retained at the WWTP

4.2 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.

Pollutants that must be monitored but do not have effluent limits are presented in Table 18. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 18. Additional Effluent Monitoring.

Parameter	Monitoring Period	Units	Monthly Average	Daily Maximum	Instant-aneous Maximum	Instant-aneous Minimum	Sample Frequency	Sample Type	Reporting Period (DMR Months)
Flow	01/01 to 12/31	mgd	Report	Report	—	—	Continuous[a]	Recording	Monthly (All months)
Temperature	01/01 to 12/31	°C	—	—	Report	—	Continuous[a, b, c, d]	Recording	Monthly (All months)
Total Phosphorus (TP)	07/01 to 09/15	mg/L	Report	Report	—	—	2/month	8-hour composite	Monthly (July, August, & September)
Total Inorganic Nitrogen (TIN)	01/01 to 12/31	mg/L	Report	Report	—	—	1/month	8-hour composite	Monthly (All months)
Nitrate + Nitrite (as N)	01/01 to 12/31	mg/L	Report	Report	—	—	1/month	8-hour composite	Monthly (All months)
Dissolved Oxygen	01/01 to 12/31	mg/L	—	—	—	Report	1/month	Grab[e]	Monthly (All months)

a. 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.
b. 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: maximum daily average.
c. 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 should 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.
d. 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.
e. A grab sample is an individual sample collected over a 15-minute period or less.

4.1.1 Monitoring Changes from the 2005 Permit

Monitoring frequency increased for BOD_5, TSS, pH, TP, ammonia, nitrate + nitrite (as N), and temperature relative to the previous permit. Only chlorine monitoring frequency decreased. Changes in monitoring are presented in Table 19, below; the changes are based on facility upgrades, RPTE, and TMDL development for Threemile Creek.

Table 19. Changes in monitoring frequency from 2005 permit.

Parameter	2005 Permit	2020 Permit	Rationale
BOD_5	1/month	1/week	More frequent monitoring allows compliance determination for monthly, weekly, and daily effluent limits.
TSS	1/month	1/week	
pH	1/week	1/day	
Total Phosphorus	1/month	2/month	
Total Residual Chlorine	5/week	1/week	The Facility has updated chlorination and dechlorination methods since the last permit
Total Ammonia (as N)	1/month	1/week	Ammonia has RPTE WQS and new effluent limits, thus more frequent monitoring is prescribed
Temperature	1/month	Continuous	Temperature has new effluent limits, thus more frequent monitoring is prescribed
Total Inorganic Nitrogen	1/month	1/month	TMDL 5-year review will evaluate the need for a nitrogen target
Nitrate + Nitrate (as N)	—	1/month	TMDL 5-year review will evaluate the need for a nitrogen target

4.3 Receiving Water Monitoring

Table 20 presents the proposed receiving water monitoring requirements for the 2020 permit. The City of Grangeville WWTP should continue receiving water monitoring at the DEQ approved location. Receiving water monitoring results must be submitted with the DMR.

The monitoring location of receiving water flow and temperature may be different than the other parameters. If the placement is flow and temperature monitoring is different from other parameters, please include the rationale for the location in the approval request.

Table 20. Receiving water monitoring requirements.

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow[a, b]	04/01 to 09/30	cfs	5/week	Measurement	Monthly Average, Daily Minimum	Monthly (April to September)
Temperature [b]	01/01 to 12/31	°C	5/week	Grab[c]	Daily Maximum, Average Monthly	Monthly (All months)
Dissolved Oxygen	01/01 to 12/31	mg/L	1/month	Grab	Instantaneous Minimum	
Total Ammonia (as N)[c]	01/01 to 12/31	mg/L	1/quarter[d]	Grab	Daily Maximum, Monthly Average	Quarterly (March, June, September, December)
Total Inorganic Nitrogen	01/01 to 12/31	mg/L	1/quarter[d]	Grab	Daily Maximum, Monthly Average	
Nitrate plus Nitrite as N	01/01 to 12/31	mg/L	1/quarter[d]	Grab	Daily Maximum, Monthly Average	
pH	01/01 to 12/31	s.u.	1/quarter[d]	Recorded or Grab[c]	Daily Maximum, Daily Minimum	
Total Phosphorus	01/01 to 12/31	mg/L	1/quarter[d]	Grab	Daily Maximum, Monthly Average	

a. Upstream receiving water flow must be measured on the same day as temperature.
b. Monitoring of this parameter is not required until 07/01/2020
c. pH and temperature must be analyzed within 15 minutes of sample collection. Temperature must be collected during the hottest part of the day.
d. Quarters are defined as: January 1-March 31; April 1-June 30; July 1-September 30; and October 1-December 31.
e. Temperature and pH must be analyzed concurrently with the ammonia sample.

4.3.1 Receiving Water Monitoring Changes from the 2005 Permit

Monitoring parameters have been changed relative to the 2005 permit. Changes in monitoring are presented in Table 21, below.

Table 21. Changes in Receiving Water monitoring frequency from 2005 permit.

Parameter	2005 Permit	2020 Permit	Rationale
Flow	—	5/week	Upstream flow is necessary to calculate the temperature effluent limit
Temperature	1/quarter	5/week	Receiving water is impaired for temperature
Total Ammonia (as N)	1/quarter	1/quarter	Necessary for future reasonable potential calculations
pH	1/quarter	1/quarter	Accompanies total ammonia (as N) reasonable potential analyses
Total Phosphorus (as P)	1/quarter	1/quarter	Receiving water is impaired for nutrients
Total Inorganic Nitrogen	1/quarter	1/quarter	TMDL nutrient review will evaluate a need for a nutrient target
Nitrate plus Nitrate	1/quarter	1/quarter	TMDL nutrient review will evaluate a need for a nutrient target
Dissolved oxygen	1/quarter	1/month	Receiving water is impaired for dissolved oxygen

4.4 Permit Renewal Monitoring

The permit renewal monitoring requires data collected to characterize the effect of the effluent on Threemile Creek. At a minimum, three scans of the final wastewater effluent for the parameters listed in Table 22 and Table 23 are required so that DEQ can assess the surface water impacts.

Table 22. Effluent monitoring required for all permit renewals.

Parameter	Units	Sample Type	Report
pH	s.u.	Grab	Minimum and maximum value
Flow	mgd	Continuous	Maximum daily value, average daily value, number of samples
Temperature	°C	Grab	
BOD_5	mg/L	24-hour composite	Maximum daily value, average daily value, analytical method and ML or MDL
TSS	mg/L	24-hour composite	
E. Coli	#/100 mL	Grab	

The facility has a design flow greater than 0.1 mgd and must also complete three scans of effluent testing for the parameters in Table 23.

Table 23. Effluent testing required for permit renewals of facilities with flow greater than 0.1 mgd.

Parameter	Units	Sample Type[a]	Report
Total Ammonia (as N)	mg/L	24-hour composite	Maximum daily value, average daily value, analytical method and ML or MDL
Chlorine, Total Residual	mg/L	Grab	
Dissolved oxygen	mg/L	Grab	
Total Kjeldahl Nitrogen	mg/L	24-hour composite	
Nitrate plus Nitrite	mg/L	24-hour composite	
Oil and grease	mg/L	Grab	
Phosphorus, Total (as P)	mg/L	24-hour composite	
Total dissolved solids	mg/L	24-hour composite	

a. Unless specified otherwise at 40 CFR Part 136.

An individual scan includes all parameters in Table 22 and Table 23. For parameters in which a grab sample must be collected, each scan consists of a minimum of four grab samples, analyzed individually. For parameters requiring a 24-hour composite sample, only one analysis of the composite of aliquots is required for each scan.

The permittee must conduct one permit renewal monitoring scan of the effluent according to the following schedule:

- 2022: First quarter (March)
- 2023: Second quarter (June)
- 2024: Third quarter (September)

The permittee must continue to conduct permit renewal sampling in Table 10 and Table 11 every five quarters after the September 2024 sampling event (e.g. December 2025, March 2027, June 2028, etc.).

5 Special Conditions

5.1 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 proposed permit also includes a compliance schedule for temperature. A time period of five years is given to evaluate how the permittee will approach the temperature limit (upgrades, shade, trading, re-use, variance, etc.). After an approach is decided, the permittee will have another year to provide DEQ a schedule in which to implement their plan. Following receipt of the plan, DEQ will have one year to review and approve the plan. The facility will have the remaining 14 years to implement their plan (e.g., receiving upgrade bids, construction, negotiate with upstream landowners for shade trading, etc.). Additional specific compliance schedule tasks may be added in future permit cycles once the permittee has chosen the approach to meet final limits.

The proposed permit also includes a compliance schedule for total ammonia. One year allocated to evaluate how the permittee will approach the ammonia limit (upgrades, integrated planning, re-use, etc.). After an approach is decided, the permittee will have another year to provide DEQ a schedule in which to implement their plan. Following receipt of the plan, DEQ will have one year to review and approve the plan, and work with the permittee on any plan modifications. The facility will have the remaining 5 years to implement their plan (e.g., receiving upgrade bids, construction, etc.). Additional specific compliance schedule tasks may be added in future permit cycles once the permittee has chosen the approach to meet final limits.

Compliance schedules and applicable dates may be modified when a final plan and schedule for meeting effluent limits has been submitted to DEQ.

5.2 Facility Capacity

The influent and effluent monitoring section of the permit includes monitoring for flow. If the reported values exceed a facility capacity value as stated in section 3.2 of the permit for any 2 months during a 12-month period, the permittee must assess whether an update to the facility plan is necessary. The average monthly flow value was reported in the permit application. All other values were taken from existing facility capacity values reported in a 2011 facility improvements bid.

5.3 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 wastes 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, or otherwise be incompatible with operation of the wastewater treatment works, including interference with the use or disposal of municipal sludge.

5.4 Inflow and Infiltration Evaluation

The permittee has been addressing inflow and infiltration (I&I) each year. The evaluation required by the permit will document progress toward eliminating excessive I&I.

6 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.

6.1.1 Quality Assurance Project Plan

In accordance with IDAPA 58.01.25.300.05, permittees are 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 update and implement a plan. The quality assurance plan 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.

6.1.2 Operation and Maintenance Manual

The permit requires City of Grangeville WWTP 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 or update and implement an operation and maintenance plan for their facility. The plan must be retained on site and made available to DEQ upon request.

6.1.3 Emergency Response Plan

The permittee must maintain 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.

7 Compliance with other DEQ Rules

7.1 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.

7.2 Lagoon Seepage Testing

The permittee must comply with the "Wastewater Rules" in IDAPA 58.01.16, including the seepage testing requirements in IDAPA 58.01.16.493 for municipal lagoons. Prior to lagoon seepage testing, the permittee must consult DEQ. The seepage test report submittals to DEQ must be up-to-date per the IDAPA 58.01.16 timelines.

7.3 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 requires 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 58.01.016.650). Operations of these sludge processing, storage, and disposal activities must comply with the facility's sludge management plan.

8 Permit Expiration or Modification

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.

9 References for Text and Appendices

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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*

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Appendix A. Facility Maps / Process Schematics

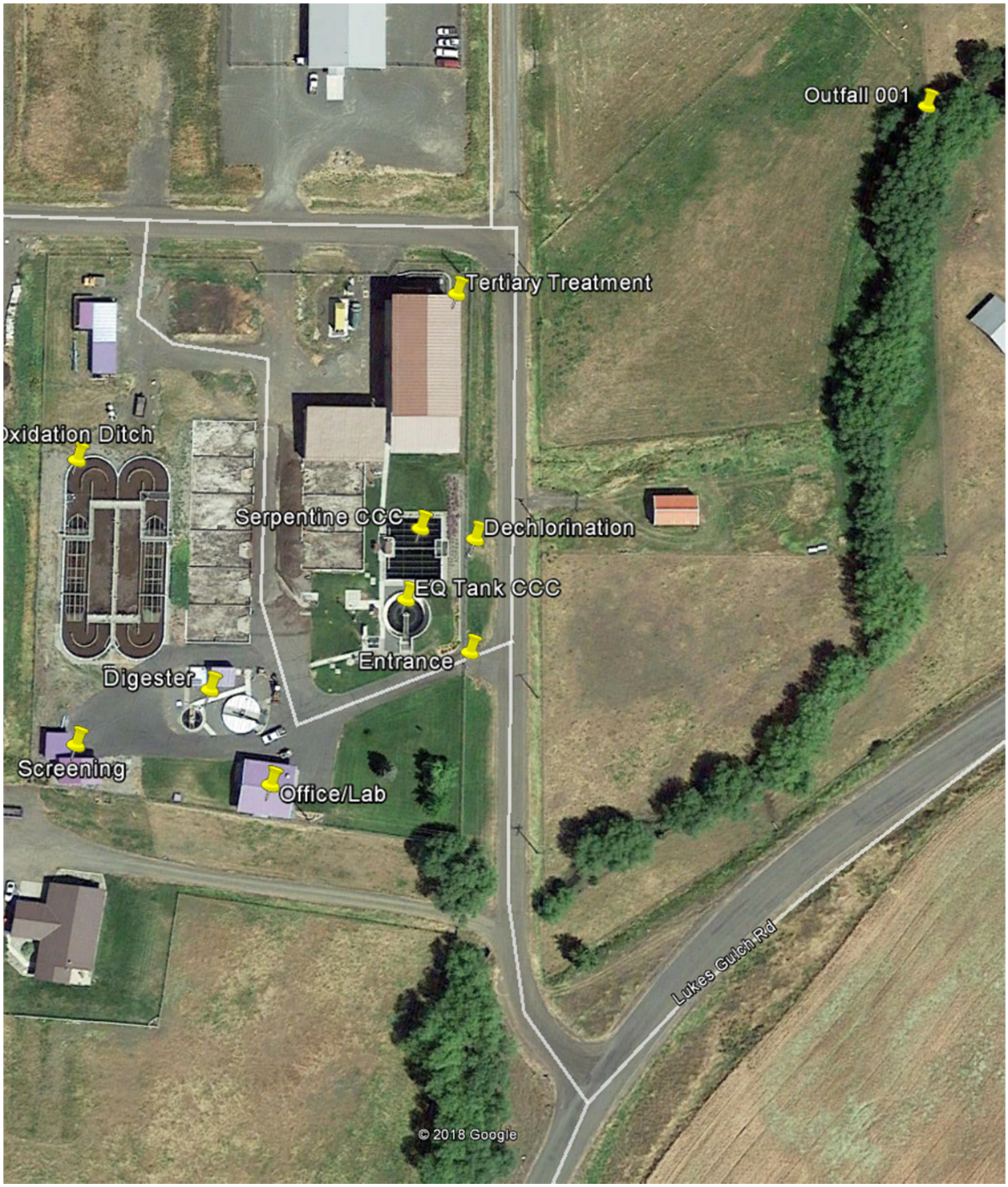

Figure 1: Aerial map of the Grangeville Wastewater Treatment Plant

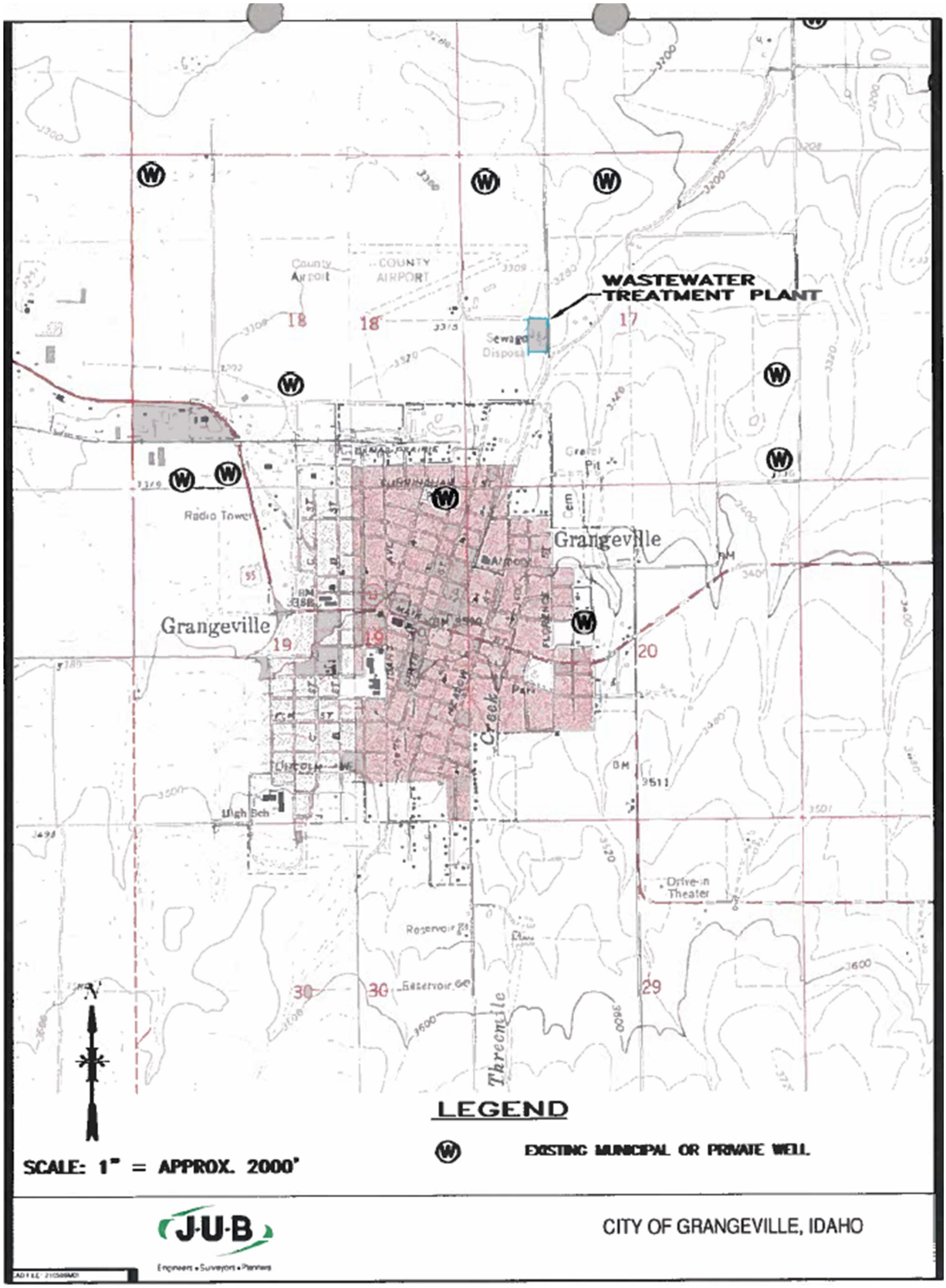

Figure 2: Topographic map of the Grangeville Wastewater Treatment Plant

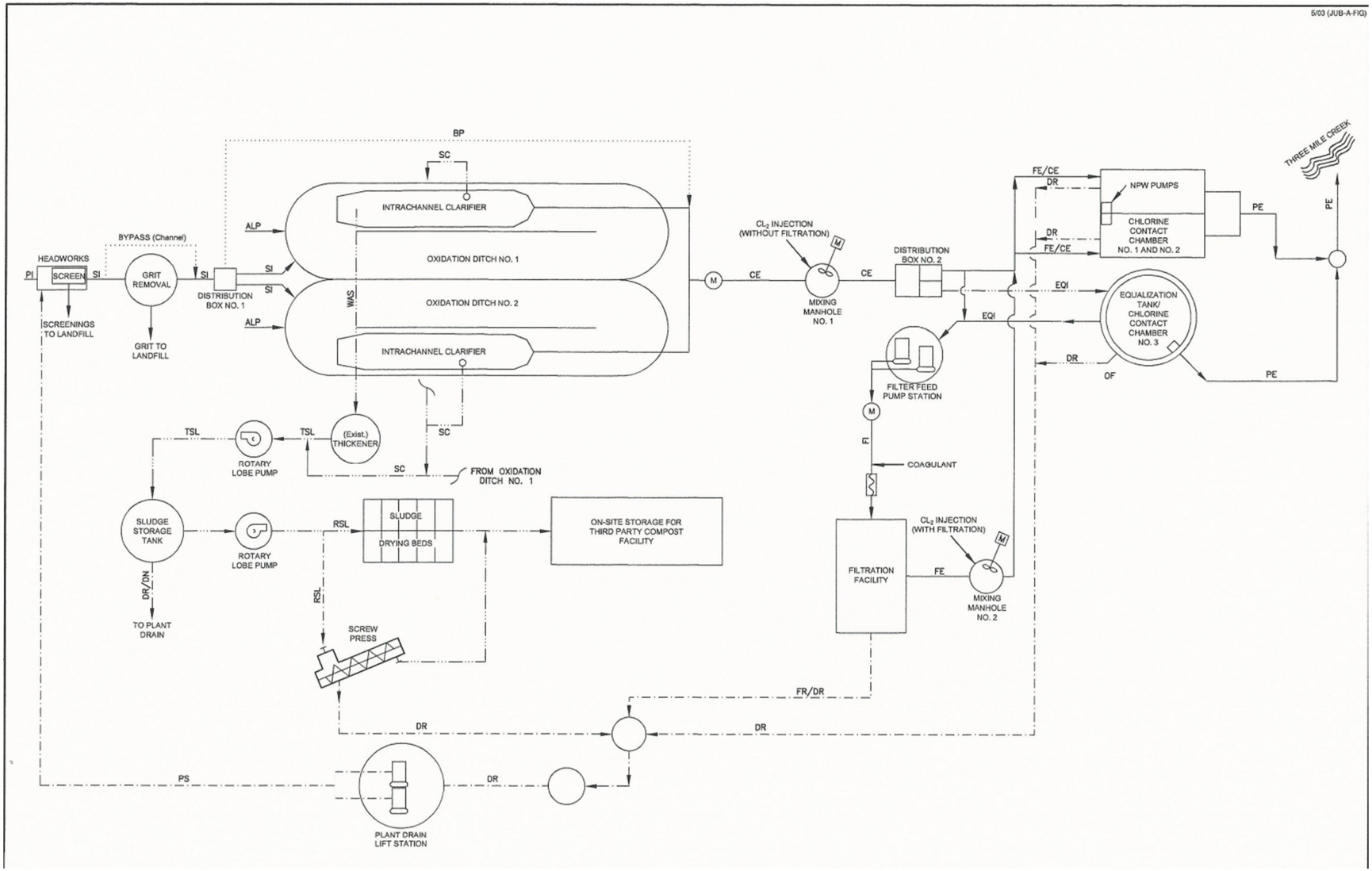

Figure 3: Process schematic of the Grangeville Wastewater Treatment Plant

Appendix B. Technical Calculations

The results of the technical calculations are discussed above in sections 3.2 and 3.3 of the fact sheet.

A. Technology-Based Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as secondary treatment, which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated secondary treatment effluent 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 and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. As explained in Section 3.3.3, DEQ has determined that more-stringent water quality-based effluent limits are necessary for pH, *E. coli*, TRC, temperature, , total ammonia (as N), and total phosphorus (as P), in order to ensure compliance with water quality standards

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 waste load allocations.

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 3, 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.

Reasonable Potential Analysis

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria, 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 WQ criterion 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 pollutant of concern does not have acute toxicity attributes. Other conditions may also be applicable that may restrict the use of a mixing zone for the pollutant of concern.

C. WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the permit were calculated. The permit includes WQBELs for TSS, pH, *E. coli*, TRC, total ammonia (as N), temperature, and TP. The following discussion presents the general equations used to calculate the WQBELs.

Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the mixing zone boundary in the reasonable potential analysis. WLA must be calculated for both acute and chronic criteria. To calculate the wasteload allocations, 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 5is 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 5

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 waste load allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator. As 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.

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

Equation 6. 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 5
CT= Criteria translator	Conversion factors or site specific translators

The next step is to compute the acute and chronic long term average ($LTA_{(a\ or\ c)}$) 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 1. 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
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 2. 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 3. Maximum daily limit for toxics.**

Where:

LTA_m = Minimum long-term average value	Lesser value calculated from Equation 1 and Equation 2
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 4. Average monthly limit for toxics.**

Where:

LTA_m = Minimum long-term average	Lesser value calculated from Equation 1 and Equation 2
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	Equation 3

Table 24 details the calculations for water quality-based effluent limits.

Table 24. City of Grangeville RPA

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

Facility Name	Grangeville WWTP
Facility Flow (mgd)	0.88
Facility Flow (cfs)	1.36

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	0.15	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	0.17	cfs
Ammonia	**30B3/30Q10** (seasonal)		cfs
Human Health - Non-Carcinogen	**30Q5**	0.28	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		min. hardness 25 mg/L except for Cadmium.
Temperature, °C	Temperature, °C	90th - 95th percentile	19.6	95th percentile
pH, S.U.	pH, S.U.	90th - 95th percentile	6.8	95th percentile

Pollutants of Concern			2013-2019 Data AMMONIA, default: cold water, fish early life stages	CHLORINE (Total Residual)	June 1 - July 14 Temperature (units in C)	Sept 16-March 3 Temprature (units in C)
Effluent Data	**Number of Samples in Data Set (n)**		76	1528	356	1900
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		1.9	4.6	0.12	0.28
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		6,075	10	21.2	19.0
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only					
Receiving Water Statistics	**90th Percentile Conc., µg/L - (C_e)**		210	0	20.32	12.9
	Geometric Mean, µg/L, Human Health Criteria Only					
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	28,046	19.	22.	22.
	Aquatic Life Criteria, µg/L	Chronic	4,536	11.	19.	19.
	Human Health Water and Organism, µg/L		--	--	--	--
	Human Health, Organism Only, µg/L		--	--	--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute		--	1.	1.
		Chronic		--	1.	1.
	Carcinogen (Y/N), Human Health Criteria Only		--	N	--	--
Assign Percent Mixing	Use this row to set the mixing zone size instead of letting it auto-calculate		0%		25%	0%
Percent River Flow	Aquatic Life - Acute	1Q10	0%	0%	25%	0%
	Aquatic Life - Chronic	7Q10 or 4B3		0%	25%	0%
		30B3 or 30Q10		--	25%	0%
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	0%	--	25%	0%
	Human Health - Carcinogen	Harmonic Mean		--	25%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	1.00	1.00	1.03	1.00
	Aquatic Life - Chronic	7Q10 or 4B3		1.00	1.03	1.00
		30B3 or 30Q10		--	1.00	1.00
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	1.00	--	1.05	1.00
	Human Health - Carcinogen	Harmonic Mean		--	1.00	1.00

Table 25. City of Grangeville RPA (continued)

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

Facility Name	Grangeville WWTP
Facility Flow (mgd)	0.88
Facility Flow (cfs)	1.36

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life – Acute Criteria – Criterion Max. Concentration (CMC)	**1Q10**	0.15	cfs
Aquatic Life – Chronic Criteria – Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	0.17	cfs
Ammonia	**30B3/30Q10** (seasonal)		cfs
Human Health – Non-Carcinogen	**30Q5**	0.28	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		min. hardness 25 mg/L except for Cadmium. C
Temperature, °C	Temperature, °C	90th – 95th percentile	19.6	95th percentile
pH, S.U.	pH, S.U.	90th – 95th percentile	6.8	95th percentile

Pollutants of Concern			2013–2019 Data AMMONIA, default: cold water, fish early life stages present	CHLORINE (Total Residual)	June 1 – July 14 Temperature (units in C)	Sept 16–March 31 Temprature (units in C)
Aquatic Life Reasonable Potential Analysis						
σ	$\sigma^2=\ln(CV^2+1)$		1.236	1.760	0.120	0.275
P_n	$=(1-\text{confidence level})^{1/n}$, where confidence level =	**99%**	0.941	0.997	0.987	0.998
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	**99%**	2.6	1.0	1.0	1.0
Statistically projected critical discharge concentration (C_e)			15571	10	21.44	19.0
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	15571	10	21.41	19.00
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	15571	10	21.41	19.00
Reasonable Potential to exceed Aquatic Life Criteria			**Yes**	**No**	**Yes**	**No**
Aquatic Life Effluent Limit Calculations						
Number of Compliance Samples Expected per month (n)			30			
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			30	--	--	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		1.9	4.6		
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		1.9	4.6		
Acute WLA, ug/L	$C_d=$ (Acute Criteria x MZ_a) – C_u x (MZ_a–1)	Acute	28,046	--	--	--
Chronic WLA, ug/L	$C_d=$ (Chronic Criteria x MZ_c) – C_{uc} x (MZ_c–1)	Chronic	4,536	11.0	--	--
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute	**99%**	3,394	--	--	--
(99th % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	**99%**	2,192	1.2	--	--
Limiting LTA, ug/L	used as basis for limits calculation		2,192	1.2	--	--
Applicable Metals Criteria Translator (metals limits as total recoverable)				--	--	--
Average Monthly Limit (AML), ug/L	, where % occurrence prob =	**95%**	**3,605**	--	--	--
Maximum Daily Limit (MDL), ug/L	, where % occurrence prob =	**99%**	**18,110**	--	--	--
Average Monthly Limit (AML), mg/L			**3.6**	--		
Maximum Daily Limit (MDL), mg/L			**18.1**	--		
Average Monthly Limit (AML), lb/day			**26**	--		
Maximum Daily Limit (MDL), lb/day			**133**	--		

Table 26. Total Ammonia Interim Limit Back-Calculation

TSD Calculation Worksheet

Hypothetical WLA:	16	lb/day
Facility Flow:	0.88	mgd
Design Flow:	9.9	cfs

Multiplier to Calculate Permit Limits from LTA

Reference: TSD Page 103

Number of Samples per Month (n)				4
Number of Samples per Week Set (n/4)				1
(i.e. 4 if sampling weekly for a month)				
Coefficient of Variation (CV) = Std. Dev./Mean				1.97 (Januray 2013 to January 2020)
weekly σ	σ = std deviation			1.259
	$\sigma^2=\ln(CV^2(n/4)+1)$			0.678
monthly σ	σ n= std deviation			0.823
	$\sigma n^2=\ln(CV^2/n+1)$			0.678
Average Monthly Limit (AML),	$\exp(z\sigma_n-0.5z\sigma_n^2)$; where %	95%	Z= 1.64	2.76
Maximum Daily Limit (MDL),	$\exp(z\sigma-0.5z\sigma^2)$; where % p	99%	Z= 2.33	8.47
Average Weekly Limit (AWL),	$\exp(z\sigma_{n/4}-0.5z\sigma_{n/4}^2)$; where	99%	Z= 2.33	8.47
Ratio AWL/AML				3.07

Calculation:	LTA, Limiting	x	Multiplier	=	Limit		Concentration	
AML = LTA, limiting x Multiplier	16.09	x	2.76	=	44	lb/day	6.1	mg/L
MDL = LTA, limiting x Multiplier	16.09	x	8.47	=	136	lb/day	19	mg/L
AWL = AML x Multiplier	44	x	3.07	=	NA	lb/day	NA	mg/L
AAL/AAS=					NA	lb/day	NA	mg/L

Table 27. Streeter-Phelps Dissolved Oxygen Reasonable Potential Analysis

Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag

INPUT		
1. EFFLUENT CHARACTERISTICS		
Discharge (cfs):	1.36136	
CBOD5 (mg/L):	16	Effluent Maximum
NBOD (mg/L):	27.99	Organic N Maximum
Dissolved Oxygen (mg/L):	5.8	Effluent 5th Percentile
Temperature (deg C):	22	CWAL Limit
2. RECEIVING WATER CHARACTERISTICS		
Upstream Discharge (cfs):	0.17	Low Flow 7Q10
Upstream CBOD5 (mg/L):	16.0	Assumed effluent worst case scenrio
Upstream NBOD (mg/L):	17	TMDL
Upstream Dissolved Oxygen (mg/L):	8.32	5th Percentile at Outfall
Upstream Temperature (deg C):	19.6	Maximum
Elevation (ft NGVD):	3400	Topo Map
Downstream Average Channel Slope (ft/ft):	0.017	
Downstream Average Channel Depth (ft):	0.75	Low Flow conditions
Downstream Average Channel Velocity (fps):	3	
3. REAERATION RATE (Base e) at 20 deg C (day^-1):	76.78	

Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	54.43
O'Connor and Dobbins	0.1 - 1.5	2 - 50	34.56
Owens	0.1 - 6	1 - 2	76.78
Tsivoglou-Wallace	0.1 - 6	0.1 - 2	352.23

4. BOD DECAY RATE (Base e) AT 20 deg C (day^-1):	2.51
(Suggested value = 2.51, *Wright and McDonnell, 1979*)	

OUTPUT	
1. INITIAL MIXED RIVER CONDITION	
CBOD5 (mg/L):	16.0
NBOD (mg/L):	26.8
Dissolved Oxygen (mg/L):	6.1
Temperature (deg C):	21.7
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day^-1):	80.00
BOD Decay (day^-1):	2.72
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	23.5
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	50.3
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	7.727
Initial Deficit (mg/L):	1.65
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	0.01
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	0.45
7. CRITICAL DO DEFICIT (mg/L):	1.67
8. CRITICAL DO CONCENTRATION (mg/L):	**6.06**

Table 28. Non-TMDL Temperature Limit Calculation

$Te = Dx \times (Td - Tr) + Tr$
Where: temperature (°C)
Te = Effluent temperature (°C)
Dx = Df = Dilution factor
Td = Water quality criterion (°C)
Tr = Receiving water body

Daily Average Limit		Instanteous Maximum	
Te (°C) =	21.1	Te (°C) =	21.1
Df =	1.03125	Df =	1.03125
Td (°C) =	19.3	Td (°C) =	22.3
Tr (°C) =	20.32	Tr (°C) =	20.32
Te =	20.0	Te =	23.1

Df = ([Qs x P)/Qe]+1
From ELDG Section 2.7.2.4
Where:
Qs = Receiving water low-flow design conditions (cfs)
P = Mixing zone percentage (25% may be used initially to determine the level of analysis required)
Qe = Discharge flow (in cubic feet per second)
Qs = 0.17
P = 0.25
Qe = 1.36
Df = 1.03125

n effluent	356	n receiving wat	30
std dev	2.19	std dev	3.32
mean	18.16	mean	14.53
cv	0.12	cv	0.23
95th percen	21.2	95th percentile	20.32

RPA (see RPA Workbook)

June 1 - July 15 Max Daily Limit

Effluent				Receiving Water	
June Date	June Temp	July 1-14 Date	July 1-14 Temp	June	July 1-14
6/1/2005	15	7/1/2005	19	9.1	15.1
6/2/2005	15	7/5/2005	19	10.9	17.2
6/3/2005	15	7/6/2005	20	12.8	15.1
6/6/2005	15	7/7/2005	20	14.9	24.1
6/7/2005	15	7/8/2005	20	11.6	21.4
6/8/2005	15	7/11/2005	19	12.5	17.6
6/9/2005	16	7/12/2005	19	13.9	14.9
6/10/2005	18	7/13/2005	21	9.6	15.3
6/13/2005	16	7/14/2005	20	12.9	
6/14/2005	16	7/3/2006	21	13.2	
6/15/2005	16	7/5/2006	22	16.3	
6/16/2005	17	7/6/2006	22	18	
6/17/2005	18	7/7/2006	20	16.2	
6/20/2005	17	7/10/2006	20	16.5	
6/21/2005	17	7/11/2006	21	19	
6/22/2005	19	7/12/2006	21	14.4	
6/23/2005	18	7/13/2006	22	10.7	
6/24/2005	18	7/14/2006	21	10.4	
6/27/2005	18	7/2/2007	22	15	
6/28/2005	18	7/3/2007	21	12.1	
6/29/2005	18	7/5/2007	21	12.5	
6/30/2005	18	7/6/2007	21	12.8	
6/2/2006	18	7/9/2007	21		
6/5/2006	17	7/10/2007	21		
6/6/2006	17	7/11/2007	21		
6/7/2006	18	7/12/2007	22		
6/8/2006	17	7/13/2007	22		
6/9/2006	16	7/1/2008	20		
6/12/2006	17	7/2/2008	20		
6/13/2006	17	7/3/2008	21		
6/14/2006	16	7/7/2008	20		
6/15/2006	16	7/8/2008	21		
6/16/2006	17	7/9/2008	20		
6/19/2006	19	7/10/2008	21		
6/20/2006	18	7/11/2008	20		
6/21/2006	18	7/14/2008	21		

n effluent	1900	n receiving water	162
std dev	3.42	std dev	4.01
mean	12.13	mean	4.28
cv	0.28	cv	0.94
95th percentile	19.0	95th percentile	12.90

NO RPA (See RPA Workbook)

Sept 16 - March 31 Max Daily Limit

Effluent																Receiving Water						
January Date	January Temp	Feb Date	Feb Temp	March Date	March Temp	Sept 16-31 Date	Sept 16-31 Temp	Oct Date	Oct Temp	Nov Date	Nov Temp	Dec Date	Dec Temp	Jan	Feb	March	Sept 16-3	Oct	Nov	Dec
1/3/2005	10	2/1/2005	10	3/1/2005	11	9/16/2005	20	10/3/2005	17	11/1/2005	16	12/1/2005	11	0.6	4.5	6.8	13.8	15.9	7.8	1.7
1/4/2005	10	2/2/2005	10	3/2/2005	11	9/19/2005	19	10/4/2005	17	11/2/2005	15	12/2/2005	10	2.6	1.3	2.2	17.2	15.5	1.2	0.9
1/5/2005	10	2/3/2005	11	3/3/2005	12	9/20/2005	20	10/5/2005	16	11/3/2005	14	12/5/2005	9	0.4	2.2	2.2	13	10	1.4	1.6
1/6/2005	10	2/4/2005	11	3/4/2005	11	9/21/2005	19	10/6/2005	17	11/4/2005	13	12/6/2005	10	0.6	2.7	2.7	10	6.3	0.8	7.6
1/7/2005	10	2/7/2005	10	3/7/2005	12	9/22/2005	18	10/7/2005	17	11/7/2005	14	12/7/2005	8	1.3	0.6	1.2	13	8.3	7.8	1.8
1/10/2005	10	2/8/2005	10	3/8/2005	12	9/23/2005	18	10/10/2005	17	11/8/2005	14	12/8/2005	9	2	1.3	6.8	12.8	8.1	2	0.6
1/11/2005	9	2/9/2005	11	3/9/2005	13	9/26/2005	18	10/11/2005	17	11/9/2005	13	12/9/2005	9	1.3	0.6	3.7	8	3.1	3.7	0.8
1/12/2005	9	2/10/2005	10	3/10/2005	14	9/27/2005	19	10/12/2005	17	11/10/2005	14	12/12/2005	9	1	1.1	4.5	11.3	7.9	0.9	0.2
1/13/2005	9	2/11/2005	10	3/11/2005	13	9/28/2005	18	10/13/2005	17	11/14/2005	12	12/13/2005	10	3.1	1.3	0.7	11	6.3	4.1	0.3
1/14/2005	9	2/14/2005	10	3/14/2005	12	9/29/2005	18	10/14/2005	17	11/15/2005	12	12/14/2005	9	0	0.9	2.4	9	3.4	1.1	0.5
1/18/2005	10	2/15/2005	9	3/15/2005	10	9/30/2005	20	10/17/2005	17	11/16/2005	12	12/15/2005	9	1	0.8	1.5		14	4	0.5
1/19/2005	10	2/16/2005	9	3/16/2005	10	9/18/2006	19	10/18/2005	18	11/17/2005	12	12/16/2005	9	1	2.4	2.5		12	2	2
1/20/2005	10	2/17/2005	9	3/17/2005	10	9/19/2006	19	10/19/2005	18	11/18/2005	12	12/19/2005	8	1	1.1	2.2		10	1.9	1.1
1/21/2005	11	2/18/2005	9	3/18/2005	11	9/20/2006	19	10/20/2005	17	11/21/2005	12	12/20/2005	10	0.2	2.6	2.4		11	0.7	0.5
1/24/2005	10	2/22/2005	10	3/21/2005	11	9/21/2006	18	10/21/2005	16	11/22/2005	12	12/21/2005	11	0.9	3.6	2.4		10	8.6	1
1/25/2005	10	2/23/2005	10	3/22/2005	12	9/22/2006	18	10/24/2005	16	11/23/2005	12	12/22/2005	11	2	1.4	1.9		14	5.7	2
1/26/2005	10	2/24/2005	10	3/23/2005	12	9/25/2006	18	10/25/2005	16	11/28/2005	11	12/23/2005	10	3	3.5	2		12	1.9	1
1/27/2005	11	2/25/2005	10	3/24/2005	12	9/26/2006	19	10/26/2005	17	11/29/2005	11	12/27/2005	10	5	3	0.5		4	4	0.8
1/28/2005	11	2/28/2005	11	3/25/2005	11	9/27/2006	19	10/27/2005	16	11/30/2005	11	12/28/2005	10	3	1	0.9		4.8	0.9	2.9
1/31/2005	11	2/1/2006	9	3/28/2005	11	9/28/2006	19	10/28/2005	16	11/1/2006	13	12/29/2005	9	2	4	0.5		12.9	8	1.6
1/3/2006	10	2/2/2006	9	3/29/2005	11	9/29/2006	18	10/31/2005	15	11/2/2006	13	12/30/2005	10	2.2	5	8.8		4.4	2	0.8
1/4/2006	10	2/3/2006	9	3/30/2005	10	9/17/2007	20	10/2/2006	19	11/3/2006	15	12/1/2006	10		6	5.2		8	3	0.6
1/5/2006	10	2/6/2006	10	3/31/2005	10	9/18/2007	20	10/3/2006	18	11/6/2006	15	12/4/2006	10		5	3.9		8.2	3	0
1/6/2006	10	2/7/2006	10	3/1/2006	9	9/19/2007	19	10/5/2006	18	11/7/2006	16	12/5/2006	11		6	6		7		0.5
1/9/2006	9	2/8/2006	10	3/2/2006	10	9/20/2007	20	10/6/2006	18	11/8/2006	14	12/6/2006	11		7	6.7		8		2
1/10/2006	10	2/9/2006	10	3/3/2006	10	9/21/2007	19	10/9/2006	20	11/9/2006	14	12/7/2006	12		2	4.4		8		2
1/11/2006	9	2/10/2006	9	3/6/2006	9	9/24/2007	19	10/10/2006	17	11/13/2006	12	12/8/2006	11			9.8		9		
1/12/2006	9	2/13/2006	9	3/7/2006	9	9/25/2007	19	10/11/2006	17	11/14/2006	13	12/11/2006	12			9.4				
1/13/2006	10	2/14/2006	9	3/8/2006	9	9/26/2007	19	10/12/2006	16	11/15/2006	13	12/12/2006	11			11				
1/17/2006	10	2/15/2006	8	3/9/2006	9	9/27/2007	19	10/13/2006	17	11/16/2006	13	12/13/2006	11							
1/18/2006	9	2/16/2006	9	3/10/2006	8	9/28/2007	19	10/16/2006	17	11/17/2006	13	12/14/2006	11							
1/19/2006	10	2/17/2006	7	3/13/2006	9	9/16/2008	20	10/17/2006	16	11/20/2006	14	12/15/2006	10							
1/20/2006	9	2/21/2006	8	3/14/2006	9	9/17/2008	20	10/18/2006	16	11/21/2006	14	12/18/2006	10							
1/23/2006	10	2/22/2006	9	3/15/2006	10	9/18/2008	19	10/19/2006	16	11/22/2006	13	12/19/2006	10							
1/24/2006	9	2/23/2006	9	3/16/2006	9	9/19/2008	20	10/20/2006	16	11/27/2006	12	12/20/2006	11							
1/25/2006	9	2/24/2006	8	3/17/2006	9	9/22/2008	20	10/23/2006	16	11/28/2006	12	12/21/2006	12							

Appendix C. Public Involvement Information

DEQ proposes to reissue a permit to City of Grangeville WWTP. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and DEQ's reasons for requiring permit conditions.

DEQ will place a Public Notice of Draft on 01/08/2020 in Idaho County Free Press to inform the public and to invite comment on the proposed 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 proposed 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 proposed 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 CITY OF GRANGEVILLE WASTEWATER TREATMENT FACIITY

PROPOSED ACTION: The City of Grangeville has applied to the Department of Environmental Quality (DEQ) for an Idaho Pollutant Discharge Elimination (IPDES) wastewater discharge permit for its municipal wastewater treatment facility located on 225 West North Street, Grangeville, ID. DEQ is seeking public comment on the draft IPDES permit, associated fact sheet, and application for the City of Grangeville Wastewater Treatment Facility. This proposed permit authorizes the discharge of treated municipal wastewater in year-round to Threemile 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, February 7th, 2020 at 5 p.m. MST. A public hearing may be held, if requested in writing by Wednesday, January 22nd, 2020. The draft permit and fact sheet are available for public review at DEQ's state office in Boise, the Lewiston 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

Appendix D. 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 E. Public Comments and Response to Comments

Idaho Pollutant Discharge Elimination System Discharge Permit No. ID0020036

Response to Comments on Draft City of Grangeville IPDES Permit

February 21, 2020 comment deadline

J-U-B Engineers, Inc. February 21, 2020 Letter

Introduction

J-U-B Engineers, Inc. (J-U-B) is submitting these comments on behalf of the City of Grangeville (City). We appreciate the opportunity to comment on the proposed IPDES Permit (draft Permit) for the City and look forward to working with the Idaho Department of Environmental Quality (DEQ) to development the final Permit and Fact Sheet, conforming to state and federal regulations.

The City's protection of public health and safety is an important responsibility. The City seeks to ensure compliance and comply with Clean Water Act regulations. Both financial and technical resources are required to ensure investments are made to ensure long-term compliance under the Clean Water Act. For the City to efficiently invest in the protection and safety of the public health, the IPDES permitting program must effectively inform and support the City to plan, implement, and manage long-term strategies.

General Comments

1. Issue #1: Typographical Errors

   There are some typographical errors still in the permit and fact sheet.
   Request:
   Please perform an internal review and address errors. The City further requests a follow up meeting to discuss how this issue is addressed prior to the issuance of the final Permit.
   Examples:
   (i) Permit, Page 10, Paragraph 1, Sentence 1: "xpressed" to "expressed"
   (ii) See Issue #6 below.
   (iii) Fact Sheet, Page 11, Paragraph 2, Sentence 1: "etermine" to "determine"

Response 1: Regarding (i) and (iii), DEQ has discovered when using the "Save As PDF" function, the first letter in various rows of the document are lost. This has been solved by using "Print as PDF."

Changes to draft permit: The document has been converted to a PDF in a way that doesn't corrupt the text. Issue (ii) has been corrected.

2. Issue #2: Antidegradation

The Fact Sheet includes imprecise language referring to Tier I protection and antidegradation. We have grave concerns that important IDAPA language is being misquoted in this legal document and is not received adequate internal legal review. Please address this issue carefully in order to avoid a permit appeal.
Request:
Please perform an internal review of Section 3.5 Antidegradation and revise the language to conform to federal and state regulations. The City further requests a follow up meeting to discuss how this issue is addressed prior to the issuance of the final Permit.

Examples:
(i) Fact Sheet, Subsection 3.5.1:

A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing ~~and designated~~ uses and the level of water quality necessary to protect existing ~~and designated~~ uses shall be maintained and protected. In order to protect and maintain existing ~~and designated beneficial~~ uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS.

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 ~~existing~~ uses (IDAPA 58.01.02.055.04).

Explanation:
Permits are legal documents that can enforce stipulations that are more stringent than IDEQ regulations, so we believe it is critical that regulatory language, especially language dealing with antidegradation and Tier I protection, is precise and matches the department's source materials.
For a similar example, please refer to the letter from Association of Idaho Cities to the IDEQ Re: Draft Idaho Antidegradation Implementation Procedures Guidelines – Version 2, dated January 13, 2020.

Response 1: Overall, multiple requirements work in tandem to maintain and improve the quality of Idaho waters subject to Clean Water Act jurisdiction. Under one such set of requirements, Idaho's federally-approved antidegradation policy, all waters receive Tier I protection (IDAPA 58.01.02.052.01). For unimpaired waterbodies, Tier 1 prohibits degradation that would cause or contribute to a violation of water quality criteria after any authorized mixing (IDAPA

58.01.02.052.07). For impaired waterbodies, Tier 1 prohibits degradation that would contribute to an existing violation of water quality criteria.

Changes to draft permit: Though in some circumstances designated uses may in fact receive protection under Tier 1, to more closely reflect the exact rule language and reduce confusion the first two instances of the words "and designated" in the first paragraph of Fact Sheet 3.5.1 have been removed.

Because TMDLs are developed where existing or designated uses are not fully supported (IDAPA 58.01.02.055.02), "existing" has been kept in the second paragraph and has been stricken from the third paragraph of Fact Sheet 3.5.1.

The language in questions now reads as follows:

> *A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing 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).*

3. Issue #3: Total Ammonia Compliance Schedule

Request:
Provide an ammonia compliance schedule and interim limits. Please schedule a follow up meeting to review the pre-final schedule/limits prior to issuance of the final permit.

Explanation:
Permit, Page 6, Paragraph 2, Sentence 1: The permit states that there is a compliance schedule for total ammonia. It is also stated in note "h" of Table 2. However, Table 3, Table 4, Table 5, and Section 3.1 do not mention the compliance schedule for ammonia or give interim limits for ammonia.

Fact Sheet, Page 25, Paragraph 4: The fact sheet explains that the schedule and interim limits were possible but IDEQ staff chose not to provide them based on historical plant data. We believe with the new permit limits, sampling frequency, and other requirements that there are

periods in the spring the City could violate the proposed limits. This is primarily due to the effect of high infiltration and inflow (I&I) into their system.

The City is currently going through an integrated planning process that includes reducing the I&I into their sewer system, which would prepare them for wastewater treatment plant improvements. The planning integrates decision-making, capacity analysis, rate analysis, condition assessment, compliance considerations, and improvement plans. This work has found an above average amount of stormwater/groundwater is collected in the sewer system during spring storm events. The City is committing to large investments in the sewer collection system in order to reduce the loading to the WWTF. In order to meet ammonia limits in the spring, which is not the critical low flow period for the stream, the City will need time to implement their integrated planning efforts. We believe this approach is consistent with the Integrated Municipal Stormwater and Wastewater Planning Approach Framework memorandum issued by EPA on June 6, 2012 and subsequent updates to the Clean Water Act (January 2019).

Response 3: When a final limit cannot be achieved, an interim limit that the facility can achieve is developed for a specified period of time. The interim limit a facility can achieve is also known as a performance-based limit. The typical performance data of the facility is compiled, and the interim daily maximum limit is typically calculated by taking the 95th percentile of the available data.

A total ammonia limit is new for the permittee and a compliance schedule and interim limit were originally drafted and all data used for the analysis were provided by the permittee and submitted via DMRs. However, DEQ noticed that the performance-based interim limit for ammonia was more stringent than the final limit. The final daily maximum limit in the draft permit is 18 mg/L, whereas the 95th percentile of the data from 2013 to May 2019 was 6.1 mg/L, and the maximum observed effluent concentration was 15.5 mg/L[6]. Therefore the compliance schedule and interim limit were originally unnecessary in the draft permit.

After receiving public comment, the mixing zone for ammonia was deemed inappropriate under IDAPA 58.01.02.060.01.h.i(1). As explained in Comment/Response 21, the width of the mixing zone is greater than 25% in this effluent dominated stream. After removal of the mixing zone, the limits were re-evaluated and performance-based interim limits for ammonia were more stringent than the final limit. With the new potential for the permittee to exceed new limits a compliance schedule and interim limits were developed.

Changes to draft permit: A compliance schedule and interim limits for total ammonia have been added to the permit and fact sheet.

Submission Schedule

4. Issue #4: Initial Submittal Date
Request:

[6] This response uses the updated ammonia limits. See Response 21 for ammonia limit adjustment.

Please update the initial submittal dates on Page 2 if the effective date of the permit ends up later than what is listed on Page 1.

Explanation:
Since this permit will receive comments that will take time to address, we want to confirm that the first submission date for the DMR, and other items, is updated to reflect the final effective date and conforms to Section 2.2.3 of the permit.

Response 4: DEQ updates all submission schedule dates, as applicable, depending on the effective date of the permit.

Changes to draft permit: Submission schedule dates are updated.

Subsection 1.2 Effluent Limits and Associated Monitoring Requirements

5. Issue #5: Table 2 Temperature Period Rows
Request:
Table 2: Add rows for temperate periods "04/01 to 05/31" and "07/15 to 09/15", then state, "See Table 4" and "See Table 5", respectively.

Explanation:
This reduces confusion on the final temperature limits.

Response 5: The effluent limit tables are set up to communicate with EPA's Integrated Compliance Information System (ICIS). DEQ agrees having a compiled table of limits is useful, which is why the requested change is present in the fact sheet Table 8 for permittee to use as a reference.

Changes to draft permit: None.

6. Issue #6: Calibration Date Clarification
Request:
Page 11, Paragraph 2, Sentence 1: Reword "…date of late calibration …" to clarify intent.

Explanation:
This may be a spelling error and should read "last calibration".

Response 6: Thank you for the comment, DEQ has made this change.

Changes to draft permit: The sentence has been corrected to reference the "last calibration."

Subsection 2.1.4 Receiving Water Monitoring

7. Issue #7: Threemile Creek Monitoring Equipment
Request:

Page 15, Paragraph 3, Bullet Number 1: Revise dates to reflect DEQ approval of the monitoring station location by 5/1/2020 and installation of equipment and start of data collection by 11/1/2020.

Explanation:
Installing equipment to monitor Threemile Creek by 04/01/20 is not enough time and most likely not possible with high flow and weather conditions in the following months. Also, the date to request DEQ approval of the monitoring station location is 5/1/20, which is after the date that the sampling equipment must be installed and collecting information. This process may take a substantial amount of time if permitting, design, plans and specs, and construction is needed to provide an appropriate sampling station.

Response 7: Table 9 of the permit notes that flow and temperature monitoring are not required until 07/01/2020, providing three months from the permit issuance date to procure and install equipment. The location of the flow and temperature monitoring can be different than the established sampling location, as long as the new location is representative of the receiving water. All other parameters must be monitored starting 05/01/2020, at the facility's historically established location. Please note that receiving water monitoring is not dependent on station approval, and is required regardless of approval status. The City has an established receiving water sampling location, and has until 06/01/2020 to upload the station approval request to the IPDES E-permitting system.

Changes to draft permit: Section 2.1.4 of the permit has been updated to clarify monitoring start dates, and station approval requirements. .

8. Issue #8: Inconsistent Dates
Request:
Page 16, Table 9: Revise start date of data collection to match Page 15 Paragraph 3 Bullet Number 1, which would be 11/1/2020 based on our recommended revisions.

Explanation:
June 1, 2020 start is different from the start date on Page 15. This should coincide with the final date of installation.

Response 8: Receiving water monitoring must start 05/01/2020, except for the flow and temperature monitoring. See Response 7.

Changes to draft permit: None.

Subsection 2.1.5 Permit Renewal Effluent Monitoring

9. Issue #9: Schedule Clarification
Request:
Page 17, Paragraph 4: Revise to end scans at time of permit application submittal.
Example: "The permittee must continue the schedule above until the permit application is submitted to DEQ." Please add 2023 and 2024 to the schedule so that he intent for those years is clear.

Explanation:
The schedule and intent of the data collection is confusing. The data is due with the permit application, so any data collection beyond the permit application submittal date seems to be unnecessary. It would also seem excessive to require this testing throughout an administratively extended permit. Does this schedule imply that a scan in the first quarter of 2023 and fourth quarter in 2024 are required?

Response 9: Over a five year period, facilities often upgrade equipment, change operations, and potentially receive effluent from new sources. Having recent, representative data is critical for permit development. After a permit application is submitted and deemed complete, a permit writer can request more recent data from a permittee (IDAPA 58.01.25.105.11.f.iv-vi & 58.01.25.105.05).

Changes to draft permit: Permit renewal sampling has been pushed back one year and the permit renewal text has been updated to:

> *"The permittee must continue to conduct permit renewal sampling in Table 10 and Table 11 every five quarters after the September 2024 sampling event (e.g., December 2025, March 2027, June 2028, etc.)."*

10. Issue #10: Dissolved Oxygen Sampling
Request:
Page 17, Table 11: Revise dissolved oxygen sampling to a grab sample.

Explanation:
Dissolved oxygen is typically a field measurement collected in-situ. The testing of dissolved oxygen is not amenable to composite sampling. See U.S. EPA Interim Revised NPDES Inspection Manual (2017) Chapter 5, Page 101 (https://www.epa.gov/sites/production/files/2017-03/documents/npdesinspectchapter-05.pdf).
If the IDEQ believes that they are constrained by the CFR language, it appears one of the few ways this issue can be addressed is to apply the provision in the first paragraph of 40 CFR 122.21(j), and this option should be pursued:

> **(i)** "...The Director may waive any requirement of this paragraph if he or she has access to **substantially identical information**. The Director may also waive any requirement of this paragraph that is **not of material concern** for a specific permit, if approved by the Regional Administrator..."

Response 10: According to IDAPA 58.01.25.105.11.g.ii.(1), the only parameters to be sampled via grab sample for POTW permit renewal applications are pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform, and volatile organics. All other permit renewal parameters must be collected with a 24-hour composite sample. 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 more appropriate 40 CFR 136 approved method of sampling DO uses a grab sample, and provides identical information. The sampling method waiver is now applied to City of Grangeville permit renewal sampling for DO.

Changes to draft permit: The DO permit renewal monitoring collection method has been changed to a grab samples, consistent with 40 CFR 136.

Section 3 Special Conditions Subsection

11. Issue #11: Date
Request:
Page 27, Bullet Number 1: Fill in date place holder.

Explanation:
No date is specified in the "Insert Date" place holder.

Response 11: The Section 3.5.1 Spill Control Plant submittal date has been updated to match the submission schedule table of the permit. The due date is 10/28/2020.

Changes to draft permit: The date from the submission schedule table has been added to section 3.5.1.

Subsection 4.1.1 Quality Assurance Project Plan

12. Issue #12: QAPP Updates
Request:
Page 28, Section 4.1.1, Bullet 4, Sentence 2: Remove requirement to notify DEQ of all modifications to the QAPP.

Explanation:
The draft permit is written to require the permittee to notify DEQ of all significant QAPP modifications. This is more restrictive than what is currently required by EPA and is not needed. QAPPs are living documents that reflect the real-time practices of the laboratory operations and sampling. This document should be kept up to date. However, requiring the permittee to notify DEQ of all significant change in the QAPP is excessive and does not serve the intended purpose.

Response 12: DEQ agrees that notifying DEQ of all significant QAPP modifications may be excessive in some instances. The permittee is encouraged to discuss changes to the QAPP with the regional IPDES compliance officer to avoid any potential issues that may result.

Changes to draft permit: Removed requirement to notify DEQ of all modifications to the QAPP.

FACT SHEET COMMENTS

Subsection 2.2 Description of Receiving Water

13. Issue #13: Phosphorous Levels
Request:
Page 14 Table 5: Please verify these results are accurate and are not swapped.

Explanation:
Total phosphorous should not be less than ortho-phosphorous, in a representative sample.

Response 13: The phosphorus levels listed in Table 5 are from the South Fork Clearwater River TMDL. Table 24 of the South Fork Clearwater River TMDL states that the mean ortho-phosphorus concentration for the outfall itself is 1.79 mg/L. The upstream receiving water concentration for the mean ortho-phosphorus concentration is 0.05 mg/L.

Changes to draft permit: The outfall value has been removed, and the correct receiving water value has been included in Table 5 of the fact sheet.

Subsection 3.3.3.1 Total Ammonia (as N)

14. Issue #14: Facility Improvements
Request:
Page 25, Paragraph 4: Strike sentences 1 and 2 from the paragraph.

Explanation:
Recent planning efforts by the City has shifted their capital improvement focus for the next few years. Timing and necessity of wastewater facility improvements will be addressed through integrated facility planning and following collection system improvements to reduce I&I.

Response 14:DEQ has made the requested change.

Changes to draft permit: The referenced sentences have been removed.

15. Issue #15: Interim Limits
Request:
Page 28 Paragraph 1 Sentence 1: Increase interim temperature limits to greater than historical readings.

Explanation:
If the interim limit is based on the 95th percentile of historic data, there is a high likelihood of some violations in the interim period. The current facility does not have a treatment process for removing heat from the discharge.

Response 15: There is always a chance a permittee may exceed a limit, interim or otherwise. DEQ does not agree that a 5% chance of exceeding a limit is a high likelihood, and performance based interim limits have been the standard for interim limits in EPA NPDES permits. When calculating final limits, the 95th percentile of effluent characteristics is used, and is correspondingly used in interim limits. Allowing higher limits than what the facility can currently achieve could result in degradation of the receiving water.

Changes to draft permit: None.

Subsection 3.5 Antidegradation

16. Issue #16: Section Numbering
Request:
Page 28: Please show the section number for the Antidegradation section. Based on the sequence, we believe it is 3.5 Antidegradation.

Response 16: DEQ agrees with this comment.

Changes to draft permit: The section numbering has been added to this section.

Subsection 3.6.2 Total Residual Chlorine

17. Issue #17: Calculation Change
Request:
Page 31 Paragraph 2 Sentence 2: Expand on the statement, "despite the design flow and concentration remaining the same."

Explanation:
Was there a calculation error in the 2005 permit, or are there potentially different assumptions made in the new IPDES permit?

Response 17: The 2005 fact sheet average monthly limit load for TRC is 0.066 lb/day. The 2020 permit has the same concentration limit, but the load limit is calculated as 0.051 lb/day. Even when accounting for a difference in number of significant figures in the load calculation, it is unknown how the 2005 load limit was calculated and the fact sheet did not give an explanation.

Concentration (in mg/L) X Flow (in mgd) X Conversion Factor (8.34) = lb/day
0.007 mg/L X 0.88 mgd X 8.34 = 0.051 lb/day

Changes to draft permit: None.

Association of Idaho Cities February 21, 2020 Letter

18. The Idaho Department of Environmental Quality (DEQ) is seeking public comments on a draft Idaho Pollutant Discharge Elimination System (IPDES) permit for the City of Grangeville, one of the 200 municipalities in Idaho and a member of AIC.

AIC members appreciate DEQ staff efforts and understand the many advantages for delegation of the Clean Water Act discharge permit program to Idaho including (1) access to regulators and technical compliance assistance, (2) increased competency of state regulators and technical compliance assistance, and (3) access to and improved coordination of state and federal financial and technical resources for facility planning and capital improvements.
AIC has discussed the draft Permit with JUB Engineers, Inc., David Watkins and has been engaged in the development of the comments submitted on behalf of the City of Grangeville. Please accept this letter as a statement of concurrence and support for the comments that have been submitted, including the City's requests for follow up meetings and correspondence prior to the issuance of the final Permit. Additional discussion with the City, JUB, and AIC have been requested in order to facilitate mutual concurrence with the final Permit. Should you have questions concerning the attached comments, please feel free to contact me.

Response 18: Thank you for your comment. See responses 1 through 17.

Changes to draft permit: See responses 1 through 17.

Idaho Conservation League Comments February 21, 2020 Letter

19. Receiving Water Monitoring
Please explain why the draft permit only requires receiving water monitoring of flow from April 1 to September 30. We request DEQ revise the final permit to require year-round flow monitoring for receiving water to ensure critical conditions that may occur between October and March are identified and recorded. If DEQ declines this request, please explain the basis for DEQ's decision.

Response 19: Flow monitoring is typically used to determine critical low flows in receiving waters, giving the permit writer the ability to calculate assimilative capacity of the receiving water for toxic pollutants. In this permit, receiving water monitoring was included in the City of Grangeville permit to determine the temperature limit, when temperature is limited (April 1 through September 30). The temperature limit is determined using the effluent flow rate and receiving water flow rate, thus receiving water flow monitoring is required. The receiving water flow monitoring was not extended year-round to capture critical low flows as the conventionally toxic pollutants (ammonia and TRC) are not authorized mixing zones (See Response 21). A temperature mixing zone is authorized in the South Fork Clearwater River Subbasin TMDLs, and is extended to the temperature limit developed between the two salmonid spawning seasons. Because flow monitoring is not required year-round the mixing zone for temperature between October 1 and March 31 was removed. This did not change the results of RPA. The permittee may monitor flow year-round, if they choose. Year-round monitoring is encouraged by DEQ, as it would allow for more accurate development of seasonal limits, where appropriate, in the next permit cycle.

Changes to draft permit: The mixing zone for temperature between October 1 and March 31 was removed.

20. Compliance Schedule

Please discuss DEQ's basis for proposing a 19-year compliance schedule for achieving effluent limits for temperature. The Permittee stated in its application that it believes the Permittee's best option to address the final temperature effluent limits would be to store the effluent during the months of concern in the summer. It is not clear from DEQ's factsheet why developing a storage or re-use facility requires a 19-year compliance plan. We request DEQ revise the compliance plan in the final permit to include a provision that the compliance schedule may be altered or reduced, according to the particular option (e.g. treatment plant upgrades, seasonal re-use, etc.) the Permittee chooses for meeting the final temperature effluent limits. If DEQ declines this request, please explain the basis for DEQ's decision.

Response 20: The compliance schedule length was based on the time necessary to raise funds for potential facility upgrades (as the City has already spent and borrowed a considerable amount of money upgrading their facility to remove total phosphorus) and implement a potential effluent trading project (such a project could take time negotiating with private land owners and planting trees). DEQ agrees a provision to adjust the compliance schedule, as necessary, is appropriate.

Changes to draft permit: The following text has been included in Section 3.1

> *"This compliance schedule and applicable dates may be modified after task 6, when a final plan and schedule for meeting temperature effluent limits has been submitted to DEQ."*

Mixing Zones

21. *General*

Please provide the "case-by-base" analysis DEQ used to determine that it is appropriate to authorize mixing zones for ammonia, total residual chlorine, and temperature in this draft IPDES permit. That analysis does not appear to be included in DEQ's factsheet or at least not to the level contemplated in DEQ's Effluent Limit Development Guidance. For example, the factsheet does not include the dilution factor used nor the configuration of the mixing zone. We are also concerned that mixing zones should not be authorized for the Permittee because, during low flow conditions, Threemile Creek is effluent-dominated at the Permittee's point of discharge. During these conditions, it is unclear from DEQ's factsheet whether or not Threemile Creek maintains the assimilative capacity necessary to ensure compliance with the water quality standards requiring the width of a mixing zone not to exceed 25% of the stream width. IDAPA 58.01.02.060.01.h.i.(1).

Response 21: Since the maximum design flow of the facility is significantly greater than the critical low flows, the Cormix program could not model flow mixing. As a result, the mixing zones for the acutely and chronically toxic pollutants total ammonia and chlorine have been removed. The average monthly and the maximum daily total ammonia limit were lowered, triggering an ammonia compliance schedule and interim limits (see Response 3).

The 25% mixing zone for temperature was maintained for TMDL WLA- and summer WQBEL-driven limits. As stated in IDAPA 58.01.02.060.01.h, "the Department may authorize mixing zones that vary from the restrictions." DEQ is authorizing the potential for a greater than 25%

mixing zone width for temperature to be consistent with TMDL WLA and because temperature is a non-conservative pollutant.

Please see section 3.7.2 of DEQ's IPDES Effluent Limit Development Guidance (https://www.deq.idaho.gov/media/60181085/ipdes-effluent-limit-development-guidance-1217.pdf) and Table 28 of the Fact Sheet for how assimilative capacity of temperature was determined between salmonid spawning time frames.

Changes to draft permit: The mixing zones for ammonia and total residual chlorine have been removed, and the maximum daily limit for ammonia is now 18.1 mg/L (previously 19 mg/L). A compliance schedule and interim limits for ammonia have been added.

22. *Ammonia*

Please explain why DEQ authorized a mixing zone for ammonia. If water quality criteria can be met at the end of pipe, a mixing zone is not applicable. Since installing facility upgrades in 2013, the Permittee has been treating ammonia to levels well below the limits proposed in the Draft IPDES permit. We request DEQ remove the mixing zone for ammonia or explain why the Permittee is unable to meet the water quality criteria for ammonia at end of pipe.

Response 22: See response 21.

Changes to draft permit: DEQ has removed the mixing zone for ammonia.

23. *Temperature*

Please explain why the final temperature effluent limits presented in Tables 4 and 5 of the proposed IPDES permit do not match the temperature effluent limits promulgated for the Permittee in the 2004 South Fork Clearwater River Subbasin Assessment and TMDL at Tables 46 and 47. It is unclear how the effluent limits in the proposed IPDES permit and the effluent limits in the TMDL can be reconciled and why DEQ altered the tables.

Please also provide an explanation or the analysis that demonstrates that there is available assimilative capacity in Threemile Creek to authorize a mixing zone for temperature. We understand that the 2004 South Fork Clearwater River Subbasin Assessment and TMDL incorporated a 25% mixing zone in the waste load allocation for the Permittee. But, we were not able to identify where in the TMDL or in DEQ's factsheet it was demonstrated that Threemile Creek has available assimilative capacity for temperature. IDAPA 58.01.02.060.01.a.

Response 23: The Tables 4 and 5 of the permit use effluent flows (columns) and receiving water flows (rows) that are representative of the wastewater treatment plant discharge and Threemile Creek flows. The method of limit calculation is the same as the TMDL, and is listed as table note a in both TMDL temperature limit table in the permit (Table 4 and 5). Please note, it is the equation that determines the temperature effluent limit, not Tables 4 and 5. Additionally, DEQ is

requiring a temperature spreadsheet to be submitted through the E-permitting system, due contemporaneously with the monthly DMR submittals.

In each flow bracket, cell values are calculated using the more conservative receiving water low flow and higher effluent flow, yielding the most conservative temperature possible, under the available conditions. For example:

Table 4. TMDL Temperature effluent limits[a,b] for the Grangeville WWTP (April 1 through May 31)

Grangeville Effluent Discharge (cfs)	Effluent Limit Type	Units	Threemile Creek Discharge (cfs)				
			≤0.5	>0.5 ≤1	>1 ≤5	>5 ≤10	>10
≤0.1			9.3	9.7	10.1	13.1	16.8
>0.1 ≤ 0.5			9.3	9.4	9.5	10.1	10.8
>0.5			9.3	9.3	9.4	9.6	9.8
>1.5 ≤3	Maximum daily average[d]	°C	9.3	9.3	9.3	9.4	9.6
>3 ≤6.8			9.3	9.3	9.3	9.3	9.4
>6.8[c]			9.3	9.3	9.3	9.3	9.3

$$Effluent\ temperature\ (°C) = \frac{\left[\left(Effluent\ Flow + (0.25\ \times river\ flow)\right) \times (9°C + 0.3°C)\right] - \left[(0.25\ \times River\ Flow) \times 9°C\right]}{Effluent\ Flow}$$

$$Effluent\ temperature\ (°C) = \frac{\left[\left(3 + (0.25\ \times 5)\right) \times (9°C + 0.3°C)\right] - \left[(0.25\ \times 5) \times 9°C\right]}{3}$$

$$Effluent\ temperature\ (°C) = \frac{\left[\left(3 + (1.25)\right) \times (9.3°C)\right] - \left[(1.25) \times 9°C\right]}{3}$$

$$9.4\ °C = \frac{[39.525] - [11.25]}{3}$$

Please see section 3.7.2 of DEQ's IPDES Effluent Limit Development Guidance (https://www.deq.idaho.gov/media/60181085/ipdes-effluent-limit-development-guidance-1217.pdf) and Table 28 of the Fact Sheet for how assimilative capacity of temperature was determined between salmonid spawning time frames. The TMDL WLA temperature limit equation assumes the receiving water is impaired (thus has no assimilative capacity) and authorizes end of pipe limits that would not raise receiving water temperature more than 0.3°C, as well as incorporates a 25% mixing zone of receiving water flow (see page 184, Chapter 5 of the South Fork Clearwater River Subbasin Assessment and TMDLs).

Changes to draft permit: None.

Environmental Protection Agency Comments February 21, 2020 Letter

Draft Permit

24. Effluent Limitations for Total Phosphorus (Table 2 and Section 1.2.1)
The draft permit proposes a seasonal average effluent limit for total phosphorus of 0.49 lb/day (0.22 kg/day) and an average monthly limit of 1.1 lb/day.

The fact sheet states, in Section 3.6.4, that the 0.22 kg/day wasteload allocation (WLA) assigned to the City of Grangeville in the *South Fork Clearwater River Subbasin Assessment and Total Maximum Daily Loads* ("South Fork Clearwater River TMDL") "is an average allocation for a specified season (July 1 to September 15). Permit limits based on WLAs should be expressed in a manner consistent with these averaging periods. The 2005 permit mistakenly equated the TMDL seasonal WLA to the average monthly limit."

For the reasons explained below, the EPA disagrees with the interpretation of the South Fork Clearwater River TMDL articulated in Section 3.6.4 of the fact sheet.

Federal regulations at 40 CFR 122.44(d)(1)(vii) state that:

> "When developing water quality-based effluent limits…the permitting authority shall ensure that:
>
> …
>
> (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7."

The South Fork Clearwater River TMDL includes a phosphorus WLA for the City of Grangeville of 0.22 kg/day, and this TMDL was approved by the EPA pursuant to 40 CFR 130.7 on July 22, 2004.[7] As such, IDEQ is required by 40 CFR 122.44(d)(1)(vii)(B) to ensure that the total phosphorus effluent limits in the draft permit "are consistent with the assumptions and requirements" of the City's WLA in the South Fork Clearwater River TMDL.

> The South Fork Clearwater River TMDL states, on Page 158:
>
> "The WLA for the Grangeville WWTP was established based on the 0.1 mg/L TP target during the critical time period (July through mid- September), and average WWTP flows measured by DEQ during July-September 2000. The WLA does not apply during the remainder of the year. *These limits are expected to be incorporated into Grangeville's NPDES permit when it is reissued, as monthly average limits*" (emphasis added).[8]

The South Fork Clearwater River TMDL explains, on Page 153, that the 0.1 mg/L TP target from which the WLA is derived is based on the EPA's *Quality Criteria for Water 1986*, commonly referred to as the "Gold Book."[9] The Gold Book states that "A desired goal for the prevention of plant nuisances in streams or other flowing waters not discharging directly to lakes or impoundments is 100 µg/L total P," and cites *Toward a Cleaner Aquatic*

[7] The approval letter for the South Fork Clearwater River TMDL is available at: *https://www.deq.idaho.gov/media/60177229/south-fork-clearwater-river-subbasin-tmdl-approval-0704.pdf*
[8] The South Fork Clearwater River TMDL is available at: *https://www.deq.idaho.gov/media/60180971/south-fork-clearwater-river-sba-tmdl.pdf*
[9] The "Gold Book" is available at: *https://www.epa.gov/sites/production/files/2018-10/documents/quality-criteria-water-1986.pdf*

Environment by Kenneth M. Mackenthun (1973) as the basis for this statement. Mackenthun states that "total phosphorus *should not exceed* 100 µg/L P at any point within the flowing stream" (Page 176, emphasis added).[10] As such, the EPA considers the Gold Book's recommendation of 100 µg/L to be a "not to exceed" value.

While the seasonal average total phosphorus effluent limit proposed in the draft permit is identical in magnitude to the City's WLA in the South Fork Clearwater River TMDL (0.22 kg/day), the TMDL also clearly states that the WLA was expected to be expressed in the permit as an average monthly limit, as opposed to a seasonal average limit. In addition, the 0.1 mg/L TP target from which the WLA is derived is a concentration that should not be exceeded, as opposed to a seasonal average value. The EPA considers the TMDL's statement that the WLA is expected to be incorporated into the permit as an average monthly limit and the "not to exceed" nature of the TMDL's in-stream target to be parts of the "assumptions and requirements" of the City's WLA.

As such, the TP limits proposed in the draft permit for the City of Grangeville are not consistent with the assumptions and requirements of the City's WLA in the South Fork Clearwater River TMDL. To remedy this, the 0.22 kg/day (0.49 lb/day) TP limit must be expressed as an average monthly limit.

The EPA also notes that IDEQ proposes to remove the TP concentration limit that was in the prior permit. While a concentration limit for TP is not necessary for consistency with the assumptions and requirements of the City's TP WLA, the EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD) states, at Section 5.7.1, that "EPA recommends that permit limits on both mass and concentration be specified for effluents discharging into waters with less than 100 fold dilution to ensure attainment of water quality standards."[11] At complete mix, the 30Q5 stream flow rate (0.28 CFS) paired with the facility's design flow (1.36 CFS) provides a dilution factor of 1.2:1. Thus, IDEQ should consider including both mass and concentration limits for TP.

Response 24: DEQ agrees that consistency with the TMDL statement "These limits are expected to be incorporated into Grangeville's NPDES permit when it is reissued, as monthly average limits" means the average monthly TP load limit should be changed to 0.49lb/day and the seasonal limit of 0.49 lb/day should be removed.

With regard to the removal of the concentration limit, DEQ intends to include concentration limits for all WQC-driven limits (where applicable) and for TMDL-driven limits for most pollutants. However, for nutrients, it is not necessary to include a concentration limit to attain water quality standards, as the impact of nutrients vary highly in time and distance from a point source.

Changes to draft permit: The average monthly TP load limit has been changed to 0.49 lb/day and the seasonal limit of 0.49 lb/day has been removed.

[10] *Toward a Cleaner Aquatic Environment* is available at: *https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9100M9RA.txt*
[11] The TSD is available at: *https://www3.epa.gov/npdes/pubs/owm0264.pdf*

Fact Sheet

25. The mean ortho-phosphorus concentration listed in Table 5 of the fact sheet for Threemile Creek above the City's outfall (1.79 mg/L) is incorrect. Table 5 references the South Fork Clearwater River TMDL as the source for that concentration. Table 24 of the South Fork Clearwater River TMDL states that the mean ortho-phosphorus concentration for the outfall itself is 1.79 mg/L; above the outfall, the mean ortho-phosphorus concentration is 0.05 mg/L.

Response 25: DEQ agrees with this comment, and corrected Table 5 of the fact sheet.

Changes to draft permit: The outfall value has been removed, and the correct receiving water value has been included in Table 5 of the fact sheet.

Other changes

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

1. Language in section 2.1.3 (Sewage Sludge Monitoring) has been updated to new standard language.
2. The term and definition of scan has been removed. Text refers to permit renewal "samples" instead of "scans."
3. A footnote referring to *E. coli* effluent samples has been changed to:
   Idaho's water quality standards for primary contact recreation include a single sample value of 576 #/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 ~~begin monitoring~~ according to IDAPA 58.01.02.251.01.a. ~~to determine compliance with the monthly geomean.~~