



Fact Sheet

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

**City of Carey
Wastewater Treatment Facility**

Public Comment Start Date: April 11, 2018
Public Comment Expiration Date: May 11, 2018

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The EPA Proposes To Reissue NPDES Permit

The EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment facility to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:

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

State Certification

Upon the EPA's request, the Idaho Department of Environmental Quality (IDEQ) has provided a draft certification of the permit for this facility under Section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Idaho Department of Environmental Quality
Twin Falls Regional Office
Attn: Surface Water Quality Manager
650 Addison Ave. West, Suite 110
Twin Falls, Idaho 83301
(208) 736-2194 or Toll free (800) 270-1663

Public Comment

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

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

Documents are Available for Review

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

US EPA Region 10
Suite 900
1200 Sixth Avenue, OWW-191
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

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

Idaho Department of Environmental Quality
Twin Falls Regional Office
650 Addison Ave. West, Suite 110
Twin Falls, Idaho 83301
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Acronyms

AML	Average monthly limit
AWL	Average weekly limit
BOD	Biological oxygen demand
cfs	cubic feet per second
CMOM	Capacity, management, operation, and maintenance
CV	Coefficient of variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ESA	Endangered Species Act
IDAPA	Idaho Administrative Procedure Act rules
IDEQ	Idaho Department of Environmental Quality
LA	Load allocation
LTA	Long-term average
MDL	Maximum daily limit
mg/L	milligrams per liter
mgd	million gallons per day
MOEC	Maximum observed effluent concentration
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWIS	National Water Information System
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RPFM	Reasonable potential multiplying factor
SSO	Sanitary sewer overflow
STORET	EPA STOrage and RETrieval
TBEL	Technology-based effluent limit
TMDL	Total maximum daily load
TRC	Total residual chlorine
TSD	EPA Technical Support Document

Fact Sheet

**NPDES Permit #ID0025747
City of Carey Wastewater Treatment Facility**

TSS	Total suspended solids
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water quality standard
WWTF	Wastewater treatment facility

I. Applicant Information**A. General Information**

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

Table 1. General Facility Information

NPDES Permit #:	ID0025747
Applicant:	City of Carey
Type of Ownership	Publicly Owned Treatment Works
Physical Address:	15 Griffin Loop Carey, ID 83320
Mailing Address:	20482 Main St. PO Box 9 Carey, ID 83320
Facility Contact:	Robert Simpson Public Works Director careywater@frontier.com (208) 823-4045
Operator Name:	Same as above
Facility Location:	43.28749 -113.941595
Receiving Water	Little Wood River
Facility Outfall	43.285173 -113.940188

B. Permit History

The most recent NPDES permit for the City of Carey was issued on February 17, 2004, became effective on May 1, 2004, and expired on April 30, 2009. An NPDES application for permit issuance was submitted by the permittee on November 8, 2008. The EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively extended and remains fully effective and enforceable.

II. Idaho NPDES Authorization

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

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

III. Facility Information

A. Treatment Facility Description

Service Area

The City of Carey owns and operates the wastewater treatment facility (WWTF) located in Carey, Blaine County, Idaho. The collection system has no combined sewers. The facility serves a resident population of 700 based on its application.

Treatment Process

The design flow of the facility is 0.1 mgd. The reported average flow of the facility is 0.04 mgd. The existing permit only authorizes a discharge between September 1st and April 30th; the facility typically stores its wastewater during that part of the year and then land applies its wastewater from April through October. The treatment process for river discharge consists of a 4-cell aerated lagoon, disinfection using chlorine, dechlorination, and then filtration through a sand basin. The first two cells are aerated, the third cell is for storage, and the fourth cell is for chlorination.

Land application of effluent has been conducted under an Idaho Department of Environmental Quality (IDEQ) reuse permit for land applied discharges during the growing season (April through October). The reuse permit recently expired but the City has submitted a renewal application. During periods of land application, the effluent is not dechlorinated or filtered. If for some reason the City discontinues land application of its effluent, it has indicated the lagoons have the storage capacity to maintain compliance with an NPDES permit that does not authorize year round discharge. There are no major industries discharging to the facility, and the design flow is less than 1 mgd, therefore the facility is considered a minor facility. A schematic of the wastewater treatment process and a map showing the location of the treatment are included in Appendix A.

Outfall Description

Outfall 001 is located at 43.285173, -113.940188 and intermittently discharges through an open pipe into the Little Wood River. The facility last discharged in April 2009 to test its chlorination system in lagoon cell 4.

B. Background Information

Effluent Characterization

To characterize the effluent, the EPA evaluated the facility's application information, discharge monitoring report (DMR) data, and additional data provided by the City of Carey. The facility's effluent is typically land applied during the months it is authorized to discharge and it only discharges to the river as needed. Since the last permit was issued, the facility has discharged six times; however, the facility neglected to monitor its effluent, as required by its permit. The only available data to characterize the effluent are from the facility's application and from sampling conducted in association with its reuse permit. The effluent quality is summarized in Table 2.

Table 2. Effluent Characterization

Parameter	Maximum	Minimum
pH	8.9 s.u.	6.8 s.u.
Temperature	5 °C	--
BOD ₅	13 mg/L	--
E. coli	<10 MPN/100mL	--
Total Suspended Solids	11 mg/L	--

Source: Permittee application.

Compliance History

Because the facility neglected to monitor its effluent when it discharged, as required by its permit, there are no discharge data to evaluate compliance with its effluent limits.

The IDEQ conducted an NPDES inspection of the facility on April 18, 2016. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. The results of the inspection revealed no violations or areas of concern.

Additional compliance information for this facility, including compliance with other environmental statutes, is available on Enforcement and Compliance History Online (ECHO). The ECHO web address for this facility is: <https://echo.epa.gov/detailed-facility-report?fid=110010026836>

IV. Receiving Water

A. Receiving Water Description

The facility intermittently discharges through Outfall 001, an open pipe into a branch of the Little Wood River– west canal (north) to west canal (south) - in the City of Carey. The outfall is located downstream of the Little Wood River Reservoir. Although the U.S. Geological Survey’s (USGS) National Hydrography Dataset classifies the receiving water as an intermittent stream/river, its hydrology has been altered for irrigation and flood control to the extent that it often experiences periods of zero flow and only has flow when operated as a flood control conveyance during spring runoff conditions from approximately February through July.

B. Designated Beneficial Uses

This facility discharges to a branch of the Little Wood River in the Little Wood (HUC 17040221), Water Body Unit US-3. At the point of discharge, the Little Wood River is protected for the following designated uses (IDAPA 58.01.02.150.23): cold water aquatic life, salmonid spawning, and primary contact recreation. The EPA approved State of Idaho 2014 Integrated Report lists the Little Wood River as fully supporting the primary contact recreation use and not supporting for cold water aquatic life and salmonid spawning due to low flow alterations.

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

C. Water Quality

The facility discharges to one of the branches of the Little Wood River; the branches merge downstream of the city. The 2004 permit required surface water monitoring monthly whenever the facility was discharging and the river was flowing. Because the facility did not discharge when the river was flowing, no data were available to evaluate the receiving water quality. One upstream receiving water grab sample was taken in April 2008 for the NPDES reapplication. The results of this test are presented in Table 3 below.

Table 3. April 2008 Receiving Water Monitoring Results

Pollutant	Result
Total Phosphorus	< 0.05 µg/L
Ammonia	< 0.05 µg/L
pH	6.8
Temperature	0.5 °C

D. Water Quality Limited Waters

The State of Idaho 2014 Integrated Report lists the Little Wood River, from west canal (north) to the west canal (south), as impaired for low flow alterations (Category 4c: Water bodies impaired by pollution), which does not require development of a TMDL.

E. Low Flow Conditions

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

Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	Harmonic mean flow
Ammonia	30Q10, 30Q5, 30B3, 1Q10

The critical low flow for the receiving water is the same as the previous permit. Under all conditions the critical low flow is 0 cfs because the branch of the Little Wood River to which the City of Carey discharges is often dry. No representative stream gages exist either upstream or downstream to gather data.

V. Effluent Limitations and Monitoring

Table 4 presents the existing effluent limits and monitoring requirements in the 2004 Permit. Table 5 presents the proposed effluent limits and monitoring requirements in the draft permit. The same seasonal discharge authorization (i.e., September 1st through April 30th) is in the draft permit as in the existing permit. The proposed limits have not changed from the existing permit, but there are two proposed monitoring changes.

- The frequency of flow monitoring increased from 5 times per week to continuous when discharge occurs.
- Phosphorus monitoring was removed because the receiving water is not impaired for that pollutant based on 2008 Integrated Report delisting.

Table 4. Existing Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits							
Biochemical Biological Oxygen Demand (BOD ₅)	mg/L	30	45	--	Influent and Effluent	1/month	Grab
	lb/day	25	38	--			Calculation
BOD ₅ Percent Removal	%	85 (minimum)	--	--	--	1/month	Calculation
Total Suspended Solids (TSS)	mg/L	30	45	--	Influent and Effluent	1/month	Grab
	lb/day	25	38	--			Calculation
TSS Percent Removal	%	85 (minimum)	--	--	--	1/month	Calculation
<i>E. coli</i> ^{1,2}	CFU/100 ml	126	--	406 (instant. max)	Effluent	5/month	Grab
Total Residual Chlorine ^{2,3}	mg/L	0.01	--	0.02	Effluent	1/week	Grab
	lb/day	0.01	--	0.02			Calculation
pH	std units	Between 6.5 – 9.0			Effluent	1/week	Grab
Total Phosphorus ⁴ (as P)	mg/L	--	--	--	Effluent	1/month	Grab
Total Ammonia ⁴ (as N)	mg/L	--	--	--	Effluent	1/month	Grab
Report Parameters							
Flow	mgd	Report	--	Report	Effluent	5/week	Measurement
Temperature ⁴	°C	Report	--	Report	Effluent	1/month	Grab
<u>Notes</u>							
1. The average monthly <i>E. coli</i> counts must not exceed a geometric mean of 126/100 mL based on a minimum of five samples taken every 3-5 days within a calendar month. If the facility does not discharge a sufficient number of days in a given month to obtain five samples, the average monthly limit does not apply for that month.							
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.							
3. The average monthly and maximum daily concentration limits for chlorine are not quantifiable using EPA approved test methods. The permittee will be in compliance with the effluent limits for chlorine provided the average monthly and maximum daily total chlorine residual levels are at or below the compliance evaluation level of 0.1 mg/L, with a loading at or below 0.083 lb/day.							
4. Monitoring shall be conducted once per month starting in 2005 and lasting until a minimum of 10 samples have been collected during the permit cycle.							

Table 5. Draft Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits							
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	--	Influent and Effluent	1/month	Grab ¹
	lb/day	25	38	--			
BOD ₅ Percent Removal	%	85 (minimum)	--	--	--	1/month	Calculation ²
Total Suspended Solids (TSS)	mg/L	30	45	--	Influent and Effluent	1/month	Grab ¹
	lb/day	25	38	--			
TSS Percent Removal	%	85 (minimum)	--	--	--	1/month	Calculation ²
<i>E. coli</i> ^{3,5}	CFU/100 ml	126	--	406 (instant. max) ⁵	Effluent	5/month	Grab
Total Residual Chlorine ^{4,5}	mg/L	0.01	--	0.02 ⁵	Effluent	1/week	Grab ¹
	lb/day	0.01	--	0.02 ⁵			
pH	std units	Between 6.5 – 9.0			Effluent	1/week	Grab
Floating, Suspended, or Submerged Matter	--	See Paragraph I.B.2 of this permit				1/month	Visual Observation
Report Parameters							
Flow	mgd	Report	--	Report	Effluent	Continuous ⁷	Measurement
Temperature	°C	Report	--	Report	Effluent	1/month	Grab
Total Ammonia (as N)	mg/L	Report	--	Report	Effluent	1/month	Grab
Effluent Testing for Permit Renewal							
Permit Application Effluent Testing Data ⁶		--			Effluent	1/year	--

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
<u>Notes</u>							
1. Loading (in lb/day) is calculated by multiplying the concentration (in mg/L) by the corresponding flow (in mgd) for the day of sampling by a conversion factor of 8.34. For more information on calculating, averaging, and reporting loads and concentrations see the <i>NPDES Self-Monitoring System User Guide</i> (EPA 833-B-85-100, March 1985). 2. Percent Removal. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month using the following equation: (average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration x 100. Influent and effluent samples must be taken over approximately the same time period. 3. The average monthly <i>E. coli</i> 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. See Part VI of this permit for a definition of geometric mean. 4. The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L. The EPA will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limitations if the average monthly and maximum daily concentrations are less than 50 µg/L and the average monthly and maximum daily mass loadings are less than 0.125 lb/day. For purposes of calculating the monthly averages, see Paragraph I.B.7 of this permit. 5. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See Paragraph I.B.3 and Part III.G of this permit. 6. Effluent Testing Data - See NPDES Permit Application Form 2A, Part A.12 for the list of pollutants to be included in this testing. The Permittee must use sufficiently sensitive analytical methods in accordance with Part I.B.5 of the permit. 7. Continuous monitoring for flow should only be recorded when discharge occurs.							

A. Basis for Effluent Limits

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

B. Pollutants of Concern

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

- Have a technology-based limit
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring
- Are expected to be in the discharge based on the nature of the discharge

The wastewater treatment process for this facility includes both primary and secondary treatment, as well as disinfection with chlorination. Pollutants of concern expected in the discharge from this facility are: five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), *E. coli* bacteria, total residual chlorine (TRC), pH, and ammonia.

C. Technology-Based Effluent Limits***Federal Secondary Treatment Effluent Limits***

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as “secondary treatment,” which POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated “secondary treatment” effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to certain municipal WWTFs and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD₅, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table 6. For additional information and background refer to Part 5.1 *Technology Based Effluent Limits for POTWs* in the Permit Writers Manual.

Table 6. Secondary Treatment Effluent Limits

Parameter	30-day average	7-day average
BOD ₅	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
Removal for BOD ₅ and TSS (concentration)	85% (minimum)	---
pH	within the limits of 6.0 - 9.0 s.u.	
Source: 40 CFR 133.102		

Mass-Based Limits

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

$$\text{Mass based limit (lb/day)} = \text{Concentration limit (mg/L)} \times \text{Design flow (mgd)} \times 8.34^1$$

Since the design flow for this facility is 0.1 mgd, the technology-based mass limits for BOD₅ and TSS are calculated as follows:

$$\text{Average Monthly Limit} = 30 \text{ mg/L} \times 0.1 \text{ mgd} \times 8.34 = 25 \text{ lb/day}$$

$$\text{Average Weekly Limit} = 45 \text{ mg/L} \times 0.1 \text{ mgd} \times 8.34 = 38 \text{ lb/day}$$

The concentration and removal rate limits for BOD₅ and TSS are the technology-based effluent limits of 40 CFR 133.102.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The City of Carey uses chlorine disinfection. A technology-based average monthly limit for chlorine of

¹ 8.34 is a conversion factor with units (lb × L)/(mg × gallon × 10⁶)

0.5 mg/L is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment facility can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment facility that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. For technology-based effluent limits, the AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD₅ and TSS. This results in an AWL for chlorine of 0.75 mg/L.

D. Water Quality-Based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. The NPDES regulation 40 CFR 122.44(d)(1) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation for the discharge in an approved TMDL. If there are no approved TMDLs that specify wasteload allocations for this discharge; all of the water quality-based effluent limits are calculated directly from the applicable water quality standards.

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

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

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

pH

The Idaho water quality standards at IDAPA 58.01.02.250.01.a, require pH values of the river to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. Effluent pH data were compared to the water quality criteria. A review of the facility's effluent pH data showed no exceedances of the pH standard. Since the WQBEL is more stringent than the TBEL, the WQBEL within the range of 6.5 - 9.0 s.u. has been included in the draft permit.

E. coli

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

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

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

Regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits, unless impracticable. Additionally, the terms "average monthly limit" and "average weekly limit" are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are "derived from and comply with" the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Chlorine

The Idaho state water quality standards 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 calculation showed that the discharge from the facility would have the reasonable potential to cause or contribute to a violation of the water quality criteria for chlorine. The water quality-based effluent limits are 0.01 mg/L and 0.01 lb/day for the AMLs, and 0.02 mg/L and 0.02 lb/day for the MDLs. These limits are included in the draft permit because they are more stringent than the technology-based limits. See Appendix C for reasonable potential and effluent limitation calculations for chlorine.

Ammonia

Ammonia is a pollutant of concern based on the facility type. However, because the receiving water is typically dry and the facility does not regularly discharge to the river, there are insufficient data to conduct a reasonable potential analysis for ammonia. The facility monitoring requirements are being retained in the draft permit to gather more data.

Residues

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

E. Antibacksliding

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual *Final Effluent Limitations and Anti-backsliding*.

The limits in the draft permit remain unchanged from the existing permit, therefore antibacksliding does not apply.

VI. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

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

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

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

B. Effluent Monitoring

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

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

Monitoring Changes from the Previous Permit

During periods of discharge, the effluent flow monitoring changed from 5 times per week to continuous to provide better estimates of daily discharges, irrespective of what time of day the grab samples were taken.

The surface water monitoring requirement for phosphorus was removed because the segment of the river to which they discharge was delisted for impairments due to sedimentation, nutrients, bacteria, and temperature in the 2008 Integrated Report.

C. Surface Water Monitoring

In general, surface water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, surface water monitoring may be required for pollutants for which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body. Table 7 presents the proposed surface water monitoring requirements for the draft permit.

The existing permit requires surface water monitoring when the facility is discharging and collecting effluent samples. However, because the facility rarely discharges and there was no flow in the receiving water during discharges, no surface water samples were collected. So that surface water data are available to inform development of future reasonable potential analyses and permit limits, the draft permit is proposing to require surface water monitoring monthly when there is flow in the receiving water until 12 samples are collected. Surface water monitoring results must be submitted with the next permit renewal application, which is due at least 180 days prior to the expiration date of the permit.

Table 7. Surface Water Monitoring in Draft Permit

Parameter	Units	Frequency	Sample Type
Total Ammonia as N	mg/L	1/month ^{1,2}	Grab
Temperature	°C	1/month ^{1,3}	Grab
pH	standard units	1/month ^{1,3}	Grab
Flow	cfs	1/month ^{1,3}	Measured
Notes: 1. Sampling shall occur whenever the river is flowing. 2. Upstream monitoring for ammonia shall be conducted once per month and continue until a total of 12 samples have been collected, and be submitted with the permit renewal application. These samples should be taken concurrently with monthly pH and temperature samples. 3. Monitoring shall be conducted once per month and continue until a total of 12 samples have been collected during the permit cycle.			

D. Electronic Submission of Discharge Monitoring Reports

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

The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: <https://netdmr.zendesk.com/hc/en-us>. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

VII. Sludge (Biosolids) Requirements

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

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

VIII. Other Permit Conditions**A. Quality Assurance Plan**

The City of Carey is required to update the Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan must include standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the IDEQ upon request.

B. Operation and Maintenance Plan

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

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

Sanitary sewer overflows (SSOs) are not authorized under this permit. The permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification of SSOs. Finally, the permit requires proper operation and maintenance of the collection system.

The following specific permit conditions apply:

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

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

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

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

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

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

D. Environmental Justice

As part of the permit development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

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

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

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

E. Design Criteria

The permit includes facility planning requirements. This provision requires the permittee to compare influent flow and loading to the facility's design flow and loading and prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the flow exceeds the facility planning value of 0.1 mgd for any 2 months during a 12 month period. The City of Carey WWTF discharges effluent at an average rate of 0.04 mgd, well below the design capacity of 0.1 mgd.

F. Pretreatment Requirements

Idaho does not have an approved state pretreatment program per 40 CFR 403.10, thus, EPA is the Approval Authority for Idaho POTWs. Since the City of Carey does not have an approved POTW pretreatment program per 40 CFR 403.8, the EPA is also the Control Authority of industrial users that might introduce pollutants into the City of Carey WWTF.

Special Condition II.C. of the permit reminds the Permittee that it cannot authorize discharges which may violate the national specific prohibitions of the General Pretreatment Program. To help ensure the POTW is aware of any industrial users (i.e. nondomestic sources of indirect discharges), including significant industrial users, special condition II.C. requires a permittee to develop and maintain a list of industrial users in its service area within 2 years of the effective date of the permit.

Although, not a permit requirement, the Permittee may wish to consider developing the legal authority enforceable in Federal, State or local courts which authorizes or enables the POTW to apply and to enforce the requirement of sections 307 (b) and (c) and 402(b)(8) of the Clean Water Act, as described in 40 CFR 403.8(f)(1). Where the POTW is a municipality, legal authority is typically through a sewer use ordinance, which is usually part of the city or county code. The EPA has a Model Pretreatment Ordinance for use by municipalities operating POTWs that are required to develop pretreatment programs to regulate industrial discharges to their systems (EPA, 2007). The model ordinance should also be useful for

communities with POTWs that are not required to implement a pretreatment program in drafting local ordinances to control nondomestic dischargers within their jurisdictions.

G. Standard Permit Provisions

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

IX. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. An official species list was requested from the USFWS via the IPaC website (<https://ecos.fws.gov/ipac/>) on September 25, 2017, and the response stated that there are no threatened, endangered, or candidate species, or critical habitats within the vicinity of the Carey WWTF. Therefore, the EPA concludes that this permitting action will have no effect on any threatened or endangered species.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH). A review of EFH habitat using the NOAA EFH Mapper website (<http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html>) on September 25, 2017, shows that there is no EFH habitat within the vicinity of the Carey WWTF. Therefore, the EPA concludes that this permitting action will have no effect on EFH.

C. State Certification

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

D. Antidegradation

The IDEQ has completed an antidegradation review which is included in the draft 401 certification for this permit in Appendix D. The EPA has reviewed this antidegradation analysis and finds that it is consistent with the State's water quality standards and the State's antidegradation implementation procedures. Comments on the 401 certification including the antidegradation review can be submitted to the IDEQ as set forth above (see State Certification on Page 1 of this Fact Sheet).

E. Permit Expiration

The permit will expire five years from the effective date.

X. References

DEQ. 2017. *Idaho's 2014 Integrated Report – Final*. Online at:

<http://www.deq.idaho.gov/media/60179654/idaho-2014-integrated-report.pdf>

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

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

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

U.S. Census Bureau. Community Facts. Online at:

https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml#

Appendix A. Facility Information

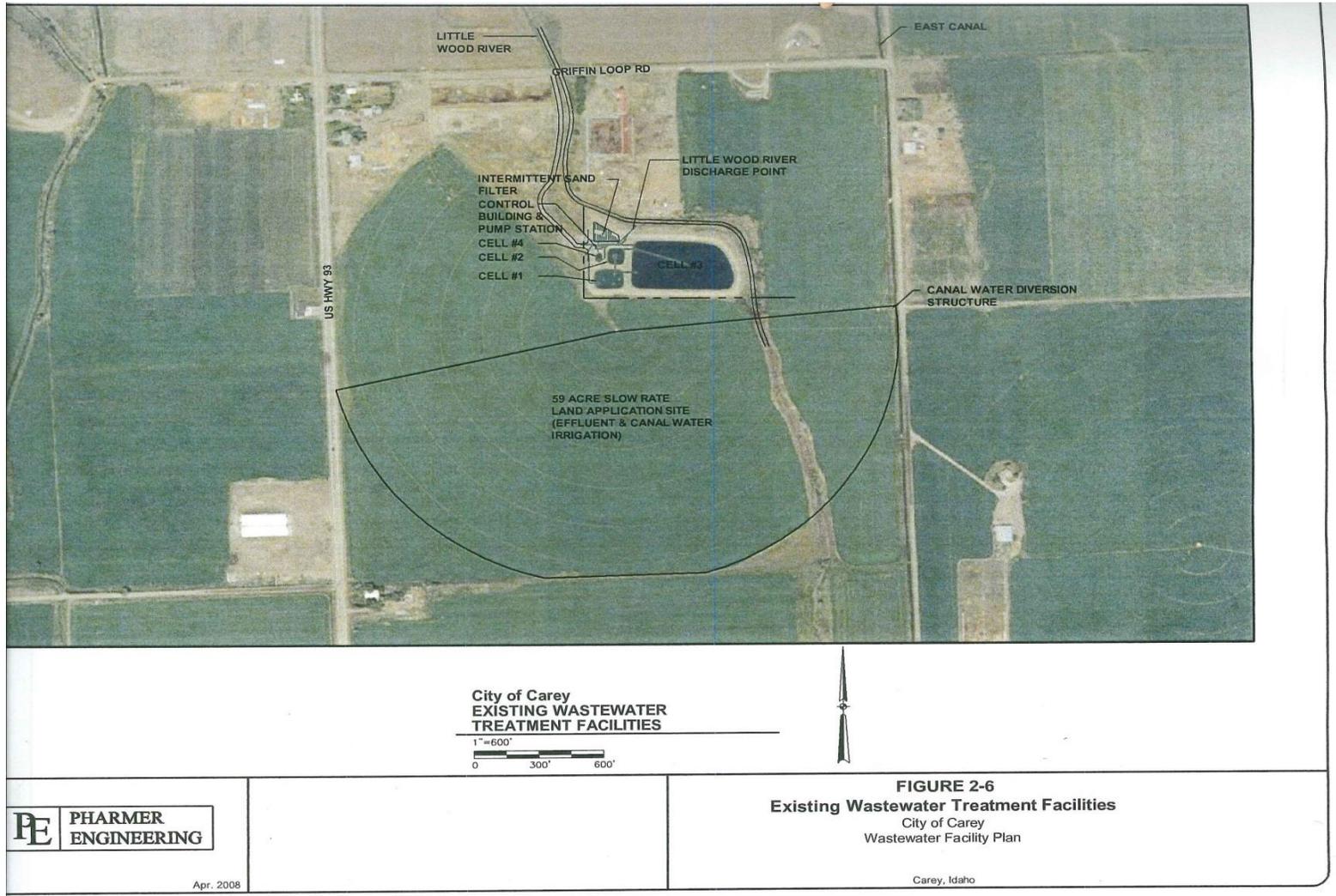


Figure 1. City of Carey Wastewater Treatment Facility.

NPDES Permit #ID0025747
 City of Carey Wastewater Treatment Facility

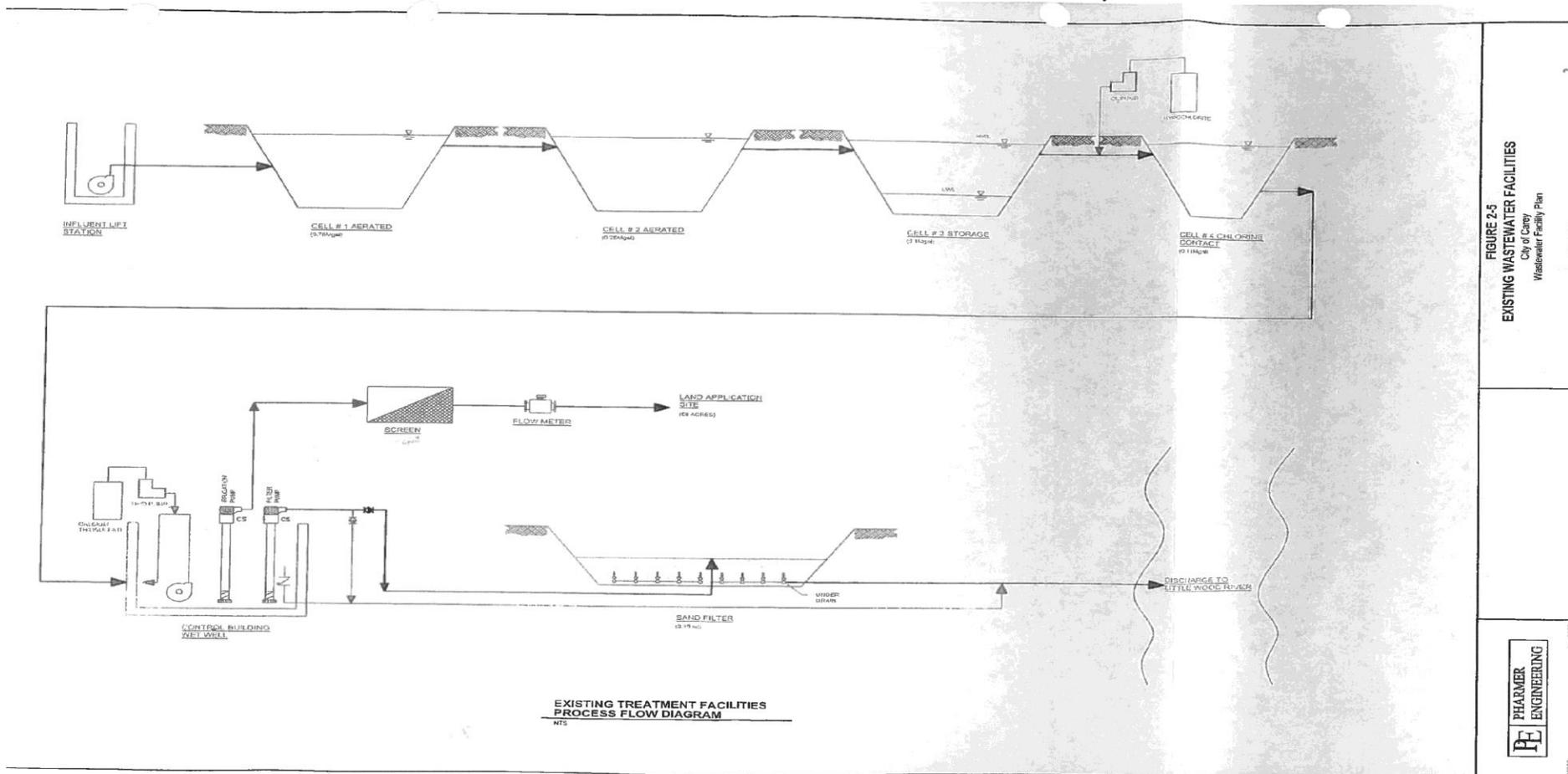


Figure 2. City of Carey Process Flow Diagram.

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

A. Reasonable Potential Analysis

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

Mass Balance

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

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

where,

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

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

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

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

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

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

Where:

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

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

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

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

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

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

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

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as follows:

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

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

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

Maximum Projected Effluent Concentration

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

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

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

where,

p_n = the percentile represented by the highest reported concentration

n = the number of samples

confidence level = 99% = 0.99

and

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

Where,

σ^2 = $\ln(\text{CV}^2 + 1)$

Z_{99} = 2.326 (z-score for the 99th percentile)

Z_{P_n} = z-score for the P_n percentile (inverse of the normal cumulative distribution function at a given percentile)

CV = coefficient of variation (standard deviation ÷ mean)

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

$$C_e = (\text{RPMF})(\text{MRC}) \quad \text{Equation 10}$$

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

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

Reasonable Potential

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

B. WQBEL Calculations

Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis. To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e . The calculated C_e is the acute or chronic WLA. Equation 6 is rearranged to solve for the WLA, becoming:

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

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, the EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation 12. As discussed in Appendix B, the criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

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

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

$$\text{LTA}_a = \text{WLA}_a \times e^{(0.5\sigma^2 - z\sigma)} \quad \text{Equation 13}$$

$$\text{LTA}_c = \text{WLA}_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \quad \text{Equation 14}$$

where,

$$\sigma^2 = \ln(\text{CV}^2 + 1)$$

$$\begin{aligned} Z_{99} &= 2.326 \text{ (z-score for the 99}^{\text{th}} \text{ percentile probability basis)} \\ CV &= \text{coefficient of variation (standard deviation } \div \text{ mean)} \\ \sigma_4^2 &= \ln(CV^2/4 + 1) \end{aligned}$$

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

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

where,

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

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

Derive the maximum daily and average monthly effluent limits

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

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

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

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

$$\begin{aligned} \sigma_n^2 &= \ln(CV^2/n + 1) \\ z_a &= 1.645 \text{ (z-score for the 95}^{\text{th}} \text{ percentile probability basis)} \\ z_m &= 2.326 \text{ (z-score for the 99}^{\text{th}} \text{ percentile probability basis)} \\ n &= \text{number of sampling events required per month. With the exception of ammonia, if the AML is based on the } LTA_c, \text{ i.e., } LTA_{\text{minimum}} = LTA_c, \text{ the value of "n" should be set at a minimum of 4. For ammonia, if the AML is based on the } LTA_c, \text{ i.e., } LTA_{\text{minimum}} = LTA_c, \text{ the value of "n" is set at a minimum of 30.} \end{aligned}$$

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

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

Facility Name	City of Carey
Facility Flow (mgd)	0.10
Facility Flow (cfs)	0.15

Pollutants of Concern			CHLORINE (Total Residual)
Effluent Data	Number of Samples in Data Set (n)		4
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		500
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only		
Receiving Water Data	90th Percentile Conc., µg/L - (C_u)		
	Geometric Mean, µg/L, Human Health Criteria Only		
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	19.
	Aquatic Life Criteria, µg/L	Chronic	11.
	Human Health Water and Organism, µg/L		--
	Human Health, Organism Only, µg/L		--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	--
		Chronic	--
	Carcinogen (Y/N), Human Health Criteria Only		--
Percent River Flow Default Value = 0%	Aquatic Life - Acute	1Q10	0%
	Aquatic Life - Chronic	7Q10 or 4B3	0%
		30B3 or 30Q10	0%
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	0%
	Human Health - Carcinogen	Harmonic Mean	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	1.0
	Aquatic Life - Chronic	7Q10 or 4B3	1.0
		30B3 or 30Q10	1.0
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	1.0
	Human Health - Carcinogen	Harmonic Mean	1.0

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2 = \ln(CV^2 + 1)$	0.555
P_n	$= (1 - \text{confidence level})^{1/n}$, where confidence level = 99%	0.316
Multiplier (TSD p. 57)	$= \exp(z\sigma - 0.5\sigma^2) / \exp(\text{normsinv}(P_n)\sigma - 0.5\sigma^2)$, where 99%	4.7
Statistically projected critical discharge concentration (C _e)		2368.01
Predicted max. conc. (ug/L) at Edge-of-Mixing Zone <small>(note: for metals, concentration as dissolved using conversion factor as translator)</small>	Acute	2368.01
	Chronic	2368.01
Reasonable Potential to exceed Aquatic Life Criteria		YES

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)		4	
LTA Coeff. Var. (CV), decimal (Use CV of data set or default = 0.6)		0.600	
Permit Limit Coeff. Var. (CV), decimal (Use CV from data set or default = 0.6)		0.600	
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a - 1)$	Acute	19.0
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c - 1)$	Chronic	11.0
Long Term Ave (LTA), ug/L	$WLA_c \times \exp(0.5\sigma^2 - z\sigma)$, Acute	99%	6.1
(99 th % occurrence prob.)	$WLA_a \times \exp(0.5\sigma^2 - z\sigma)$; ammonia n=30, Chronic	99%	5.8
Limiting LTA, ug/L	used as basis for limits calculation		5.8
Applicable Metals Criteria Translator (metals limits as total recoverable)			--
Average Monthly Limit (AML), ug/L, where % occurrence prob =		95%	9
Maximum Daily Limit (MDL), ug/L, where % occurrence prob =		99%	18
Average Monthly Limit (AML), mg/L			0.009
Maximum Daily Limit (MDL), mg/L			0.018
Average Monthly Limit (AML), lb/day			0.008
Maximum Daily Limit (MDL), lb/day			0.015

Appendix D. CWA 401 State Certification



Idaho Department of Environmental Quality Draft §401 Water Quality Certification

March 5, 2018

NPDES Permit Number(s): ID0025747 City of Carey WWTF

Receiving Water Body: Little Wood River

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

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

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

Antidegradation Review

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

- **Tier I Protection.** The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- **Tier II Protection.** The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- **Tier III Protection.** The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

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

Pollutants of Concern

The City of Carey WWTF discharges the following pollutants of concern: five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), *E. coli* bacteria, total residual chlorine (TRC), pH, and ammonia. Effluent limits have been developed for BOD₅, TSS, *E. coli* bacteria, TRC, and pH. No effluent limits are proposed for ammonia.

Receiving Water Body Level of Protection

The City of Carey WWTF discharges to the Little Wood River within the Little Wood Subbasin assessment unit (AU) ID17040221SK003_05 (West Canal (north) to West Canal (south)). This AU has the following designated beneficial uses: cold water aquatic life, salmonid spawning, and primary contact recreation. In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2014 Integrated Report, this AU is not supporting one or more of its assessed uses. The aquatic life and salmonid spawning uses are not supporting due to low flow alteration. The contact recreation beneficial use is fully supporting. As such, DEQ will provide Tier I protection (IDAPA 58.01.02.051.01) for the aquatic life and salmonid spawning uses, and Tier II protection (IDAPA 58.01.02.051.02) in addition to Tier I for the contact recreation use.

Protection and Maintenance of Existing Uses (Tier I Protection)

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

In sum, the effluent limitations and associated requirements contained in the City of Carey WWTF permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and technology based effluent limits. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Little Wood River in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

High-Quality Waters (Tier II Protection)

The Little Wood River is considered high quality for primary contact recreation. As such, the water quality relevant to primary contact recreation use of the Little Wood River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to primary contact recreation uses of the Little Wood River (IDAPA 58.01.02.052.05). These include the following: *E. coli*. Effluent limits are set in the proposed and current permit for all this pollutant.

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

Pollutants with Limits in the Current and Proposed Permit

For pollutants that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). Table 1 provides a summary of the current permit limits and the proposed or reissued permit limits.

Table 1. Comparison of current and proposed permit limits for pollutants of concern relevant to uses receiving Tier II protection.

Pollutant	Units	Current Permit			Proposed Permit			Change ^a
		Average Monthly Limit	Average Weekly Limit	Max Daily Limit	Average Monthly Limit	Average Weekly Limit	Max Daily Limit	
Pollutants with limits in both the current and proposed permit								
Five-Day BOD	mg/L	30	45	---	30	45	---	NC
	lb/day	25	38	---	25	38	---	
	% removal	85 Avg Mon minimum ^b			85 Avg Mon minimum ^b			
TSS	mg/L	30	45	---	30	45	---	NC
	lb/day	25	38	---	25	38	---	
	% removal	85 Avg Mon minimum ^b			85 Avg Mon minimum ^b			
pH	standard units	6.5–9.0 all times			6.5–9.0 all times			NC
<i>E. coli</i>	no./100 mL	126 ^c	---	406 ^c	126 ^c	---	406 ^c	NC
Total Residual Chlorine ^d	mg/L	0.01	--	0.02	0.01	---	0.02	NC

^a NC = No Change, I = Increase, D = Decrease.

^b Percent Removal. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month using the following equation:

(average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration x 100. Influent and effluent samples must be taken over approximately the same time period.

^c 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. The 406 cfu/100 mL is an instantaneous maximum. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.

^d The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for

chlorine is 50 µg/L. The EPA will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limitations if the average monthly and maximum daily concentrations are less than 50 µg/L and the average monthly and maximum daily mass loadings are less than 0.125 lb/day.

In the current permit, monitoring for total phosphorus shall be conducted once per month starting in 2005 and lasting until a minimum of 10 samples have been collected during the permit cycle. For the proposed permit, total phosphorus was removed from the effluent monitoring because the receiving water is not impaired for that pollutant based on the 2014 Integrated Report. In the current permit, flow was measured 5 times per week. In the proposed permit, flow monitoring should be continuously monitored when discharge occurs.

For the proposed permit, because the receiving water is typically dry and the facility does not regularly discharge to the river, there is insufficient data to conduct a reasonable potential analysis for ammonia. The facility monitoring requirements are being retained in the proposed permit to gather more data.

Pollutants with No Limits

There is one pollutant of concern, ammonia, relevant to Tier II protection of recreation that currently is not limited and for which the proposed permit also contains no limit (Table 1). For such pollutants, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.06.a.ii). With respect to ammonia, there is no reason to believe this pollutant will be discharged in quantities greater than those discharged under the current permit. This conclusion is based upon the fact that there have been no changes in the design flow, influent quality, or treatment processes that would likely result in an increased discharge of this pollutant. Because the proposed permit does not allow for any increased water quality impact from this pollutant, DEQ has concluded that the proposed permit should not cause a lowering of water quality for the pollutant with no limit. As such, the proposed permit should maintain the existing high water quality in Little Wood River.

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

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

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

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative

Procedure before the Board of Environmental Quality” (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to Balthasar B. Buhidar, Twin Falls Regional Office, (208) 736-2190, or at Balthasar.buhidar@deq.idaho.gov.

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David Anderson
Regional Administrator
Twin Falls Regional Office