Fact Sheet

Public Comment Start Date: October 31, 2014
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The United States Environmental Protection Agency (EPA)
Proposed Reissuance of a National Pollutant Discharge Elimination System (NPDES)
Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA)

City of Worley, Idaho
Wastewater Treatment Plant
NPDES Permit No. ID0022713

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

This Fact Sheet includes:
- General facility information (40 CFR 124.8, 124.56)
- Summary and rationale of permit conditions (40 CFR 124.8)
- Detailed rationale of permit conditions (40 CFR 124.56, 124.8)
- Administrative requirements (40 CFR 124.8)

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 EPA as described in the Public Comments section of the attached Public Notice.

After the public comment period expires, and all comments have been considered, EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments have been received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If substantive comments have been received, 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 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 permit, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at "http://epa.gov/r10earth/waterpermits.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-0523 or
Toll Free (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

EPA Coeur d'Alene Field Office
1910 Northwest Blvd., Suite 208
Coeur d'Alene, ID 83814
(208)769-1422

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Acronyms

1Q10	1-day, 10-year low flow
7Q10	7-day, 10-year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
AML	Average Monthly Limit
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
EFH	Essential fish habitat
HUC	Hydrologic Unit Code
IDEQ	Idaho Department of Environmental Quality
lbs/day	Pounds per day
LTA	Long-Term Average
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
POTW	Publicly owned treatment works
RPA	Reasonable Potential Analysis
RPM	Reasonable Potential Multiplier

RWC	Receiving Water Concentration
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

This fact sheet provides information on the draft National Pollutant Discharge Elimination System (NPDES) permit for the following entity:

Facility Name: City of Worley
NPDES Permit # ID0022713

Physical Address:
S 29401 B. Street
Worley, Idaho 83876

Mailing Address:
P.O. Box 219
Worley, Idaho 83876

Contact:
Brenda Morris
Facility Operator

B. Permit History

The most recent NPDES permit for the City of Worley was issued on November 17, 2003, and became effective on November 24, 2003, with an expiration date of November 24, 2008. The permit was modified on October 7, 2008, to extend the seasonal discharge period from January-April to November 1st through June 30th. An NPDES application for permit reissuance was submitted by the permittee on May 20, 2008. The U.S. Environmental Protection Agency (EPA) determined that the application was timely and complete. Therefore, pursuant to 40 Code of Federal Regulations (CFR) 122.6, the permit has been administratively continued and the terms of the permit remain fully effective and enforceable.

II. Facility Information

A. Treatment Plant Description

The City of Worley owns, operates, and maintains the City of Worley Wastewater Treatment Plant (Worley WWTP) located in Worley, Idaho. It is located on Tribal Lands and discharges to waters of the Coeur d'Alene Tribe. The Worley WWTP provides secondary treatment of municipal wastewater through a system comprising of a waste stabilization pond (lagoon) followed by chlorination for pathogen disinfection. The collection system has no combined sewers. The facility serves a resident population of 530. The design flow of the facility is 0.0571 million gallons per day (mgd). According to the discharge monitoring report (DMR) data, the facility consistently discharges above the design flow. Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendices A and B, respectively.

B. Background Information

Effluent Characterization
The City of Worley's sewage collection system receives raw sewage from homes and businesses, and does not include discharge from industrial users. The treatment process at the facility includes a waste stabilization (lagoon) system followed by disinfection with chlorine. Pollutants typical of a sewage treatment plant treating with chlorine would be expected in the discharge, including five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), *E. coli* bacteria, total residual chlorine (TRC), pH, ammonia, temperature, phosphorus, and dissolved oxygen (DO). The concentrations of pollutants in the discharge were reported in the NPDES application and in DMRs and were used in determining reasonable potential for several parameters (see Appendix D). The existing permit does not require monitoring for DO, phosphorus, or temperature but due to the nature of the discharge, these parameters are also considered pollutants of concern.

Facility Compliance
According to the facility operators, there is a significant inflow and infiltration problem, which they are working to address. The issue has led to difficulty in meeting some permit limits. The permit requires a reduction in BOD of 85%, but according to DMR information the facility has had percent removal rates less than 85% seven times over the last five years. The facility has had difficulty meeting the 85% reduction limit for TSS, with percent removal rates lower than 85% three times over the last five years.

The facility has exceeded *E. coli* limits twice in the last five years. In addition, the facility is discharging above the design flow capacity.

EPA conducted inspections of the wastewater treatment plant in 2007, 2008, and 2012 and found several deficiencies. With the exception of the inflow and infiltration/removal efficiency issue, all of the deficiencies identified have been resolved, including the development of a Quality Assurance Plan in 2008, correction of sample handling, and updating of the Operation and Maintenance Plan.

Discharge Restrictions
Under the existing and draft permit, the facility is only authorized to discharge from November 1st through June 30th provided the flow in North Rock Creek provides a 10:1 dilution ratio. Over the past several years, the facility has only discharged during the months of January through the end of May.

III. Receiving Water

This facility discharges to North Fork Rock Creek in the City of Worley, Idaho, at 47° 24' 28.08 N, 116° 55' 15.04 W. This facility is located within the exterior boundaries of the Coeur d'Alene Tribe Indian Reservation. The North Fork of Rock Creek flows into Washington State approximately seven miles downstream from the outfall. Hangman Creek is a major tributary to the Spokane River.

Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and recommends the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling.

For North Fork Rock Creek, no data on stream flow were available and the stream is dry for at least a portion of the year as confirmed through aerial photography. Because of this zero low flow, and in keeping with the existing permit, the water quality-based effluent limits are based on providing a minimum dilution in the receiving water of 10:1. The requirement to have a minimum dilution of 10:1 in the receiving water is retained in the permit.

A. Water Quality Standards

Overview

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

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

Tribal Water Quality Standards

The Coeur d'Alene Tribe has Treatment as a State (TAS) for CWA purposes for portions of the Reservation, these waters are referred to as Reservation TAS waters. The Tribe implements the water quality standards program and has EPA-approved water quality standards for the reservation TAS waters. Although the facility is located within the exterior boundaries of the Coeur d'Alene Reservation, the receiving water to which the facility discharges, is not a Reservation TAS water.

The EPA believes it is appropriate to consider the Coeur d'Alene Tribal WQS, the State of Idaho WQS and the State of Washington WQS in determining the applicable designated uses and criteria for North Fork Rock Creek. For the parameters of concern in this permit, the Coeur d'Alene WQS are comparable to those of the two states. Washington WQS for TRC and ammonia for aquatic life criteria are identical to Idaho WQS. Limits in the draft permit should ensure that Washington WQS are met for these parameters in North Fork Rock Creek at the Idaho-Washington border.

Designated Beneficial Uses

The facility discharges to the North Fork Rock Creek (Hangman Subbasin Hydrologic Unit Code [HUC] 00017010306031), within the exterior boundaries of the Coeur d'Alene Indian Reservation.

All Reservation TAS Waters not specifically classified are designated for aquatic life uses

and for recreational and cultural uses. In addition, all Reservation TAS Waters are designated for the uses of industrial water supply, aesthetics, and wildlife habitat (*See* Tribal WQS Section 20).

Surface Water Quality Criteria

The most pertinent water quality criteria for Reservation TAS waters are found in the following sections of the Coeur d'Alene WQS:

- Protection of industrial water supply, aesthetics, and wildlife habitat are in General Conditions (Section 3) and the Narrative Criteria (Section 5).
  - The Tribe does not have numeric water quality criteria for nutrients (i.e. total phosphorus and total nitrogen), however, the Tribe does have a narrative criterion for nutrients, which reads, "nutrients or other substances from anthropogenic causes shall not be present in concentrations which will produce objectionable algal densities or nuisance aquatic vegetation, result in a dominance of nuisance species, or otherwise cause nuisance conditions."
  - The Tribe has a narrative criteria that requires waters to be free from substances attributable to point source discharges in accordance with the following: Floating Solids, Oil and Grease: All waters shall be free from visible oils, scum, foam, grease, and other floating materials and suspended substances of a persistent nature resulting from anthropogenic causes.
- Protection of domestic water supply, recreational and cultural use, and aquatic life uses are in Sections 7 (Toxic Substances) and 19 (Specific Water Quality Criteria for Use Classifications)
  - The Tribe's ammonia and TRC criteria are identical to that of Idaho and Washington. However, the EPA disapproved the Tribe's ammonia criteria. The Tribe's adopted criteria were based on EPA's 1999 recommended criteria, which did not take into consideration ammonia toxicity to certain kinds of freshwater mussels and snails. EPA has since updated its national recommendation for ammonia in response to new mussel and snail sensitivity data, and published final revised criteria in the Federal Register on August 12, 2013. The Tribe anticipates adopting revised ammonia criteria to protect freshwater aquatic life based on EPA's latest recommendations.
  - Protection of recreational and cultural uses include criteria for *E. coli* bacteria.
  - Mixing Zones (Section 12)
  - Biological Criteria (Section 9)
  - Antidegradation Policy (Section 6)

B. Water Quality Limited Waters

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

The allocations for point sources, known as "waste load allocations" (WLAs), are implemented through effluent limitations in NPDES permits. Effluent limitations for point sources must be consistent with applicable TMDL allocations.

The North Fork Rock Creek is not listed as water quality limited, although downstream waters in Washington are impaired for bacteria, temperature, turbidity, nutrients, pH, and oxygen. Washington Department of Ecology (Ecology) completed a TMDL for bacteria, temperature, and turbidity for the Hangman Creek Watershed entitled *Hangman (Latah) Creek Watershed Fecal Coliform Bacteria, Temperature, and Turbidity Total Maximum Daily Load Water Quality Implementation Plan* (Ecology, 2011) (*Hangman Creek TMDL*). The *Hangman Creek TMDL* does not provide WLAs for point sources on the Reservation, but may set an allocation at the border with the Reservation.

Dissolved oxygen and pH impairments are typically the result of excess nutrients like nitrogen and phosphorus. *The Spokane River and Lake Spokane Dissolved Oxygen TMDL* (Ecology, February 2010) (*Spokane River TMDL*) established phosphorus load allocations at the mouth of Hangman Creek, but it did not allocate loading to sources within the Hangman Creek watershed. Early development of a nutrient TMDL for Hangman Creek focused on meeting the phosphorus load allocation established at the mouth of Hangman Creek. However, further analysis indicated that some tributaries in the Hangman Watershed are phosphorus limited and some are nitrogen limited. At this time, it is not certain which nutrient pollutant is of more concern for Rock Creek (nitrogen or phosphorus).

Ecology collected water quality data on dissolved oxygen, pH, and nutrients in the watershed. This data will be used to develop a separate TMDL to address these parameters. The TMDL will set an allocation for Rock Creek at the border.

The EPA considered the *Hangman Creek TMDL, Spokane River TMDL* and downstream impairments in determining permit conditions for the Worley WWTP. See Appendix C.

The following is a link to the Ecology webpage for the Hangman Creek subbasin:

http://www.ecy.wa.gov/programs/wq/tmdl/HangmanCr/index.html

IV. Effluent Limitations

A. Basis for Effluent Limitations

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

B. Proposed Effluent Limitations

Below are the proposed effluent limits that are in the draft permit.

Narrative limitations to protect the Tribe's narrative criteria for floating solids, oil and

grease:

> Except as specifically authorized in Table 1, the permittee must not discharge visible oils, scum, foam, grease, or other floating materials and suspended substances.

Table 1 presents the proposed average monthly, average weekly, and maximum daily effluent limits.

Table 1 Proposed Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day Biochemical Oxygen Demand (BOD_5)[1,2]	mg/L	30	45	—
	lbs/day	14.3	21.4	
	% removal	85% (min)	—	—
Total Suspended Solids (TSS)[1,2]	mg/L	30	45	
	lbs/day	14.3	21.4	
	% removal	85% (min)	—	—
pH	standard units (s.u.)	6.5 – 8.5		
E. Coli Bacteria[3]	CFU/100 ml	126[2]	—	235 instantaneous max limit
Total Residual Chlorine [4, 5]	mg/L	0.019	—	0.038
	lbs/day	0.0090	—	0.018
Ammonia	mg/L	12.8	—	33.5
	lbs/day	6.1	—	15.9

1. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834.
2. Percent removal for concentration is calculated using the following equation:
   (average monthly influent – average monthly effluent) ÷ average monthly influent
3. The permittee must report the geometric mean *E. coli* concentration.
4. For purposes of calculating monthly averages for TRC, zero may be assigned for values less than the method detection limit (MDL) (0.01 mg/L), and the numeric value of the MDL (0.01 mg/L) may be assigned for values between the MDL and the minimum level (ML) (0.05 mg/L). If the average value is less than the MDL, the permittee must report "less than 0.01 mg/L," and if the average value is less than the ML, the permittee must report "less than 0.05 mg/L." If a value is equal to or greater than the ML, the permittee must report and use the actual value. The resulting average value must be compared to the compliance level, the ML, in assessing compliance.
5. Any sample analyzed in accordance with a method having the appropriate MDL and ML and found to be below the ML will be considered in compliance with the permit limits unless other monitoring information indicates a violation.

C. Changes in Limits from the Existing Permit

Table 2 illustrates the changes in effluent limits from the existing permit. Effluent limitations in the existing permit were erroneously based on a design flow of 0.571 mgd instead of the actual design flow of 0.0571 mgd. The actual design flow of 0.0571 mgd was identified in the permit application submitted on May 20, 2008, and has been confirmed by EPA. The effluent limits for mass (in lbs/day) in the draft permit differ by one order of magnitude due to the error from the existing permit.

In the existing permit, TRC limits were based on an assessment of available technology and expressed as an average monthly limit of 0.5 mg/L and a maximum daily limit of 0.75 mg/L. Since DMR data showed reported discharge levels exceeding the criteria for TRC, EPA determined that there is reasonable potential for TRC to cause or contribute to an excursion of Idaho's WQS (see Appendix D). Therefore, water quality-based effluent limits were developed for TRC and found to be more stringent than the technology-based limits. The draft permit contains an average monthly limit of 0.019 mg/L and a maximum daily limit of 0.038 mg/L.

An analysis of the data show that the discharge to exceed the ammonia criteria. Therefore, the permit includes new water quality based effluent limits for ammonia.

In the existing permit, the bacteria limits were based on a designation of "secondary contact recreation" for Rock Creek in the Idaho WQS. The draft permit protects for recreational and cultural use. In the Coeur d'Alene WQS, waters designated for recreational and cultural use are not to contain concentrations of *E. coli* bacteria exceeding a 30-day geometric mean of 126 per colonies/100 ml, based on a minimum of 5 samples, and a single sample maximum of 235 colonies/100ml.

Table 2 Changes in Permit: Effluent Limits

Parameter	Existing Permit	Draft Permit
Chlorine	0.5 mg/L Average Monthly Limit (AML)	0.019 mg/L AML
	0.75 mg/L Maximum Daily Limit (MDL)	0.038 mg/L MDL
Ammonia	No limit	6.1 mg/L AML
	No limit	15.9 mg/L MDL
***E. Coli* Bacteria**	126/100 ml Average Monthly Limit (AML)	126/100 ml AML
	576/100 ml Instantaneous Maximum Limit (IML)	235/100 ml IML

D. Compliance Schedule

The NPDES regulations at 40 CFR 122.47 allow permit writers to establish schedules of compliance to provide permittees additional time to achieve compliance with the CWA and applicable regulations. Schedules developed under this provision must require compliance by the permittee as soon as possible, but may not extend the date for final compliance beyond compliance dates established by the CWA. Examples of requirements for which a compliance schedule in an NPDES permit might be appropriate include:

- Pretreatment program development
- Sludge use and disposal program development and implementation
- BMP plan development and implementation
- Compliance with effluent limitations derived from new or revised water quality standards

The City of Worley will be given a compliance schedule to meet new water quality-based effluent limits for TRC. The limits must be met within three years of the effective date of the

permit. The provisions of the compliance schedule are necessary since the facility has not had to comply with such a TRC limit to date and based on current data, the facility cannot meet the limit immediately. The three-year schedule was identified as the shortest possible time period in which the facility could come into compliance with the new limits given the need to complete a technical evaluation, develop an engineering plan, and complete design and construction. An annual report must be submitted documenting compliance with the interim milestones, as identified in the draft permit, as well as progress made toward compliance with the final limit.

E. Permit Modifications

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 122.62, 122.63, 122.64, or 124.5.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and 40 CFR 122.44(i) require monitoring conditions in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine whether 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 Part A of 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 application for renewal as appropriate to EPA.

B. Effluent Monitoring

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

Table 3 presents the proposed effluent monitoring requirements for Worley WWTP. 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 has occurred during the reporting period, "no discharge" shall be reported on the DMR.

Table 3 Influent and Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	Mgd	Effluent	continuous	Recording
Effluent Dilution Ratio	---	--	For each day of discharge	Calculation

Parameter	Units	Sample Location	Sample Frequency	Sample Type
BOD_5	mg/L	Effluent	2/month	Grab
	lbs/day	Effluent	2/month	Calculation[3]
	% Removal	Influent & effluent	--	Calculation[4]
TSS	mg/L	Effluent	2/month	Grab
	lbs/day	Effluent	2/month	Calculation[3]
	% Removal	Influent & effluent	--	Calculation[4]
pH	s.u.	Effluent	1/week	Grab
E. Coli Bacteria	CFU/100 ml	Effluent	5/month[5]	Grab
Temperature	°C	Effluent	1/week	Grab
Chlorine	mg/L	Effluent	1/week	Grab
	lbs/day	Effluent		Grab
Total Ammonia as N	mg/L	Effluent	2/month	Grab
	lbs/day	Effluent		Grab
Total Phosphorus as P	mg/L	Effluent	1/month	Grab
Nitrate plus Nitrite	mg/L	Effluent	1/month	Grab
Total Kjeldahl Nitrogen	mg/L	Effluent	1/month	Grab
Dissolved Oxygen	mg/L	Effluent	1/month	Grab

1. The permittee must visually inspect the effluent once a month for any conditions violating the narrative criteria in Section IV B of the fact sheet.
2. All monitoring required only during periods of discharge by the permittee. If there is no discharge, the permittee must report no discharge on the DMR.
3. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34.
4. Percent removal for concentration is calculated using the following equation:
   (average monthly influent – average monthly effluent) ÷ average monthly influent
5. Geometric Mean Criterion. Waters designated for primary or secondary contact recreation are not to contain *E. coli* bacteria in concentrations exceeding a geometric mean of one hundred twenty-six (126) *E. coli* organisms per one hundred (100) ml based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period. (IDAPA 58.01.02.251.01.a)

Monitoring Changes from the Existing Permit

Monitoring requirements have largely been retained from the existing permit, but for certain parameters increased monitoring is required and for others the sample type has changed. Table 4 presents the monitoring changes from the existing permit.

Monthly monitoring is required for total phosphorus, nitrate plus nitrite, total Kjeldahl nitrogen, and dissolved oxygen. Monitoring requirements were put into place because no data for these parameters were currently available and there is a downstream nutrient impairment for which a TMDL is being developed.

The monitoring sample type for BOD_5, TSS, and ammonia has been changed from an 8-hour, composite to a grab sample. It was determined that the 8-hour composite was not necessary because the long holding time of the lagoon would not cause the discharge to be variable throughout the day. A grab sample was determined to be representative of the effluent. Monitoring of these parameters is increased to twice per month because there is variability throughout the month.

Chlorine effluent monitoring frequency in the existing permit was based on an erroneous facility design flow. The draft permit contains weekly monitoring, which is more appropriate with monitoring requirements for facilities with design flow up to 0.1 mgd.

Table 4 Changes in Permit: Effluent Monitoring

Parameter	Existing Permit	Draft Permit
BOD_5	Monthly monitoring for the entire permit term as 8-hour composite sample type	2/month for the entire permit term as grab sample type
TSS	Monthly monitoring for the entire permit term as 8-hour composite sample type	2/month for the entire permit term as grab sample type
Temperature	None	1/week as a grab sample for the entire permit term
Total Residual Chlorine	5/Week as a grab sample for the entire permit term	1/week as a grab sample for the entire permit term
Total Ammonia as N	Monthly monitoring for one year of permit only as 8-hour composite sample type	2/month for entire permit term as a grab sample type
Total Phosphorus as P	None	Monthly monitoring for entire permit term as a grab sample type
Nitrate plus Nitrite	None	Monthly monitoring for entire permit term as a grab sample type
Total Kjeldahl Nitrogen	None	Monthly monitoring for entire permit term as a grab sample type
Dissolved Oxygen	None	Monthly monitoring for entire permit term as a grab sample type

C. Surface Water Monitoring

Table 5 presents the proposed surface water monitoring requirements for the draft permit. The locations are the same as in the existing permit. Surface water monitoring results must be submitted on an annual report. Surface water monitoring is only required during the month in which the facility discharges.

Table 5 Surface Water Monitoring Requirements[1]

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Upstream of WWTP outfall	Daily[2]	Recordings
pH	s.u.	Upstream of WWTP outfall	1/month	Grab
Temperature	°C	Upstream of WWTP outfall	1/month	Grab
Total Ammonia as N	mg/L	Upstream of WWTP outfall	1/month	Grab
Total Phosphorus as P	mg/L	Upstream of WWTP outfall	1/month	Grab
Nitrate plus Nitrite	mg/L	Upstream of WWTP outfall	1/month	Grab
Total Kjeldahl Nitrogen	mg/L	Upstream of WWTP outfall	1/month	Grab
Dissolved Oxygen	mg/L	Upstream of WWTP outfall	1/month	Grab
1. Monitoring must be conducted under flow conditions typical for the month when sampling occurs. Samples should not be collected immediately after storm events.				
2. Permittee shall provide an estimate or measurement of flow for each day when discharge occurs.				

D. Monitoring and Reporting

The draft permit includes new provisions to allow the permittee to 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. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR 122.41 and 403.12. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to EPA.

EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: http://www.epa.gov/netdmr.

VI. Sludge (Biosolids) Requirements

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

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

VII. Other Permit Conditions

A. Quality Assurance Plan

The City of Worley is required to update the Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping

samples, laboratory analysis, and data reporting. The plan shall be retained on site and be made available to EPA upon request.

B. Operation and Maintenance Plan

The permit requires the City of Worley 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 the facility within 180 of the effective date of the final permit. The plan shall be retained on site and made available to EPA upon request.

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

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

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 requirements for 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 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 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 EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describe 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(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 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. I/I Reduction Plan

The permit requires the permittee to develop an Inflow and Infiltration (I/I) Reduction Plan within three years of the effective date of the permit. The reason for this requirement is because the facility data show: 1) Average annual flow at the treatment plant exceeds 85% of the design criteria values. 2) Low influent pollutant concentrations 3) Occasional violations of BOD_5 and TSS percent removal requirements. The permittee has indicated these issues are due to ongoing high inflow and infiltration (I/I).

The plan must identify and prioritize measures to reduce I/I in the collection system.

E. Standard Permit Provisions

Sections III, IV and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because these requirements are based directly on NPDES regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that issuance of this permit will not affect any threatened or endangered species in the vicinity of the discharge.

B. Essential Fish Habitat

Essential fish habitat (EFH) includes 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 EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA has determined that issuance of this permit is not likely to adversely affect EFH in the vicinity of the discharge. EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to reissuance of this permit.

C. Permit Expiration

The permit will expire five years from the effective date.

IX. References

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

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

Appendix A: Wastewater Treatment Process Details

The City of Worley's sewage collection system receives raw sewage from homes and businesses in the community and conveys it via gravity to a central manhole, then through a trunk line under the railroad to the inlet manhole at the treatment site.

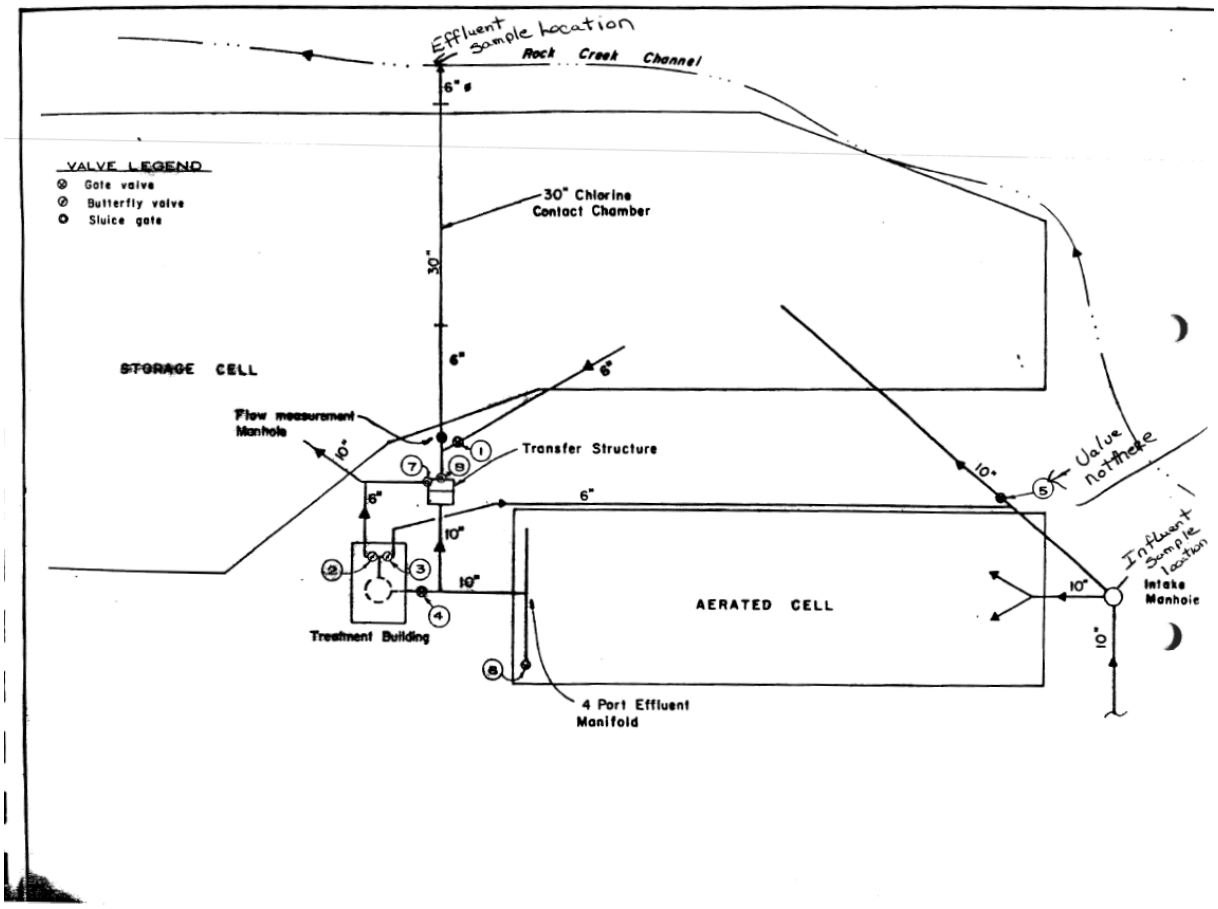
The Worley WWTP is designed to reduce the level of contaminants in the City's wastewater to a point where it can be discharged to North Fork Rock.

The treatment process involves an aerated lagoon (cell) treatment system, allowing for the growth and development of microorganisms that consume the organic material in the wastewater and break it down to water, carbon dioxide, and stable compounds that can then be discharged to North Fork Rock Creek with a lower impact on the aquatic environment.

Wastewater enters the first aerated cell of two lagoons with a volume of 8.10 acre feet and containing ten static tube aerators with the highest density in the south end. At the north end is a four port manifold that pumps water to a storage lagoon with a volume of 50.47 acre feet.

This aerated lagoon system, coupled with a chlorination process, is designed to provide full treatment of the City's domestic wastewater prior to discharge to North Fork Rock Creek. Due to variations in stream flow, discharge is not permitted year-round. Therefore, storage lagoons have been designed to accommodate the treated wastewater during the non-discharge seasons. These storage lagoons provide additional treatment to the wastewater and aid in re-circulation of the treated wastewater. They can also receive raw wastewater during emergency bypass situations.

Appendix B: Facility Map




Effluent Sample Location
North Fork Rock Creek
Influent Sample Location
B St, Worley, ID 83876, USA
© 2012 Google
Google earth
Imagery Date: 8/20/2011
1998
47°24'20.84" N 116°55'09.85" W elev 2631 ft
Eye alt 4338 ft

Appendix C: Basis for Effluent Limits

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

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which POTWs were required to meet by July 1, 1977. 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 WWTPs and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table C - 1 Secondary Treatment Effluent Limits (40 CFR 133.102).

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

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5	30 mg/L	45 mg/L	---
TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH*	---	---	6.0 - 9.0 s.u.
**See Water Quality-based Effluent Limits Section below*			

EPA has additionally established effluent limitations (40 CFR 133.105) that are considered "equivalent to secondary treatment," which apply to facilities meeting certain conditions established under 40 CFR 133.101(g). The permittee does not fit these requirements and so must meet secondary treatment standards.

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:

$$\textit{Mass based limit (lbs/day)} = \textit{concentration limit (mg/L)} \times \textit{design flow (mgd)} \times 8.34^{[1]}$$

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

Since the design flow for this facility is 0.0571 mgd, the technology-based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 0.0571 mgd × 8.34 = 14.3 lbs/day

Average Weekly Limit = 45 mg/L × 0.0571 mgd × 8.34 = 21.4 lbs/day

Use of Technology-based Effluent Limits in the Draft Permit

The concentration and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. As explained below, EPA has determined that more-stringent water quality-based effluent limits are necessary for pH, as well as *E. coli*, TRC, and ammonia, in order to ensure compliance with water quality standards.

B. Water Quality-based Effluent Limits

Water quality-based effluent limits were established for TRC, pH and ammonia using Coeur d'Alene Tribal WQS and the methods described below.

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the WQS of all affected States. The regulations also require that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable WQS.

The regulations require the permitting authority to conduct this "reasonable potential" analysis 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 WQS are met, and must be consistent with any available wasteload allocation (WLA).

Reasonable Potential Analysis

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

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

A mixing zone of 25% of the receiving water flow was used in calculating the water based effluent limits for TRC and ammonia.

Procedure for Deriving Water Quality-based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a WLA for the pollutant. A WLA is the concentration or loading of a pollutant that may be discharged to the receiving water without causing or contributing to an excursion above the WQS. WLAs are determined in one of the following ways:

1. TMDL-based WLA

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

2. Mixing zone-based WLA

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

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain monthly average, and weekly average or daily maximum permit limits. This approach takes into account effluent variability, sampling frequency, and WQS.

Proposed Water Quality-Based Effluent Limits

Table C - 2 summarizes the proposed WQBELs for this permit. EPA has carried over the reasonable potential determination for *E. coli* bacteria and TRC from the existing permit due to the nature of the discharge and because they were detected and limited under the existing permit.

Table C - 2 Proposed Water Quality-Based Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
pH	standard units (s.u.)	6.5-8.5		
E. Coli Bacteria[1]	CFU/100 ml	126	—	235 instantaneous max limit
TRC [2,3]	mg/L	0.019	—	0.038
	lbs/day	0.0090	—	0.018

Parameter	Units	Effluent Limits		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Ammonia	mg/L	12.8	—	33.5
	lbs/day	6.1	—	15.9

1. The permittee must report the geometric mean *E. coli* concentration.
2. The limits for TRC are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for TRC is 50 µg/L for this parameter. The EPA will use 0.050 mg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the TRC limitations if the average monthly and maximum daily concentration limits are less than 0.050 mg/L and the average monthly and maximum daily mass discharge limits are less than 0.024 lbs/day.

As discussed above (see Section III.A of this Fact Sheet) the EPA considered the Coeur d'Alene Tribal WQS, the State of Idaho WQS and the State of Washington WQS in determining the applicable designated uses and criteria for North Fork Rock Creek. The North Fork Rock Creek is an undesignated surface water. All Reservation TAS Waters not specifically classified are designated for aquatic life uses and for recreational and cultural uses. In addition, all Reservation TAS Waters are designated for the uses of industrial water supply, aesthetics, and wildlife habitat. According to the State of Idaho WQS, it is presumed that most water in the state will support cold water aquatic life and primary or secondary contact recreation beneficial.

Bacteria

The Coeur d'Alene Tribe's Reservation WQS state that "Waters designated for recreational and cultural use shall not contain concentrations of *E. coli* bacteria exceeding a 30-day geometric mean of 126 per colonies/100 ml, based on a minimum of 5 samples, and a single sample maximum of 235 colonies/100ml."

The geometric mean effluent limit is identical to the water quality standard. Consistent with the water quality standard, the permit requires a sampling frequency of five samples per month. The permit also includes a single sample maximum effluent limit for *E. coli* of 235 colonies/100 ml, which is identical to the single sample maximum water quality criterion for TAS waters.

pH

The pH criterion for protection of aquatic life is 6.5 to 8.5 s.u. This criterion is incorporated directly into the permit as an effluent limit.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The Worley WWTP uses chlorine disinfection. WLAs were calculated to determine the Long Term Averages (LTAs). Using the LTAs, the average monthly and maximum daily limits were calculated using the TSD (See Appendix E).

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

Average Monthly Limit= 0.0189 mg/L x 0.0571 mgd x 8.34 = 0.0090 lbs/day

Maximum Daily Limit = 0.0380 mg/L x 0.0571 mgd x 8.34 = 0.018 lbs/day

Additionally, EPA confirmed that the discharge has reasonable potential to cause or contribute to WQS violations for TRC because even when taking mixing into account, DMR data show that the facility regularly exceeds 0.011 mg/l, which is the criterion specified in WQS (see Appendix D).

Turbidity

For turbidity, the *Hangman Creek TMDL* requires Rock Creek to reduce Total Suspended Solids by 19%. The *Hangman Creek TMDL* acknowledges that wastewater treatment plants are not a big source of sediments. The TMDL gives a WLA of 30 mg/L (in Average Monthly Limit) to POTWs in Tekoa and Rockford in the State of Washington. The TSS average monthly limit in the existing and draft permit of 30 mg/L is consistent with the WLAs for the point sources in the *Hangman Creek TMDL*.

Temperature

Temperature in the *Hangman Creek TMDL* is based on natural conditions. The *Hangman Creek TMDL* provides a WLA to the Tekeo POTW in Washington of 18.2, 21.5, 17.7 degrees Centigrade (º C) for the 7 day daily maximum for June, July, and August. The Rockford POTW does not discharge in the summer during the period of high temperatures and therefore does not have a WLA in the *Hangman Creek TMDL*. The existing Worley permit authorizes discharge from the facility from November 1 through June 30th and requires a 10:1 dilution in the receiving water. This condition is retained in the draft permit. This condition has prevented any discharge during the critical time period for the Hangman watershed of June through August.

Ammonia

Ammonia criteria are based on a formula which relies on the pH and temperature of the receiving water, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase.

The Tribe's ammonia criteria are identical to that of Idaho and Washington. However, EPA disapproved the Tribe's ammonia criteria. The Tribe's adopted criteria were based on EPA's 1999 recommended criteria, which did not take into consideration ammonia toxicity to certain kinds of freshwater mussels and snails. EPA has since updated its national recommendation for ammonia in response to new mussel and snail sensitivity data, and published final revised criteria in the Federal Register on August 12, 2013. The Tribe anticipates adopting revised ammonia criteria to protect freshwater aquatic life based on EPA's latest recommendations.

For the draft permit assessed reasonable potential for ammonia based on the Tribe's existing criteria. The table below details the equations used to determine water quality criteria for ammonia. The City has collected monthly pH and temperature data the North Rock Creek upstream of the facility. These data were used to determine calculate ammonia criteria. As with any natural water body the pH and temperature of the water will vary over time. Therefore, to protect water quality criteria it is important to develop the criteria based on pH and temperature values that will be protective of aquatic life at all times. The EPA used the 95th percentile of the pH and temperature data for the calculations, which were calculated to be a pH of 7.5 and temperature of 14.3 ºC.

Table C - 3 Water Quality Criteria for Ammonia

	Acute Criterion[1]	Chronic Criterion
Equations:	$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$
Criteria	13.3 mg/L	4.4 mg/L

The discharge from the facility showed reasonable potential to exceed the water quality criteria for ammonia. Therefore, water quality based effluent limits in the permit were developed for ammonia. A review of the limited effluent data indicate that the facility should be able to meet the new ammonia limits.

Nutrients (Nitrogen and Phosphorus)

The Tribe has a narrative criterion for nutrients, which reads, "nutrients or other substances from anthropogenic causes shall not be present in concentrations which will This criterion has been included in the permit as a narrative effluent limit.

There were insufficient data to conduct a reasonable potential analysis for nutrients. Consistent with the requirements for the POTWs in the Hangman Creek watershed in Washington, the permit requires monitoring for nitrogen and phosphorus to evaluate nutrients contributions.

Narrative Requirements

The Coeur d'Alene WQS have general water quality criteria which apply to all TAS reservation waters. Therefore, EPA has included a narrative limitation prohibiting the discharge of visible oils, scum, foam, grease, and other floating materials and suspended substances of a persistent nature that may impair designated uses. The permittee must visually inspect the effluent for these conditions once per month.

C. Anti-backsliding Provisions

Section 402(o) of the CWA and 40 CFR 122.44 (l) 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 existing permit, unless certain exceptions are met.

All effluent limits in this permit are either identical to or more stringent than those in the existing permit; thus, antibacksliding does not apply.

D. Antidegradation

The proposed issuance of an NPDES permit triggers the need to ensure that the conditions in the permit ensure that Tier I, II, and III of the State's antidegradation policy are met. North Fork Rock Creek has not been assessed; however, because the permit does not authorize a new or increased discharge, the permit is consistent with Tier I and Tier II requirements.

E. Determining Final Limits

Table C - 4 below summarizes the numeric effluent limits that are in the proposed permit. The final limits are the more stringent of technology treatment requirements, water quality based limits, or limits retained as the result of anti-backsliding analysis or to meet anti-degradation.

Table C - 4 Proposed Effluent Limits

Parameter	Units	Effluent Limits			Basis
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	
BOD_5	mg/L	30	45	—	TBEL
	lbs/day	14.3	21.4		
	% removal	85% (min)	—	—	
TSS	mg/L	30	45		TBEL
	lbs/day	14.3	21.4		
	% removal	85% (min)	—	—	
pH	s.u.	6.5-8.5			WQBEL
E. Coli Bacteria	#/100 ml	126[3]	—	235 instantaneous max limit	WQBEL
TRC	mg/L	0.023	—	0.027	WQBEL
	lbs/day	0.011	—	0.013	
Ammonia	mg/L	12.8	—	33.5	WQBEL
	lbs/day	6.1	—	15.9	

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

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

A. Reasonable Potential Analysis

EPA uses the process described in the *TSD* to determine reasonable potential. To determine if there is a reasonable potential for pollutants of concern, 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.

EPA uses a steady state model to determine reasonable potential. Steady state models calculate WLAs at critical conditions that are usually a combination of reasonable worst-case assumptions of receiving water flow, effluent pollutant concentrations, and receiving water concentrations.

Mass Balance

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

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

where,

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

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

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

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

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

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

Where:

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

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

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

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

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

Discharge from the Worley WWTP is prohibited unless a 10:1 dilution is available. Reasonable potential and water quality based effluent limits were calculated assuming a 25% mixing zone. Therefore, the dilution factor becomes:

$$D = \frac{1 + 10 \times 0.25}{1} = 3.5$$

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

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

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 *TSD* recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

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

$p_n = (1 - \text{confidence level})^{1/n}$ Equation 7

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

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}}$$ Equation 8

Where,

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

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

$C_e = (RPM)(MRC)$ Equation 9

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

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

Reasonable Potential

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

Results of Reasonable Potential Calculations

Based on the calculations, it was determined that both TRC and ammonia have reasonable potential to cause or contribute to an exceedance of water quality criteria at the edge of the mixing zone. The results of the calculations are presented in the table at the end of this appendix. In addition, the reasonable potential determinations for *E. coli bacteria* and chlorine

are carried over from the previous permit due to the nature of the discharge and because they were detected and limited under the existing permit.

B. WQBEL Calculations

The following discussion presents the general equations used to calculate the water quality-based effluent limits. Water quality based effluent limits were developed for TRC and ammonia. The table at the end of this appendix presents the specific 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. The equation is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{Equation 10}$$

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 *TSD*:

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)} \qquad \text{Equation 11}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \qquad \text{Equation 12}$$

where,

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

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

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})} \qquad \text{Equation 13}$$

where,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

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

Derive the maximum daily and average monthly effluent limits

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

$$MDL = LTA \times e^{(z_m\sigma - 0.5\sigma^2)} \quad \text{Equation 14}$$

$$AML = LTA \times e^{(z_a\sigma_n - 0.5\sigma_n^2)} \quad \text{Equation 15}$$

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

σ_n^2 = $\ln(CV^2/n + 1$

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

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

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

The table below, details the calculations for water quality-based effluent limits.

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBE

Facility Name	Worley WWTP
Design Flow (MGD)	0.0571
Waterbody Type	Freshwater

Dilution Factors (IDAPA 58.01.02 03. b) — Annual

Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	**3.5**
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	**3.5**
Ammonia	**30B3/30Q10** (seasonal)	**3.5**
Human Health - Non-Carcinogen	**30Q5**	**11.0**
Human Health - carcinogen	**Harmonic Mean Flow**	**11.0**

Receiving Water Data

Notes: 5th % at critical flows

			Annual
Hardness, as mg/L $CaCO_3$	*** Enter Hardness on WQ Criteria tab ***		
Temperature, °C	**Temperature, °C**	95th percentile	14.3
pH, S.U.	**pH, S.U.**	95th percentile	7.5

Pollutants of Concern			**AMMONIA,** default: cold water, fish early life stages present	**CHLORINE (Total Residual)**
Effluent Data	**Number of Samples in Data Set (n)**		3	13
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	0.13
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		6,000	550
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only			
Dilution Factors	Aquatic Life - Acute	1Q10	3.500	3.500
	Aquatic Life - Chronic	7Q10 or 4B3	-	3.500
	Ammonia	30B3 or 30Q10	3.500	-
	Human Health - Non-Carcinogen	30Q5	-	11.000
	Human Health - carcinogen	Harmonic Mean	-	11.000
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**		600	0
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	13,283	19
	Aquatic Life Criteria, µg/L	Chronic	4,364	11
	Human Health Water and Organism, µg/L		--	--
	Human Health, Organism Only, µg/L		--	--
	Metals Criteria Translator, decimal (or default use	Acute	--	0.000
	Conversion Factor)	Chronic	--	0.000
	Carcinogen (Y/N), Human Health Criteria Only		--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.129
P_n	$=(1\text{-confidence level})^{1/n}$ w here confidence level =	**99%**	0.215	0.702
Multiplier (TSD p. 57)	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N\sigma-0.5\sigma^2]$, prob. =	**99%**	5.6	1.3
Statistically projected critical discharge concentration (C_d)			33734.65	694.06
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	10067.04	198.30
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	10067.04	198.30
Reasonable Potential to exceed Aquatic Life Criteria			**YES**	**YES**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			2	4
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			30	4
LTA Coeff. Var. (CV), decimal (Use CV of data set or default = 0.6)			0.600	0.600
Permit Limit Coeff. Var. (CV), decimal (Use CV from data set or default = 0.6)			0.600	0.130
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a\text{-}1)$	Acute	44,991.2	66.5
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c\text{-}1)$	Chronic	13,773.9	38.5
Long Term Ave (LTA), ug/L	$WLAc \times \exp(0.5\sigma^2\text{-}2.326\sigma)$	Acute	14,445.9	21.4
(99th % occurrence prob.)	$WLAa \times \exp(0.5\sigma^2\text{-}2.326\sigma)$; ammonia n=30	Chronic	10,747.8	20.3
Limiting LTA, ug/L	used as basis for limits calculation		10,747.8	20.3
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**12,786**	**23**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**33,480**	**27**
Average Monthly Limit (AML), mg/L			**12.8**	**0.023**
Maximum Daily Limit (MDL), mg/L			**33.5**	**0.027**
Average Monthly Limit (AML), lb/day			**6.1**	**0.011**
Maximum Daily Limit (MDL), lb/day			**15.9**	**0.013**

References: Idaho Water Quality Standards http://adminrules.idaho.gov/rules/current/58/0102.pdf
Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001