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Fact Sheet

Public Comment Start Date: July 22, 2009
Public Comment Expiration Date: August 21, 2009

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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 St. Anthony
Wastewater Treatment Plant

EPA Proposes To Reissue 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:
- 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 Clean Water Act Section 401 Certification
EPA is requesting that the Idaho Department of Environmental Quality (IDEQ) certify the NPDES 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
900 N. Skyline, Suite B
Idaho Falls, ID 83402
(208) 528-2650

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 Notice 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 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, 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.

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 permits, 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 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

US EPA Region 10
1435 N. Orchard
Boise, ID 83706
(208) 378-5746

Idaho Department of Environmental Quality
900 N. Skyline, Suite B
Idaho Falls, ID 83402
(208) 528-2650

St. Anthony Public Library
420 N. Bridge Street Suite E
St. Anthony, ID 83445
(208) 624-3192

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30Q10	30 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
AWL	Average Weekly Limit
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
ºC	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
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
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
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
USGS	United States Geological Survey
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 NPDES permit for the following entity:

City of St. Anthony
Wastewater Treatment Plant

Physical Location:
North ½, Section 11, Township 7N, Range 40E
¾ Mile SW of St. Anthony

Mailing Address:
420 N Bridge St. Suite A
St. Anthony, ID 83445

Contact: Woody Andersen, Public Works Superintendent

II. Facility Information

A. Treatment Plant Description

The City of St. Anthony owns, operates, and has maintenance responsibility for the wastewater treatment plant, which treats domestic sewage from local residents and commercial establishments. The plant is designed to provide secondary treatment to 0.80 mgd of wastewater. The average flow rate has been 0.43 mgd from April 2003 through March 2006.

The wastewater treatment plant uses a four-cell lagoon to provide secondary treatment. Preliminary treatment includes grit removal and fine screening. Treated wastewater is disinfected by chlorination.

B. Background Information

The most recent NPDES permit for the pollution control plant was issued on August 9, 2001, became effective on September 11, 2001 and expired on September 11, 2006. An NPDES application for permit reissuance was submitted by the city on May 24, 2006. EPA determined that the application was timely and complete, and the permit has been administratively extended under 40 CFR 122.6 until the permit can be reissued. The first NPDES permit was issued to this facility in August 1974.

A map has been included in Appendix A which shows the location of the treatment plant and the discharge location.

III. Receiving Water

This facility discharges to the Henry's Fork (sometimes called the North Fork) of the Snake River.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereinafter referred to as the TSD) (EPA, 1991) and Section 210 of the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria. Because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the 30B3 or the 30Q10 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Idaho water quality standards recommend the 30Q5 flow rate for non-carcinogens, and the harmonic mean flow rate for carcinogens.

The critical low flow rates of the Henry's Fork of the Snake River are shown in Table 1, below. Seasonal flow rates were used only for the reasonable potential and effluent limit calculations for ammonia, therefore only the 1Q10 and the 30Q10 are reported on a seasonal basis.

Table 1: Critical Low Flow Rates of the Henry's Fork of the Snake River in CFS

Season	1Q10	7Q10	30Q10 or 30B3	30Q5	Harmonic Mean
Year – Round	487	577	698	845	1440
June – October	472	N/A	684	N/A	N/A
November – May	742	N/A	985	N/A	N/A

B. Water Quality Standards

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States. A State's water quality standards 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 (such as drinking water supply, contact recreation, and aquatic life) that each water body is expected to achieve. The numeric and/or 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.

This facility discharges to the Henry's Fork River in the Lower Henry's subbasin (HUC 17040203). In this reach, the receiving water is designated for the uses of cold water aquatic life, salmonid spawning, primary contact recreation, and drinking water supply, and is also designated a special resource water (IDAPA 58.01.02.056, 58.01.02.150.05). Water quality criteria designed to protect these beneficial uses appear in Sections 210, 250, and 251 of the Idaho Water Quality Standards. Restrictions on point source discharges to special resource waters appear in Section 400.01.b of the Standards.

In addition, the Idaho Water Quality Standards state that all waters of the State of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c), wildlife habitats (100.04) and aesthetics (100.05). The WQS state, in Sections 252.02, 252.03, and 253 that these

uses are to be protected by narrative criteria which appear in Section 200. These narrative criteria state that all surface waters of the State shall be free from hazardous materials; toxic substances; deleterious materials; radioactive materials; floating, suspended or submerged matter; excess nutrients; oxygen-demanding materials; and sediment in concentrations which would impair beneficial uses. The WQS also state, in Section 252.02 that the criteria from *Water Quality Criteria 1972* (EPA-R3-73-033), also referred to as the "Blue Book," can be used to determine numeric criteria for the protection of the agricultural water supply use.

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 water quality standards 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 Appendices C, D, and E.

B. Proposed Effluent Limitations

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

1. The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses.
2. Removal Requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 35 percent of the monthly average influent concentration. Percent removal of BOD_5 and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, 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. Influent and effluent samples must be taken over approximately the same time period.
3. The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses of the receiving water.

Table 2 (below) presents the proposed numeric effluent limits.

Table 2: Proposed Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	45	65	—
	lb/day	300	434	—
	% removal	65% (min.)	—	—
Total Suspended Solids (TSS)	mg/L	45	65	—
	lb/day	300	434	—
	% removal	65% (min.)	—	—
E. Coli	#/100 ml	126[1]	—	406[2]
pH	s.u.	6.0 – 9.0 at all times		
Total Residual Chlorine	µg/L	500	750	—
	lb/day	3.34	5.0	—
Total Ammonia as N (June – October)	mg/L	26	—	53
	lb/day	173	—	354

Notes:
1. Geometric mean.
2. Instantaneous/single sample maximum.

C. Basis for Deleting Fecal Coliform Effluent Limits and for Less Stringent pH limits

The draft permit proposes to delete the previous permit's effluent limits for fecal coliform and to make the pH effluent limits less stringent than those in the previous permit. Effluent limitations for all other pollutants are as stringent as or more stringent than those in the current permit.

Statutory Prohibitions on Backsliding

Section 402(o) of the Clean Water Act (CWA) generally prohibits the establishment of effluent limits in a reissued NPDES permit that are less stringent than the corresponding limits in the previous permit, but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. water quality-based limits or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on technology-based effluent limits established using best professional judgment (i.e. based on Section 402(a)(1)(B)), but in this case, the effluent limits being revised are water quality-based effluent limits (WQBELs).

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). According to the *U.S. EPA NPDES Permit Writers' Manual* (EPA-833-B-96-003) the 402(o)(2) exceptions are applicable to WQBELs (except for 402(o)(2)(B)(ii) and 402(o)(2)(D)) and are independent of the requirements of 303(d)(4). Therefore, WQBELs may be relaxed as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied.

Even if the requirements of Sections 303(d)(4) or 402(o)(2) are satisfied, Section 402(o)(3) prohibits backsliding which would result in violations of water quality standards or effluent limit guidelines.

Fecal Coliform

The draft permit proposes to delete the fecal coliform limits in the previous permit, while retaining the E. coli limits from the previous permit. The Henry's Fork, at the point of discharge has not been listed on Idaho's "303(d) list" as not attaining or not being expected to attain water quality standards for bacteria. When water quality standards for the relevant pollutant are being attained, Section 303(d)(4)(B) of the Act states that water quality-based effluent limits may be revised if the revision is consistent with the State's antidegradation policy.

The draft permit, like the previous permit, includes "criteria end-of-pipe" effluent limits for bacteria, in order to protect contact recreation beneficial uses in the receiving water. The new water quality criteria and effluent limits simply use the indicator organism currently specified in the Idaho water quality standards (E. coli) to provide the same level of protection for the beneficial use of primary contact recreation as was provided by the fecal coliform effluent limits. EPA does not believe that the change from fecal coliform limits to E. coli limits will result in degradation of the receiving water or have any effect on beneficial uses. Therefore, EPA believes that the deletion of the of fecal coliform effluent limits is compliant with Section 303(d)(4)(B) of the Act.

pH

EPA has determined that a discharge in compliance with the technology-based lower pH limit of 6.0 standard units will result in a pH of 7.1 standard units at the edge of a mixing zone encompassing 10% of the 1Q10 flow rate of the receiving water (see Appendix F for calculations). A pH of 7.1 standard units is well within the range of Idaho's pH water quality criteria (6.5 to 9.0 standard units).

Because surface water monitoring data from the USGS and the permittee shows that the pH of the Henry's Fork tends to be relatively high (the minimum is 7.5 standard units, the average is 8.4 standard units, and the maximum is 9.3 standard units) and because the discharge represents only 0.25% of the receiving water's 1Q10 low flow rate, EPA believes a pH mixing zone for the lower pH limit is appropriate in this case, and the less-stringent pH limits resulting from this mixing zone will not result in lower water quality relative to the more-stringent pH limits in the previous permit. Therefore EPA believes that the less-stringent pH limits proposed in the draft permit are compliant with Section 303(d)(4)(B) of the Act.

Clean Water Act Section 402(o)(3) Requirements

Because the E. coli limits apply current water quality criteria at the end-of-pipe, the effluent limits are derived from and comply with water quality standards for E. coli. The secondary treatment technology-based effluent limits do not include effluent limits for bacteria. The proposed pH limits ensure compliance with water quality standards at the edge of a mixing zone encompassing 10% of the 1Q10 flow rate of the receiving water and are in compliance with the secondary treatment technology-based limits for pH. Because the effluent limits will continue to

ensure that water quality standards are met and do not violate the secondary treatment effluent limits, the limits proposed limits comply with Section 402(o)(3) of the CWA.

EPA is requesting that IDEQ certify that the deletion of the fecal coliform limits and the less-stringent pH limits are protective of Idaho's water quality standards under Section 401 of the CWA.

V. 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 part B.6 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 Discharge Monitoring Reports (DMRs) and on the application for renewal, as appropriate, to the U.S. Environmental Protection Agency (EPA).

B. Effluent Monitoring

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

Table 3, below, presents the proposed effluent monitoring requirements for the City of St. Anthony WWTP. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Monitoring Changes from the Previous Permit

Effluent BOD_5 and TSS concentrations have been greater than the average monthly limits of 45 mg/L about 25% of the time for BOD_5 and about 13% of the time for TSS. Therefore EPA has increased the monitoring frequency for BOD_5 and TSS in order to better determine compliance with the BOD_5 and TSS effluent limits. The sample type for parameters that are not likely to change with storage have been changed from grab to 8-hour composite. Depending on the timing of a grab sample, it may not be representative of the monitored discharge; composite sampling addresses this problem. The requirement for 8-hour composite sampling is consistent with the monitoring requirements for other Idaho sewage treatment plants with design flows between 0.5 and 1.0 mgd in permits issued by EPA Region 10 in the past five years.

EPA proposes quarterly effluent monitoring for the pollutants listed in Part B.6 of the Form 2A NPDES application that are not subject to effluent limits (total Kjeldahl nitrogen, nitrate plus

nitrite nitrogen, oil and grease, total phosphorus, dissolved oxygen, and total dissolved solids) so that these data will be available when the permittee applies for a renewal of this permit. EPA proposes quarterly monitoring for alkalinity to better determine the discharge's effect on the pH of the receiving water.

Table 3: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Influent & Effluent	Continuous	recording
BOD_5	mg/L	Influent & Effluent	2/month	8-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	2/month	8-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
pH	standard units	Effluent	1/week	grab
E. Coli	#/100 ml	Effluent	5/month	grab
Total Residual Chlorine	µg/L	Effluent	1/week	grab
	lb/day	Effluent		calculation[1]
Total Ammonia as N (June – October)	mg/L	Effluent	2/month	8-hour composite
	lb/day	Effluent		calculation[1]
Total Ammonia as N (November – May)	mg/L	Effuent	1/month	8-hour composite
Total Phosphorus	mg/L	Influent & Effluent	1/quarter	8-hour composite
Alkalinity	mg/L as $CaCO_3$	Effluent	1/quarter	8-hour composite
Dissolved Oxygen	mg/L	Effluent	1/quarter	grab
Nitrate + Nitrite	mg/L	Effluent	1/quarter	8-hour composite
Oil and Grease	mg/L	Effluent	1/quarter	grab
Temperature	ºC	Effluent	1/week	grab
Total Dissolved Solids	mg/L	Effluent	1/quarter	8-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	1/quarter	8-hour composite

Notes:
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 is calculated using the following equation: (average monthly influent – average monthly effluent) ÷ average monthly influent.

C. Surface Water Monitoring

Table 4 presents the proposed surface water monitoring requirements for the draft permit. Surface water monitoring results must be submitted with the application for renewal of the permit.

EPA proposes to discontinue flow monitoring in the receiving water, because the Henry's Fork of the Snake River is gauged by the USGS, at station number 13050500, which is near the point of discharge. EPA proposes to discontinue receiving water monitoring for temperature, pH, and ammonia, because the purpose of this monitoring was to determine if the discharge had the reasonable potential to cause or contribute to excursions above water quality standards for ammonia. An analysis of effluent and receiving water data shows that the discharge does, in fact, have the reasonable potential to cause or contribute to excursions above water quality standards for ammonia, therefore, further monitoring for pH, temperature, and ammonia in the receiving water will not yield meaningful data.

EPA proposes surface water monitoring for total phosphorus, total nitrogen, and dissolved oxygen, upstream and downstream from the point of discharge. These data will be used to determine if water quality-based effluent limits for nutrients or biochemical oxygen demand are necessary when the permit is reissued.

Table 4: Receiving Water Monitoring Requirements

Parameter (units)	Sample Locations	Sample Frequency	Sample Type
Dissolved Oxygen (mg/L)	Upstream and Downstream	Quarterly[1]	Composite
Total Nitrogen	Upstream and Downstream	Quarterly[1]	Composite
Total Phosphorus as P	Upstream and Downstream	Quarterly[1]	Composite

1. Quarters are defined as January through March, April through June, July through September and October though December.

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 purposes 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 federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The City of St. Anthony is required to update the Quality Assurance Plan for the wastewater treatment plant 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.

B. Operation and Maintenance Plan

The permit requires the City of St. Anthony 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 shall be retained on site and made available to EPA and IDEQ 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 water quality standards.

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, 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 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. 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 the issuance of this NPDES permit will have no effect on threatened or endangered species. Therefore, consultation is not required for this action. However, EPA will notify USFWS and NOAA Fisheries of the issuance of this draft permit and will consider any comments made by the Services prior to issuance of a final permit. See Appendix G of this fact sheet for more information.

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 EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. EPA has determined that the discharge from the City of St. Anthony WWTP will not affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action.

C. State Certification

Section 401 of the CWA requires 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.

D. 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.

Appendix A: Facility Information

General Information

NPDES ID Number:	ID0020401
Physical Location:	North ½, Section 11, Township 7N, Range 40E ¾ Mile SW of St. Anthony
Mailing Address:	420 N Bridge St. Suite A St. Anthony, ID 83445
Facility Background:	The most recent NPDES permit for the pollution control plant was issued on August 9, 2001, became effective on September 11, 2001 and expired on September 11, 2006. A complete application for permit reissuance was submitted by the city on May 24, 2006, and the permit has been administratively extended under 40 CFR 122.6. The first NPDES permit was issued to this facility in August 1974.

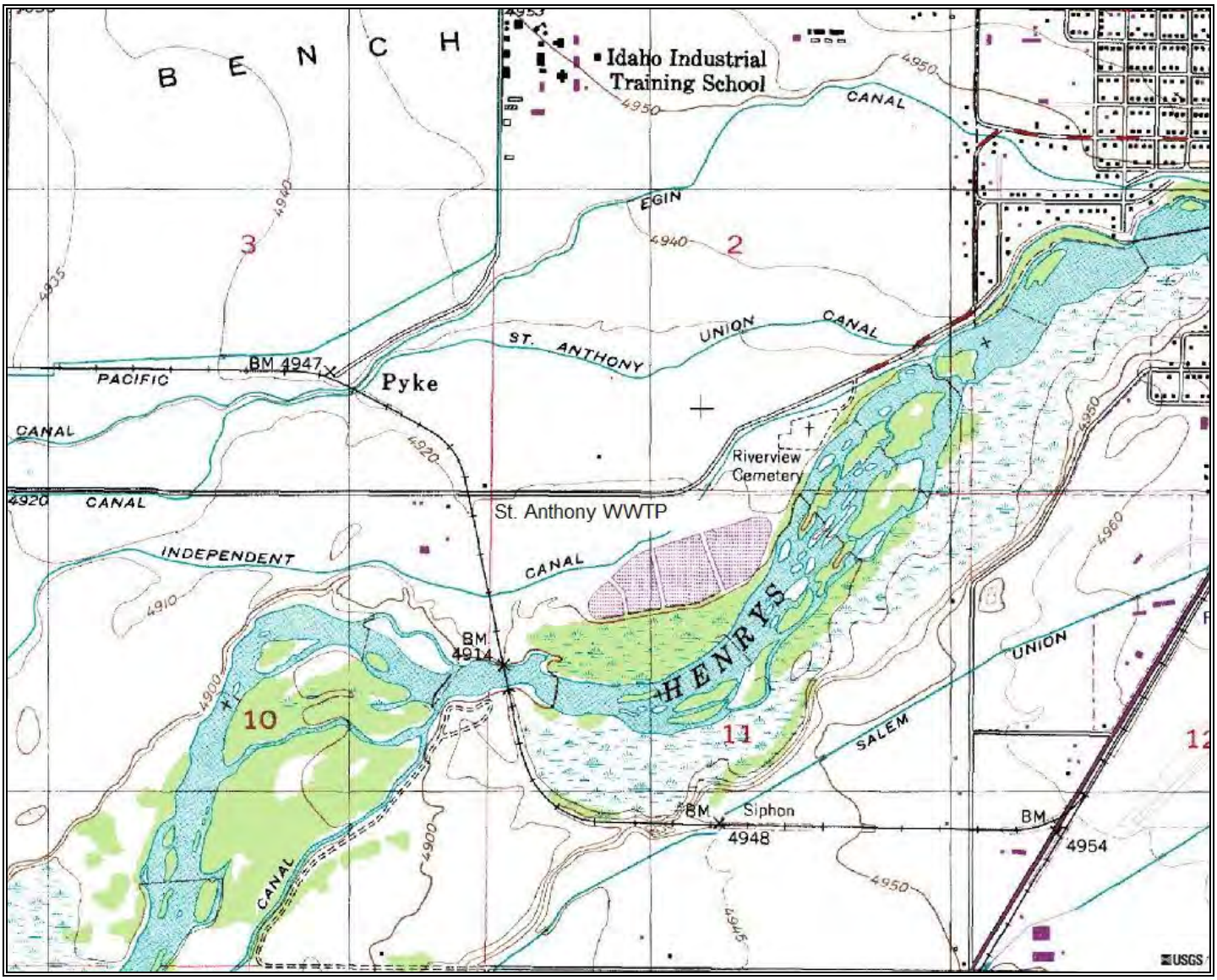
Facility Information

Type of Facility:	Publicly Owned Treatment Works (POTW)
Treatment Train:	Grit removal, fine screening, 4-cell aerated lagoon, chlorination
Flow:	Design flow is 0.8 mgd. Average flow from 4/2003 – 8/2006 was 0.43 mgd.
Outfall Location:	latitude 43º 57’ 6” N; longitude 111º 42’ 52” W

Receiving Water Information

Receiving Water:	Henry’s Fork of the Snake River
Watershed:	Lower Henry’s (HUC 17040203)
Beneficial Uses:	Cold water aquatic life, salmonid spawning, primary contact recreation, drinking water supply, special resource water, industrial and agricultural water supply, wildlife habitats, and aesthetics

Appendix B: Facility Map



Appendix C: Basis for Effluent Limits

The following discussion explains in more detail the statutory and regulatory basis for the technology and water quality-based effluent limits in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, and Part C discusses facility specific water quality-based effluent limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

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

For most POTWs, the applicable technology-based effluent limits are found in 40 CFR 133.102. However, some facilities are eligible for "treatment equivalent to secondary" effluent limits found in 40 CFR 133.105, which are less stringent than the "secondary treatment" limits of 40 CFR 133.102.

EPA has determined that the St. Anthony WWTP is eligible for treatment equivalent to secondary because it cannot consistently comply with the "secondary treatment" effluent limits of 40 CFR 133.102, it uses waste stabilization ponds as its principal treatment process, and it provides significant biological treatment of municipal wastewater, meaning it consistently removes at least 65% of influent BOD_5 (40 CFR 133.101(g), (k)).

The federally promulgated treatment equivalent to secondary effluent limits applicable to this facility are listed in Table C-1.

Table C-1: Treatment Equivalent to Secondary Effluent Limits
(40 CFR 133.105)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5	45 mg/L	65 mg/L	---
TSS	45 mg/L	65 mg/L	---
Removal Rates for BOD_5 and TSS	65% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

Alternative State Requirements and Special Considerations for Waste Stabilization Ponds

Alternative State Requirements are authorized by 40 CFR 133.105(d) and allow for less stringent limits than the "treatment equivalent to secondary" effluent limits for facilities eligible for "treatment equivalent to secondary" within a certain geographical area. The State of Idaho does

not have approved alternative state requirements (see the *U.S. EPA NPDES Permit Writers' Manual* at Page 84-85 and 49 FR 37005, September 20, 1984).

An alternate basis for establishing TSS effluent limits for POTWs using waste stabilization ponds that are less stringent than "treatment equivalent to secondary" limits is 40 CFR 133.103(c). This regulation allows EPA or the States (with EPA approval) to set TSS limits equal to the TSS effluent concentration achieved 90 percent of the time by waste stabilization ponds within a State or appropriate contiguous geographical area. This analysis has not been completed by EPA or the State of Idaho. Therefore, EPA cannot establish TSS limits less stringent than the "treatment equivalent to secondary" rule for the St. Anthony WWTP on the basis of 40 CFR 133.103(c).

Therefore, the proposed permit contains effluent limits consistent with the "treatment equivalent to secondary" rule (40 CFR 133.105(b)) which are more stringent than the TSS effluent limits in the previous permit.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The plant uses chlorine disinfection.

A 0.5 mg/L average monthly limit for chlorine 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 plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant 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. The AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for chlorine of 0.75 mg/L.

EPA has determined that the technology-based effluent limits for BOD_5, TSS, pH, and chlorine are stringent enough to ensure compliance with Idaho's federally-approved water quality standards.

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. 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:

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

Although the concentration limits for BOD_5 are identical to those in the previous permit, the mass limits for BOD_5 are more stringent than those in the previous permit. According to the fact sheet for the previous permit, EPA used a design flow of 1 mgd to calculate effluent limits (see 2001 Fact Sheet at Page 4). The most recent application, received on May 24, 2006 states that

[1] 8.34 is a conversion factor equal to the density of water in pounds per gallon

the design flow of the facility is 0.8 mgd. EPA has used the design flow from the most recent application to calculate the mass limits in the draft permit.

B. 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 by July 1, 1977. 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 water quality standards of all affected States. 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, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable water quality standards.

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.

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed, based on numeric criteria, 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 chemical, then the discharge has the reasonable potential to cause or contribute to an exceedance of the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it is 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 increase 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 when the receiving water meets the criteria necessary to protect the designated uses of the water body. Mixing zones must be authorized by IDEQ. Based on the previous permit, Idaho's draft *Mixing Zone Technical Procedures Manual*, and the draft certification, the water quality-based effluent limits in this permit have been calculated using a mixing zone. If IDEQ does not grant a mixing zone, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a wasteload allocation (WLA) for the pollutant. A wasteload allocation is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of water quality standards in the receiving water.

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

Once a WLA is developed, EPA calculates effluent limits which are protective of the WLA using statistical procedures described in Appendix E.

C. Facility-Specific Water Quality-based Limits

Ammonia

The Idaho water quality standards contain criteria for the protection of aquatic life from the toxic effects of ammonia. Because the Henry's Fork Snake River is designated for salmonid spawning, EPA has applied ammonia criteria which are protective of salmonids, including early life stages. The criteria are dependent on pH and temperature, 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 following table details the equations used to determine water quality criteria for ammonia, and the values of these equations at the 95th percentile pH (for the entire year), which is 9.15 standard units, and the 95th percentile temperature observed in the river upstream from the discharge, which is 20 ºC from June through October and 14 ºC from November through May.

Table C-2: Water Quality Criteria for Ammonia

	Acute Criterion[1]	**Chronic Criterion[2]**
Equations:	$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$
October - June	0.706	0.277
November - May		0.395
1. No seasonal variation was assumed for pH, therefore, there is no seasonal variation in the acute criterion (which is a function of pH only).		

E. Coli

The Idaho water quality standards state that waters of the State of Idaho that are designated for recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a thirty day period. Therefore, the draft permit contains a monthly geometric mean effluent limit for E. coli of 126 organisms per 100 ml, and a minimum sampling frequency of five grab samples per month (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 (see TSD at Section 5.3.1). Because a single sample value exceeding 406 organisms per 100 ml indicates a likely exceedance of the geometric mean criterion, 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. 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.

Floating, Suspended and Submerged Matter

The State of Idaho has a narrative water quality criterion which reads "Surface waters of the state shall be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses (IDAPA 58.01.02.200.05)." This criterion has been included in the permit as a narrative effluent limit.

D. Summary of Limits and Bases

The following table summarizes the general statutory and regulatory bases for the limits in the draft permit.

Table C-3 Summary of Effluent Limit Bases	
Limited Parameter	**Basis for Limit**
BOD_5	Clean Water Act (CWA) Section 301(b)(1)(B), 40 CFR 133 (technology-based)
TSS	CWA Section 301(b)(1)(B), 40 CFR 133 (technology-based)
Floating, Suspended or Submerged Matter	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.200.05 (water quality-based)
pH	CWA Section 301(b)(1)(B), 40 CFR 133 (technology-based)
E. Coli	CWA Sections 301(b)(1)(C) and 402(o), 40 CFR 122.44(d), IDAPA 58.01.02.251.01 (water quality-based and anti-backsliding)
Chlorine	CWA Section 402(a)(1)(B) (technology-based, best professional judgment)
Ammonia	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.060, IDAPA 58.01.02.250 (water quality-based, with mixing zone)

Appendix D: Reasonable Potential Calculations

The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Idaho's federally approved water quality standards. 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, 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. This section discusses how the maximum projected receiving water concentration is determined.

A. Mass Balance

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

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

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 (e.g. 1Q10 or 7Q10)

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

$$C_d = \frac{C_e Q_e + C_u Q_u}{Q_e + Q_u} \qquad \text{(Equation D-2)}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream, and 100% of the stream flow is available for mixing, under the State's mixing zone policies. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

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

Where MZ is the fraction of the receiving water flow available for dilution. The Idaho water quality standards generally limit mixing zones to 25% of the volume of the stream flow (IDAPA 58.01.02.060), and Idaho's draft *Mixing Zone Technical Procedures Manual* recommends that 10% of the critical flow be used, unless additional dilution is necessary (see the manual at

Sections 1.3 and 2.5.1). Consistent with the draft *Mixing Zone Technical Procedures Manual*, MZ is equal to 0.1 (10%) for all parameters, except ammonia and chlorine.

For ammonia and chlorine, the effluent limits resulting from a 10% mixing zone would not have been achievable by the existing wastewater treatment plant. In such cases, the draft *Mixing Zone Technical Procedures Manual* recommends adding additional stream flow volume in 5% increments (Section 2.5.1). EPA has determined that a mixing zone encompassing 20% of the critical low flow of the receiving water would result in achievable ammonia limits and a mixing zone encompassing 15% of the critical low flow of the receiving water would result in achievable chlorine limits. Since 15 – 20% is less than the maximum generally allowed under the water quality standards (25%), a 15% mixing zone is proposed for chlorine and a 20% mixing zone is proposed for ammonia, for both reasonable potential and effluent limit calculations.

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

$$C_d = C_e \qquad \text{(Equation D-4)}$$

Equation D-2 can be simplified by introducing a "dilution factor,"

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

There are multiple values for the dilution factor. Dilution factors are based on different critical low flow rates: The 1Q10 flow rate for acute aquatic life criteria, the 7Q10 for chronic aquatic life criteria (except for ammonia) and conventional pollutants, and the 30B3 or 30Q10 flow rate for the chronic ammonia criterion. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 1.24 CFS (0.8 mgd). The dilution factors are listed in Table D-1, below.

Table D-1: Dilution Factors

Season and Mixing Zone Size	Acute Dilution Factor	Chronic Dilution Factor	Chronic Ammonia Criterion Dilution Factor
Year – Round, 10% (except ammonia and chlorine)	40.3	47.6	N/A
Year – Round, 15% (chlorine)	60.0	70.9	N/A
June – October, 20% (ammonia)	77.3	N/A	112
November – May, 20% (ammonia)	121	N/A	160

After the dilution factor simplification, Equation D-2 becomes:

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

Equation D-6 is the form of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

B. Maximum Projected Effluent Concentration

For chlorine, EPA has used the technology-based average weekly limit of 750 µg/L as the maximum projected effluent concentration. For TSS, EPA has used the technology-based average weekly limit of 65 mg/L as the maximum projected effluent concentration. Water quality-based effluent limits are necessary only in cases where the technology-based effluent limit does not ensure compliance with water quality standards.

To calculate the maximum projected effluent concentration for ammonia, EPA has used the procedure described in section 3.3 of the TSD, "Determining the Need for Permit Limits with Effluent Monitoring Data." In this procedure, the 99th percentile of the effluent data is the maximum projected effluent concentration in the mass balance equation.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points.

The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6 (see TSD at Page 53).

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for copper as an example. Reasonable potential calculations for all pollutants can be found in Table D-2.

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

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

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

The data set contains 45 ammonia samples collected from the effluent, therefore:

$$p_n = (1 - 0.99)^{1/45}$$
$$p_n = 0.903$$

This means that we can say, with 99% confidence, that the maximum reported effluent copper concentration is greater than the 90th percentile.

The reasonable potential multiplier (RPM) is the ratio of the 99th percentile concentration (at the 99% confidence level) to the maximum reported effluent concentration. This is calculated as follows:

$$RPM = C_{99}/C_p \quad \text{(Equation D-8)}$$

Where,
$C = \exp(z\sigma - 0.5\sigma^2)$ (Equation D-9)

Where,
$\sigma^2 = \ln(CV^2 + 1)$ (Equation D-10)
$\sigma = \sqrt{\sigma^2}$
CV = coefficient of variation = (standard deviation) ÷ (mean)
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of ammonia:

CV = coefficient of variation = 0.626
$\sigma^2 = \ln(CV^2 + 1) = 0.331$
$\sigma = \sqrt{\sigma^2} = 0.575$
z = 2.326 for the 99th percentile = 1.297 for the 90th percentile

$C_{99} = \exp(2.326 \times 0.575 - 0.5 \times 0.331) = 3.635$
$C_{90} = \exp(1.297 \times 0.575 - 0.5 \times 0.331) = 1.909$

RPM = C_{99}/C_{90} = 3.23/1.79
RPM = 1.81

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

$C_e = (RPM)(MRC)$ (Equation D-11)

where MRC = Maximum Reported Concentration

In the case of ammonia,

$C_e = (1.81)(29.3 \text{ mg/L}) =$ **53.0 mg/L**

C. Maximum Projected Receiving Water Concentration

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. The maximum projected receiving water concentration is calculated from Equation D-6:

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

For ammonia, for June – October, the acute receiving water concentration is, in milligrams per liter:

$$C_d = \left[\frac{53 - 0.02}{77.3}\right] + 0.02 = 0.71$$

For ammonia, for June – October, the chronic receiving water concentration is, in milligrams per liter:

$$C_d = \left[\frac{53 - 0.02}{112}\right] + 0.02 = 0.49$$

The acute and chronic water quality criteria are 0.71 and 0.28 mg/L, respectively. Because the projected receiving water concentration is greater than the chronic criterion, a water quality-based effluent limit is necessary for ammonia, for June – October.

Table D-2, below, summarizes the reasonable potential calculations for chlorine, ammonia, and TSS. The permit application shows that nitrate plus nitrite nitrogen was not measured at quantifiable levels. EPA has required quarterly monitoring for nitrate plus nitrite nitrogen to determine if the discharge of nitrate and nitrite has the reasonable potential to cause or contribute to excursions above water quality standards.

Table D-2: Reasonable Potential Calculations

Parameter	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQ'D?**		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	
	ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*		*Pn*	*ug/L*	*CV*	*s*	*n*				COMMENTS
Ammonia, mg/L (June-Oct)	0.0200	0.71	0.28	0.71	0.49	**YES**	0.903	29.3	0.626	0.575	45	1.81	77.3	112	20% Mixing Zone
Ammonia, mg/L (Nov - May)	0.0200	0.71	0.39	0.46	0.35	**NO**	0.903	29.3	0.626	0.575	45	1.81	121	160	20% Mixing Zone
Chlorine (TBEL)		19	11	12	11	**NO**	N/A	750	N/A	N/A	N/A	1.00	60	71	15% Mixing Zone
TSS, mg/L (TBEL)	5.0000	25	25	6.5	6.3	**NO**	N/A	65	N/A	N/A	N/A	1.00	40	48	10% Mixing Zone

Appendix E: WQBEL Calculations - Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The new WQBELs for ammonia and chlorine are derived from aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits for the ammonia WQBEL for June - October. The calculations are summarized in Table E-1.

A. 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 (Equations D-6 and D-7). 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 D-6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{(Equation E-1)}$$

In the case of ammonia, for the acute criterion,

$$WLA_a = 77.3 \times (0.706 - 0.02) + 0.02$$
$$\mathbf{WLA_a = 53.0\ mg/L}$$

For the chronic criterion,

$$WLA_c = 112 \times (0.277 - 0.02) + 0.02$$
$$\mathbf{WLA_c = 28.7\ \mu g/l}$$

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 Chapter 5 of EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\,\sigma) \qquad \text{(Equation E-2)}$$
$$LTA_c = WLA_c \times \exp(0.5\,\sigma_4^2 - z\,\sigma_4) \qquad \text{(Equation E-3)}$$

where,

$$\sigma^2 = \ln(CV^2 + 1)$$
$$\sigma = \sqrt{\sigma^2}$$
$$\sigma_{30}^2 = \ln(CV^2/30 + 1)$$
$$\sigma_{30} = \sqrt{\sigma_{30}^2}$$
$$z = 2.326 \text{ for } 99^{th} \text{ percentile probability basis}$$

In the case of ammonia, for the season of June through October,

$$\sigma^2 = \ln(0.626^2 + 1) = 0.331$$
$$\sigma = \sqrt{\sigma^2} = 0.575$$
$$\sigma_{30}^2 = \ln(0.626^2/30 + 1) = 0.0130$$
$$\sigma_{30} = \sqrt{\sigma_{30}^2} = 0.114$$
$$z = 2.326 \text{ for } 99^{th} \text{ percentile probability basis}$$

Therefore,

$LTA_a = 53.0 \text{ mg/L} \times \exp(0.5 \times 0.331 - 2.326 \times 0.575)$
$LTA_a = 16.4$ mg/L

$LTA_c = 28.7 \text{ mg/L} \times \exp(0.5 \times 0.0130 - 2.326 \times 0.114)$
$LTA_c = 22.2$ mg/L

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below. For ammonia the acute LTA of 16.4 mg/L is more stringent.

B. Derive the maximum daily and average monthly effluent limits

Using the TSD equations (section 5.4.1), the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m \sigma - 0.5 \sigma^2)$ (Equation E-4)
$AML = LTA \times \exp(z_a \sigma_n - 0.5 \sigma_n^2)$ (Equation E-5)

where σ, and σ^2 are defined as they are for the LTA equations (E-2 and E-3) and,

$\sigma_n^2 = \ln(CV^2/n + 1)$
$\sigma = \sqrt{\sigma_n^2}$
$z_a = 1.645$ for 95^{th} percentile probability basis
$z_m = 2.326$ for 99^{th} percentile probability basis
n = number of sampling events required per month (minimum of 4)

In the case of ammonia,

$MDL = 16.4 \text{ mg/L} \times \exp(2.326 \times 0.575 - 0.5 \times 0.331)$
MDL = 53.0 mg/L

$AML = 16.4 \text{ mg/L} \times \exp(1.645 \times 0 .306 - 0.5 \times 0.0395)$
AML = 25.9 mg/L

Table E-1, on the following page, details the calculations for water quality-based effluent limits based on two-value aquatic life criteria.

Table E-1: Effluent Limit Calculations

Statistical variables for permit limit calculation													
LTA Probability Basis	99%												
MDL Probability Basis	99%												
AML Probability Basis	95%												
Permit Limit Calculation Summary									**Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations**				
	Acute Dil'n Factor	Chronic Dil'n Factor	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	Limiting LTA
PARAMETER			*ug/L*	*ug/L*	*ug/L*	ug/L	ug/L		*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
Ammonia, mg/L (June - October)	77.3	112	0.0200	0.706	0.277	**25.9**	**53.0**	20% Mixing Zone	53.0	28.7	16.4	22.2	16.4

Appendix F: Effluent Limit Calculations for pH

As shown in Table F-1, below, EPA has determined that a discharge at the technology-based lower pH limit of 6.0 standard units will ensure compliance with Idaho's water quality criteria for pH (a range of 6.5 to 9.0 standard units, IDAPA 58.01.02.250.01.a) at the edge of a mixing zone encompassing 10% of the 1Q10 flow rate of the receiving water. EPA did not perform a water quality-based calculation for the upper pH limit because the technology-based upper pH limit is identical to the upper limit of the water quality criteria (9.0 standard units).

Table F-1: Effluent Limit Calculations for pH

INPUT	
1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	40.3
2. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	8.67
pH:	7.55
Alkalinity (mg CaCO3/L):	54
3. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	20
pH:	6.00
Alkalinity (mg CaCO3/L):	150
OUTPUT	
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.48
Effluent pKa:	6.38
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.92
Effluent Ionization Fraction:	0.29
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	58.57
Effluent Total Inorganic Carbon (mg CaCO3/L):	511.49
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	8.95
Alkalinity (mg CaCO3/L):	56.38
Total Inorganic Carbon (mg CaCO3/L):	69.80
pKa:	6.47
pH at Mixing Zone Boundary:	**7.10**

Appendix G: Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the US Fish and Wildlife Service (USFWS) regarding potential effects that a federal action may have on listed endangered and threatened species.

In an e-mail dated January 21, 2009, NOAA Fisheries stated that there are no threatened or endangered species under NOAA's jurisdiction in the Snake River drainage upstream of the Hells Canyon Dam, which is located at river mile 247.5. The City of St. Anthony discharge is more than 600 miles upstream from the nearest ESA-listed threatened or endangered species under NOAA's jurisdiction. Therefore, the reissuance of this permit will have no effect on any listed threatened or endangered species under NOAA's jurisdiction.

The subject discharge is located in Fremont County, Idaho. The USFWS county species list for Fremont County lists the following threatened and endangered species:

- Canada lynx (*Lynx canadensis*) Listed Threatened
- Ute ladies'-tresses (*Spiranthes diluvialis*) Listed Threatened
- Utah valvata snail (*Valvata utahensis*) Listed Endangered

Discharges of pollutants to surface waters have the potential to directly affect aquatic species. The only aquatic species on the list is the Utah valvata snail. According to the *Snake River Aquatic Species Recovery Plan* (USFWS 1995a), both the current and historic distributions of the Utah valvata snail are downstream from the American Falls dam, which is located at river mile 714 on the Snake River, about 148 river miles downstream from the subject discharge. Because the draft permit includes water quality-based limits for all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to excursions above water quality standards (40 CFR 122.44(d)(1)(i, iii)), as well as technology-based effluent limits which have been shown to be protective of water quality, and these limits ensure a level of water quality that is derived from and complies with water quality standards (40 CFR 122.44(d)(1)(vii)(A)) either at the end-of-pipe or at the edge of a mixing zone encompassing no more than 20% of the critical low flow of the receiving stream, the discharge will not affect water quality downstream of the American Falls dam. Therefore, the reissuance of the City of St. Anthony NPDES permit will have no effect on the Utah valvata snail.

EPA has also determined that the reissuance of an NPDES permit to the City of St. Anthony will have no effect on the Canada lynx or Ute ladies' tresses. These species are terrestrial species, which are generally not susceptible to the water quality impacts that may result from the reissuance of an NPDES permit.

The primary causes of the Canada lynx's decline are habitat destruction, overutilization for commercial, recreational, scientific, or educational purposes, and climate change (USFWS 2005). The primary causes of the Ute ladies' tresses decline include modification of riparian and wetland habitats associated with livestock grazing, vegetation removal, excavation, construction, stream channelization, exotic species invasion, and actions that alter hydrology (USFWS 1995b).

Reissuance of an NPDES permit to the City of St. Anthony will have no effect on habitat destruction, utilization of species for commercial, recreational, scientific, or educational purposes, climate change, vegetation removal, excavation, construction, stream channelization,

exotic species invasion, or hydrologic alteration. Therefore, the issuance of this permit will have no effect on the Canada lynx or the Ute ladies' tresses.

References

US Fish and Wildlife Service. 1995. Snake River Aquatic Species Recovery Plan. Snake River Basin Office, Ecological Services, Boise, Idaho. 92 pp.

US Fish and Wildlife Service. 1995. Ute ladies' tresses (Spiranthes diluvialis) recovery plan. US Fish and Wildlife Service, Denver, Colorado. 46 pp.

US Fish and Wildlife Service. 2005. Recovery Outline for the Contiguous United States Distinct Population Segment of the Canada Lynx.