FACT SHEET

The United States Environmental Protection Agency (EPA)
Proposes To Reissue
A National Pollutant Discharge Elimination System (NPDES) Permit to:

The City of Blackfoot
157 N. Broadway
Blackfoot, Idaho

NPDES Permit Number: ID-002004-4

Public Notice Start Date: May 25, 2012
Public Notice Expiration Date: June 25, 2012

Technical Contact: John Drabek, 206-553-8257, drabek.john@epa.gov
1-800-424-4372 ext. 3-8257 (within Region 10)
drabek.john@epa.gov

The EPA Proposes To Reissue NPDES Permit

The EPA proposes to reissue the NPDES permit to 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 place limits on the types and amounts of pollutants that can be discharged from each facility.

This Fact Sheet includes:

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

State Certification for Facilities that Discharge to State Waters

The EPA will request 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
Pocatello Regional Office
444 Hospital Way, No. 300
Pocatello, Idaho 83201
ph: (208) 236-6160
fx: (208) 236-6168
toll-free: (888) 655-6160

Public Comment

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

After the Public Notice expires and all comments have been considered, the EPA Region 10's Director for the Office of Water and Watersheds will make a final decision regarding permit reissuance. 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 comments are received, the EPA will address the comments and issue the permit. In such a case, the permit will become effective at least 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 permit and fact sheet are posted on the Region 10 website at http://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID Copies may also be requested by writing to the EPA at the Seattle address below, by e-mailing washington.audrey@epa.gov, or by calling Audrey Washington at 206-553-0523 or (800) 424-4372 ext 0523 (within Alaska, Idaho, Oregon, & Washington). Copies may also be inspected and copied at the offices below between 8:30 a.m. and 4:00 P.M., Monday through Friday, except federal holidays. In Seattle, visitors report to the 12th floor Public Information Center.

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)

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(208) 378-5746

IDEQ
Pocatello Regional Office
444 Hospital Way #300
Pocatello, ID 83201
ph: (208) 236-6160
fx: (208) 236-6168
toll-free: (888) 655-6160

For technical questions regarding the permit or fact sheet, contact John Drabek at the phone number or e-mail address at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384 and ask to be connected to the appropriate phone number. Persons with disabilities may request additional services by contacting John Drabek.

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I. APPLICANT

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

Facility Name: City of Blackfoot Wastewater Treatment Plant

Mailing Address: 2025 Riverton Road, Blackfoot, Idaho 83221

Facility Address: 2025 Riverton Road, Blackfoot, Idaho 83221

Contact: Rex T. Moffat, Plant Superintendent (208) 785 - 8616

II. FACILITY INFORMATION

A. Facility Description

The City of Blackfoot owns, operates and has maintenance responsibility for a facility that treats domestic sewage that is primarily from local residents and commercial establishments through a separated sanitary sewer system. Blackfoot also treats sewage from the Groveland Sewer District and the Moreland Sewer District. Blackfoot has an approved pretreatment program that limits industrial users prior to discharge to the collection system. The significant industrial users (greater than 0.25 million gallons per day, mgd) to the system are the following:

Discharger	Business category	Discharge rate, mgd; type
Blackfoot Cheese	Cheese processing	0.15; process wastewater
Basic American Foods, Blackfoot Division	Potato processing	0.045; non-process wastewater
Nonpareil IPP	Potato packing	0.05; process wastewater
American Linen Supply Company	Uniform and linen rental, laundry	0.035, process wastewater

Primary treatment consists of screening. Secondary treatment is biological using the activated sludge process in aeration basins. Disinfection is by ultraviolet radiation.

Digested solids are treated by a dissolved air floatation tank and three aerobic digesters. Solids and filtrate are separated with the filtrate returning to the headworks and the pressed solids are hauled to a landfill for final disposal.

The facility serves a population of 12,700 and has a design flow rate of 3.2 mgd.

The estimated average inflow and infiltration is about 300,000 gallons per day. Infiltration occurs when irrigation water is on during mid-April to mid-October. To address inflow and infiltration Blackfoot repairs piping in the areas that are affected.

Permit History

The facility's previous permit became effective on November 28, 2000 and expired on November 28, 2005. A complete application for permit reissuance was submitted to the EPA on May 1, 2005. Since the permit was not reissued before the expiration date of November 28, 2005 and since Blackfoot submitted a timely application, the permit was administratively extended pursuant to 40 CFR 122.6.

B. Compliance History

A review of the DMRs from October 2007 to September 2010 found the following violations of effluent limits:

Total Suspended Solids

A violation of the monthly average limit of 30 mg/L, at 55.6 in June 2008.

Violations of the weekly average limit of 45 mg/L, at 78.7 in February 2008 and 100.5 in June 2008.

A violation of the weekly average loading limit of 1126 lb/day, at 1238.5 in June 2008.

Total Suspended solids, percent removal

Violations of the monthly limit of 85% minimum removal, at 74.53% in February 2008 and 63.2% in June 2008.

E. coli

A violation of the monthly geometric mean limit of 126 colonies/100 ml, at 805 in June 2008.

A violation of the daily maximum of 400 colonies/100 ml, at 1600 in June 2008.

III. RECEIVING WATER

The treated effluent from Blackfoot's wastewater treatment facility is discharged continuously to the Snake River at river mile 776.81, which lies within the American Falls Subbasin, Snake River - Mile 791 to American Falls Reservoir. Beneficial uses for this segment of the Snake River are cold water communities, salmonid spawning, primary contact recreation, and domestic, agricultural and industrial water supply. The outfall is located at latitude 43° 10' 56" N and longitude 112° 23' 14" W.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and 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 Idaho 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, the EPA has used the 30B3 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 1Q10, 7Q10, 30B3, 30Q5, and harmonic mean flow rates of Snake River are 1,190 cfs, 1,400 cfs, 1,750 cfs, 1,870 cfs and 4,110 cfs, respectively. These calculations used data from the USGS station 13060000, Snake River near Shelley, Idaho, which is located at river mile 787.8 upstream from Blackfoot. The period of record for these calculations was 1971 to 2010.

Corresponding seasonal values for flow data from the same USGS station 13060000 are 1590 cfs, 1810 cfs, 1800 cfs, 2790 cfs, and 3900 cfs, respectively, for the climate season April 1-September 30; and 1170 cfs, 1420 cfs, 1790 cfs, 1860 cfs, and 3900 cfs, respectively, for the climate season October 1-March 31. The period for these calculations was 1979 to 2011, which is subsequent to construction of the Palisades Dam on the Snake River above Blackfoot in the 1950's.

B. Water Quality Standards

Section 301(b)(1)(C) of the Clean Water Act (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.

Idaho Water Quality Standards (WQS) summarize the surface water use designations for the State of Idaho: that all waters of the State of Idaho are protected for the uses of industrial and agricultural water supply (IDAPA 58.01.02.100.03.b and c), wildlife habitats (IDAPA 58.01.02.100.04) and aesthetics (IDAPA 58.01.02.100.05). The American Falls Subbasin, Snake River - Mile 791 to American Falls Reservoir is protected for cold water and salmonid spawning. Cold water is water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species. This segment of the Snake River is also designated for domestic water supply and primary contact recreation for water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to, those used for swimming, water skiing or skin diving.

Antidegradation

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES

permits that ensure compliance with State water quality standards, including antidegradation requirements. IDEQ has provided the EPA with an antidegradation analysis that complies with the State's antidegradation implementation procedures in the State's 401 certification.

C. Water Quality Limited Segment

A water quality limited segment (WQLS) is any waterbody where it is known that water quality does not meet applicable water quality standards or is not expected to meet applicable water quality standards. In accordance with section 303(d) of the Clean Water Act, States must identify waters not achieving water quality standards in spite of application of technology-based controls in National Pollutant Discharge Elimination System (NPDES) permits for point sources. Such waterbodies are known as water quality limited segments (WQLSs), and the list of such waterbodies is called the "303(d) list."

The American Falls Reservoir was identified on the State of Idaho's 303(d) list because it did not attain the state water quality standards for sediment, phosphorus, and dissolved oxygen. The Snake River in the area of Blackfoot's discharge is also listed on Idaho's 303(d) list because it did not attain the state water quality standards for dissolved oxygen, nutrients and sediment. The IDEQ has prepared the draft *American Falls Subbasin Total Maximum Daily Load (TMDL) Plan: Subbasin Assessment and Loading Analysis October 2011 (Draft TMDL)*. The Draft TMDL has been submitted to EPA for approval however the EPA has not yet approved it. Although the wastewater treatment plant contributes sediments to the Snake River, the facility appears to have little measurable effect on water quality.

The current WWTP has average effluent concentrations of TSS 11 mg/L, well below the Snake River target concentration of 60 mg/L and has a NPDES average monthly concentration limit of 30 mg/L. To insure no degradation of water quality, the proposed permit limits the TSS discharge to the existing annual TSS load of 72.5 tons per year. This load is based on the current average flow of 2.45 cfs and the average monthly effluent concentration limit of 30 mg/L. This limit is consistent with the wasteload allocation in the Draft TMDL. Monthly and weekly effluent limits TSS will be established as required by the 40 CFR §122.45(d)(2) to implement the waste load allocation.

As a tributary to the American Falls Reservoir, phosphorus loads from the Snake River contribute to nutrient levels in the reservoir. However, contributions from the Blackfoot WWTP do not appear to affect the Snake River water quality to any significant degree. Effluent flows from the Blackfoot WWTP from January 2000 to September 2003 averaged less than 2.45 cfs. In contrast, flows in the Snake River near Blackfoot averaged 4,840 cfs (Water Years 1910-2002; Brennan et al. 2003). Comparing the current loads from the facility and target phosphorus loads in the Snake River, Blackfoot contributes less than 3 percent of the phosphorus load in the Snake River on an annual basis, indicating the point source does not impact the Snake River water quality to any significant degree.

The target phosphorus concentration for the Snake River in the American Falls subasin is 0.05 mg/L. Currently, the river is below that concentration. Nonetheless, effects on the reservoir by any potential significant increase in nutrient loading to the Snake River should be considered prior to approval of such discharge. Therefore, total phosphorus load for the Blackfoot WWTP will be limited to the existing discharge rate of 7.10 tons of total phosphorus annually. The draft TMDL concluded that the nutrients from the Blackfoot

WWTP do not appear to be affecting beneficial uses in the Snake River, therefore the wasteload allocation reflects no overall increase from current loading. Since it is likely the area will see future population growth, maintain the current load allows for growth but, requires treatment beyond current levels to achieve this. Monthly and weekly effluent limits for total phosphorus are established as required by the 40 CFR §122.45(d)(2) to implement the waste load allocation (See Appendix B).

The critical period for nutrients affecting beneficial uses generally is the warmer months of summer and early fall. Nutrients promote growth of aquatic vegetation, which usually is at highest density in late summer - a time of high recreational use. When vegetative matter such as algae dies, it sinks to the bottom where microbial action uses oxygen to breakdown organic matter. Warmer water temperatures occur in summer, and because saturation levels of gases decline as temperature increases, decreased concentrations of dissolved oxygen result. These conditions stress aquatic biota when oxygen levels are low, and respiration of dense aquatic vegetation pushes dissolved oxygen concentrations lower. The tendency for the uptake of phosphorus as phosphates by sediment creates the potential for phosphorus availability throughout the growing season regardless of time of input. Phosphorus in sediment is directly available for uptake by rooted aquatic vegetation, and becomes available to algae or surface vegetative growth when phosphorus adsorbed to sediment is released into the water column under anoxic (no oxygen) conditions. Thus, phosphorus that entered a stream in February could be bioavailable to aquatic vegetation in a reservoir in July when conditions are conducive to algal or macrophytic growth.

Due to concern about American Falls Reservoir, which is on the 303(d) list for nutrients, no allowance for seasonal variation in nutrient loading is made.

Dissolved Oxygen

Few options are available to increase dissolved oxygen levels other than by controlling aquatic vegetative growth by limiting nutrient input. Therefore, the approach taken in the permit is to prevent decreases in dissolved oxygen levels in the American Falls Reservoir by ensuring no increase in total phosphorus loading from Blackfoot.

IV. EFFLUENT LIMITATIONS

A. Basis for Permit Effluent Limits

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent 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 of a waterbody are being met and they may be more stringent than technology-based effluent limits. The basis for the proposed effluent limits in the draft permit are provided in Appendix B of this document.

Effluent limits and monitoring for the existing permit are provided in Table 1.

Table 1: Effluent Limitations and Monitoring Requirements from the Previous Permit - Outfall 1						
Parameter	**Units**	**Monthly Avg.**	**Weekly Max**	**Instantaneous Maximum Limit**	**Sample Frequency**	**Sample Type**
Flow	MGD	---	---	---	Continuous	Recording
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	---	2/week	24-Hour Composite
	lbs/day	1,276	1,914	---		
Total Suspended Solids (TSS)	mg/l	30	45	---	2/week	24-Hour Composite
	lbs/day	1,276	1,914	---		
Temperature	°C	---	---	---	monthly	Grab
Fecal Coliform	colonies/100 ml	200	---	---	5 days/week	Grab
E. coli Bacteria	colonies/100 ml	126	---	406	2 days/week	Grab
pH	s.u.	6.0 – 9.0			5 days/week	Grab
Total Ammonia as N						
April 1-September 30	mg/L	8.25	---	23.1	1/month	24-hour composite
	lbs/day	350.9	---	982.5	1/month	24-hour composite
October 1-March 31	mg/L	13.8	---	38.7	1/month	24-hour composite
	lbs/day	587.0	---	1646		
Hardness, as CaCO3	mg/L	---			Whenever metals are sampled	24-hour composite
Alkalinity, as CaCO3	mg/L	---			Effluent whenever metals are sampled	24-hour composite
Dissolved Oxygen	mg/L	---			2 days/week	Grab
Total Residual Chlorine	mg/L	---			1/day	Grab
Lead	µg/L	---			2/year	Grab
Total Phosphorus	mg/L	---			1/month	24-hour composite
Turbidity	NTU	---			1/month	24-hour composite
Nitrate-Nitrite	mg/L	---			1/month	24-hour composite
Total Kjeldahl Nitrogen	mg/L	---			1/month	24-hour composite
Ortho-Phosphorus	mg/L	---			1/month	24-hour composite
Whole effluent toxicity	TUc	---			1/quarter for year	24-hour composite

B. Proposed Effluent Limitations

The following summarizes the proposed effluent limitations that are in the draft permit:

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

Table 2 below presents the proposed effluent limits for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), *Escherichia coli (E. coli)*, pH, total phosphorus, total ammonia, and the minimum percent removal requirements for BOD_5 and TSS.

Table 2
Effluent Limitations

Parameters	Average Monthly Limit	Average Weekly Limit	Minimum Percent Removal[1]	Daily Maximum Limit
BOD_5	30 mg/L	45 mg/L	85%	--
	801 lbs/day[2]	1,200 lbs/day[2]		--
TSS	30 mg/L	45 mg/L	85%	--
	650 lbs/day[2]	1,490 lbs/day[2]		--
E. coli Bacteria	126 colonies /100mL[3]	--	--	406 colonies /100mL[4]
Total Phosphorus[2]	72.3 lb/day	108 lb/day	--	
Total Ammonia as N: April 1-September 30	8.25 mg/L	--	--	23.1 mg/L
	350 lb/day	--	--	983 lb/day
Total Ammonia as N: October 1-March 31	13.8 mg/L	--	--	38.7 mg/L
	587 lb/day	--	--	1,650 lb/day
pH	6.5 – 9.0 standard units			

1. Percent removal is calculated using the following equation: ((influent - effluent) / influent) x 100, this limit applies to the average monthly values.
2. Loading is calculated by multiplying the concentration in mg/L by the design flow of 5.1 mgd and a conversion factor of 8.34 lbs/gallon.
3. The monthly average for *E. coli* is the geometric mean of all samples taken during the month.
4. Instantaneous maximum limit

V. MONITORING REQUIREMENTS

A. Basis for Effluent and Surface Water Monitoring Requirements

Section 308 of the CWA and federal regulation 40 CFR §122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring is also required to characterize the effluent to determine if additional effluent limitations are required and to monitor effluent impacts on receiving water quality.

B. Effluent Monitoring Requirements

1. Parameters

BOD_5, TSS, *E. coli*, Total Phosphorus, Flow, pH and Ammonia

The permit requires monitoring BOD_5, TSS, *E. coli*, total phosphorus, flow, ammonia and pH to determine compliance with the effluent limits; it also requires monitoring of the influent for BOD_5 and TSS to calculate monthly removal rates.

Mercury

An August 23, 2007 memorandum from James A. Hanlon (Director of EPA Office of Wastewater Management) to the EPA Water Division Directors clarifies and explains that, in light of existing regulatory requirements for NPDES permits, only the most sensitive methods, such as Methods 1631E and 245.7, are appropriate in most instances for use in deciding whether to set a permit limitation for mercury and for sampling and analysis of mercury pursuant to the monitoring requirements within a permit. See *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*, which is available at http://www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf.

The permit requires Methods 1631E or 245.7 for mercury monitoring.

Metals and Cyanide

Monitoring is required for metals and cyanide, found in detectable amounts among Expanded Effluent Testing Data reported in the permittee's application for renewal. The draft permit requires effluent and surface water monitoring for these parameters for the term of the permit. The data will allow a reasonable potential analysis to be conducted for the next permit cycle.

Ammonia

Ammonia monitoring is increased from once per month to once per week to determine compliance with the weekly effluent limits.

Total Phosphorus

Phosphorus monitoring is increased from once per month to once per week to determine compliance with the weekly effluent limits.

Expanded Part D Monitoring

The City of Blackfoot WWTP is a major municipal NPDES facility (i.e., ≥1 MGD design flow) and is subject to expanded effluent and whole effluent toxicity (WET) testing at its next application submittal. As indicated, in Part D of NPDES application Form 2A, expanded effluent testing is required of all municipal WWTPs with design flow equal to or greater than 1 MGD. Expanded effluent testing includes a full priority pollutant scan (40 CFR §131.36) along with some additional parameters. Since the permit application requires reporting the results from a minimum of three expanded effluent testing events with the application submittal, the permit requires this monitoring in the second, third, and fourth years of the permit to avoid having three sampling events performed during a short time frame just prior to application submittal. Results from the expanded effluent testing must be submitted to the EPA with the DMRs and WET test results.

Kjeldahl Nitrogen

The existing permit requires monitoring for total Kjeldahl nitrogen**.** IDEQ and the EPA agree Kjeldahl nitrogen monitoring is not required since total phosphorus is the primary limiting nutrient in the Snake River. Monitoring will be discontinued.

Ortho-Phosphorus

The existing permit requires monitoring for ortho-phosphorus. IDEQ and the EPA agree since total phosphorus is the primary limiting nutrient ortho-phosphorus monitoring will be discontinued.

Nitrate-Nitrite

IDEQ and the EPA agree since total phosphorus is the primary limiting nutrient nitrate-nitrite monitoring will be discontinued.

Hardness

IDEQ and the EPA agree hardness in the receiving water is used to calculate the water quality standards for metals. Monitoring for hardness in the effluent is discontinued.

Total Residual Chlorine

Monitoring for total residual chlorine is discontinued because Blackfoot switched from chlorine disinfection to ultraviolet disinfection.

2. Frequency

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 the EPA approved test methods (generally found in 40 CFR §136) and if the Minimum Levels (MLs) are less than the effluent limits.

Table 3 presents the effluent monitoring requirements for the permittee in the draft permit. Each of the effluent monitoring requirements from the previous permit was evaluated to determine whether the requirements should be continued, updated or eliminated.

The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The minimum levels in Table 4 of the permit must be achieved. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 3
Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	Mgd	Effluent	Continuous	Recording
BOD_5	mg/L	Influent and Effluent[1]	2/week	24-hour composite

Table 3
Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
	lbs/day	Effluent	2/week	Calculation
	% Removal	---	---	Calculation
TSS	mg/L	Influent and Effluent[1]	2/week	24-hour composite
	lbs/day	Effluent	2/week	Calculation
	% Removal	---	---	Calculation
pH	standard units	Effluent	5/week	Grab
E.coli	colonies/100 ml	Effluent	5/month	Grab
Total Ammonia as N	mg/L	Effluent	1/week	24-hour composite
Total Phosphorus	lbs/day	Effluent	1/week	24-hour composite
TR Arsenic[2]	µg/L	Effluent	1 per 2 months	Grab
TR Cadmium[2]	µg/L	Effluent	1 per 2 months	Grab
TR Chromium[2]	µg/L	Effluent	1 per 2 months	Grab
TR Copper[2]	µg/L	Effluent	1 per 2 months	Grab
TR Mercury[2,3]	µg/L	Effluent	1/quarter	Grab
TR Nickel[2]	µg/L	Effluent	1 per 2 months	Grab
TR Silver[2]	µg/L	Effluent	1 per 2 months	Grab
TR Zinc[2]	µg/L	Effluent	1 per 2 months	Grab
Cyanide[2]	µg/L	Effluent	1 per 2 months	Grab
NPDES Application Form 2A Effluent Testing Data	mg/L	Effluent	3x/5 years	See footnote 4
NPDES Application Form 2A Expanded Effluent Testing	---	Effluent	1 each in 2nd, 3rd, & 4th years of the permit	See footnote 5
NPDES Application Form 2A Whole Effluent Toxicity (WET)	TU_c	Effluent	Quarterly during fourth year of permit	24-hour composite

1. Influent and effluent composite samples shall be collected during the same 24-hour period.
2. TR means total recoverable Arsenic, cadmium, chromium, copper, cyanide, lead, nickel, silver and zinc, must be analyzed as total recoverable. Mercury must be analyzed as total.
3. Method 1631E or 245.7
4. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6.
5. For Expanded Effluent Testing, in accordance with instructions in NPDES Application Form 2A, Part D and in

the second, third and fourth years of the permit.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) tests are laboratory tests that measure the total toxic effect of an effluent on living organisms. Whole effluent toxicity tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. There are two different types of toxicity test: acute and chronic. An acute toxicity test is a test to determine the concentration of effluent or ambient waters that causes an adverse effect (usually death) on a group of test organisms during a short-term exposure (e.g., 24, 48, or 96 hours). A chronic toxicity test is a short-term test, usually 96 hours or longer in duration, in which sublethal effects (e.g., significantly reduced growth or reproduction) are usually measured in addition to lethality. Both acute and chronic toxicity are measured using statistical procedures such as hypothesis testing (i.e., no observable effect concentration, NOEC and lowest observable effect concentration, LOEC) or point estimate techniques (i.e., lethal concentration to 50 percent of organisms, $LC_{50;}$ and inhibition concentration in a biological measurement to 25 percent of organisms, IC_{25}).

Federal regulations at 40 CFR §122.44(d) (1) require that NPDES permits contain limits on whole effluent toxicity when a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a State's numeric or narrative water quality criteria for toxicity. In Idaho, the relevant water quality standards for toxicity states that surface waters of the State shall be free from toxic substances in concentrations that impair designated beneficial uses. Since Idaho does not have numeric water quality criteria for toxicity, the EPA Region 10 uses the Toxic Units (TU) approach for acute (0.3 TUa) and chronic criteria (1 TUc). The use of TU as a mechanism for quantifying instream toxicity when a State lacks numeric criteria is described in Sections 2 and 3 of the 1991 Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) (TSD).

The current permit does not contain effluent limitations because the EPA has determined that the discharge does not have the reasonable potential to cause or contribute to an excursion above Idaho's narrative criteria for toxicity. As a result, the EPA is not including an effluent limitation for WET in this permit reissuance. However, the EPA is requiring WET monitoring for chronic toxicity**.** The rationale for the EPA's reasonable potential determination and WET monitoring requirements are provided below.

Rationale for Reasonable Potential Determination:

When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criteria for toxicity, the permitting authority can use a variety of factors and information. Some of these factors include, but are not limited to, the amount of available dilution, type of industry or POTW, existing data, type of receiving water and designated uses and history of compliance.

Existing Data

Acute and chronic toxicity tests conducted in 2003 found no statistical difference in response between effluent dilutions and controls.

		NOEC	LOEC
Ceriodaphnia Dubia	Survival	100%	100%
	Reproduction	100%	100%
Fathead Minnow	Survival	100%	100%
	Growth	100%	100%

Chronic toxicity was not found in either toxicity test at a dilution of less than or equal to 100.0 percent effluent.

Type of POTW

As shown on page 5 of this fact sheet, food processors and a laundry are the only significant industrial users under 40 CFR Part403.3(t). Significant discharges are defined as discharging more than 25,000 gallons per day of process wastewater to a POTW. Categorical standards apply for pH, TSS and BOD_5. Toxics are not generally characterized for the food process industry or laundries. TSS, BOD_5, oil and grease and pH are the pollutants that characterize these source categories. The primary and secondary treatment at Blackfoot's facility is designed to treat these pollutants.

Given the large amount of dilution available, the existing data that indicates that the effluent does not contain individual toxics, the type of POTW in question, and the finding of no toxicity during the previous toxicity test, the EPA has determined that Blackfoot's WWTP does not have a reasonable potential to cause or contribute to an excursion above Idaho's water quality standard for toxics. Therefore, an effluent limitation for WET is not included in this permit reissuance.

Rationale for WET Monitoring:

As previously mentioned, the EPA is requiring WET monitoring for chronic toxicity in this permit reissuance. Section 3.3 of the TSD recommends that WET monitoring be repeated at a frequency of at least once every five years. Toxicity monitoring has not been required for more than 10 years. Additionally, applications for reissuance of NPDES permits for POTWs greater than or equal to 1.0 MGD require at a minimum quarterly testing for a 12-month period within the last year of the expiration date or one test each year in the last four and one-half years of the permit. To account for seasonal variability, the EPA is requiring quarterly monitoring during the last year of the permit.

Section 3.3 of the TSD recommends that a discharger conduct chronic toxicity testing if the dilution of the effluent is less than 100:1 at the edge of the mixing zone. The dilution ratio of the effluent is 38.5 acute and 45.3 chronic. Therefore, the EPA is requiring WET monitoring for chronic toxicity only.

D. Surface Water Monitoring

Surface water monitoring is required for all pollutants detected and reported on Application Form 2A Part D. Hardness is required to calculate the criteria of certain metals in the Snake River. Surface water monitoring must start 90 days after the effective date of the permit and continue until 12 samples are obtained for each pollutant. The program must meet the

following requirements:

1. Monitoring stations must be established in the Snake River, above the influence of the facility's discharge.
2. The permittee must seek approval of the surface water monitoring stations from IDEQ.
3. A failure to obtain IDEQ approval of surface water monitoring stations does not relieve the permittee of the surface water monitoring requirements of this permit.
4. To the extent practicable, surface water sample collection must occur on the same day as effluent sample collection.
5. All ambient samples must be grab samples.
6. Arsenic, cadmium, chromium, copper, cyanide, lead, nickel, silver, and zinc must be analyzed as dissolved. Mercury must be analyzed as total recoverable.
7. Samples must be analyzed for the parameters listed in Table 4, and must achieve minimum levels (MLs) that are equivalent to or less than those listed. Table 4 is based on parameters that showed detectable levels in the Expanded Effluent testing data submitted with the permittee's application for renewal. The permittee may request different MLs. The request must be in writing and must be approved by the EPA.

Table 4: Surface Water Monitoring Requirements

Parameter	Units	Upstream Sampling Frequency	Minimum Levels (ML)
Total Ammonia as N	mg/L	Monthly	0.10
Arsenic	µg/L	Once per 2 months	2
Cadmium	µg/L	Once per 2 months	0.5
Chromium	µg/L	Once per 2 months	2
Copper	µg/L	Once per 2 months	1
Mercury	µg/L	Once per 2 months	5.0 ng/L (0.005 µg/L)
Nickel	µg/L	Once per 2 months	5 µg/L
Silver	µg/L	Once per 2 months	0.5 µg/L
Zinc	µg/L	Once per 2 months	5 µg/L
Cyanide	µg/L	Once per 2 months	10 µg/L
Hardness as $CaCO_3$	mg/L	Once per 2 months	5 mg/L
pH	Standard Units	Once per 2 months	0.1

8. Quality assurance/quality control plans for all the monitoring must be documented in the Quality Assurance Plan required under Part II.B., “Quality Assurance Plan”.
9. Surface water monitoring results must be reported on the DMR.

VI. SLUDGE (BIOSOLIDS) REQUIREMENTS

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

In the absence 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. Since the 40 CFR Part 503 regulations are self-implementing, the permittees must comply with them whether or not a permit has been issued.

The proposed permit requires the permittee to submit a biosolids permit application (NPDES Form 2S) before sewage sludge is removed from the lagoon. The application is required by 40 CFR 122.21(a)(i), 122.21(a)(ii)(H), and 122.21(c)(2). The regulations require 180 days so the EPA has time to evaluate the information, ask for additional information and prepare the permit.

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan Implementation

The federal regulation at 40 CFR §122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted to the EPA are accurate and to explain data anomalies if they occur. The permittee is required to develop or update and implement a Quality Assurance Plan within 90 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures that 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 the EPA and IDEQ upon request.

B. Operation and Maintenance Plan Implementation

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

C. Sanitary Sewer Overflows and Proper Operation and Maintenance

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 the 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 likelihood of human exposure or of unanticipated bypasses and upsets that exceed 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, 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 the EPA inspectors to evaluate a collection systems 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. Electronic Submission of Discharge Monitoring Reports

The draft permit includes new provisions to allow the permittee the option to submit

Discharge Monitoring Report (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 and IDEQ.

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.

E. Additional Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are based on federal regulations, they cannot be challenged in the context of an individual 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) and the U.S. Fish and Wildlife Service (FWS) if their actions could adversely affect any threatened or endangered 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. Blackfoot's WWTP is located more than 400 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.

FWS listed species in Idaho include fish, mollusks, or amphibians. Based on the USFW website none of the listed species are in Bingham County the location of Blackfoot's WWTP discharge. Therefore, the EPA determines the discharges from Blackfoot's WWTP will have no effect on listed species.

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 the EPA to consult with NOAA National Marine Fisheries Service 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 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.

The area of the discharge is not designated critical habitat for Bull Trout as stated in 50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States; Final Rule, October 18, 2010. The EPA determines that issuance of this permit has no affect on EFH.

C. State Certification

Section 401 of the CWA requires the EPA to seek State certification before issuing a final permit. As a part of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with State water quality standards.

D. Permit Expiration

The permit will expire five years from the effective date of the permit.

IX. DEFINITIONS AND ACRONYMS

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
AML	Average Monthly Limit
BOD_5	Biochemical oxygen demand, five-day
ºC	Degrees Celsius
cfs	Cubic feet per second
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
ESA	Endangered Species Act
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ml	milliliters
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit (depending on the context)
NOAA	National Oceanographic 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

s.u.	Standard Units
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document (EPA, 1991)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet radiation
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

X. REFERENCES

1. City of Blackfoot, ID, NPDES permit, effective November 28, 2000 to November 28, 2005.
2. Idaho Administrative Procedures Act (IDAPA), 2006. Section 58, Water Quality Standards and Wastewater Treatment Requirements. Idaho Department of Environmental Quality Rules, Title 01, Chapter 02.
3. U.S. EPA, 1973. *Water Quality Criteria 1972* (EPA R3-73-033).
4. EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.
5. EPA, 1996. U.S. EPA NPDES Permit Writer's Manual, US Environmental Protection Agency, Office of Water, EPA-833-B-96-003.
6. Metcalf and Eddy, Inc., 1979. Wastewater Engineering, Treatment, Disposal, Reuse;

Appendix A – Location Map

Appendix B – Basis for Effluent Limitations

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

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. The EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to 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. The federally promulgated secondary treatment effluent limits are listed in Table B-1.

Table B-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.

Mass-based Limits

The federal regulations at 40 CFR §122.45(b) and (f) require that POTW limitations to be expressed as mass-based limits using the design flow of the facility. The mass-based limits, expressed in lbs/day, are calculated as follows based on the design flow:

Mass-based limit (lbs/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

The mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 3.2 mgd × 8.34 = 801 lbs/day

Average Weekly Limit = 45 mg/L × 3.2 mgd × 8.34 = 1,200 lbs/day

B. Water Quality-Based Effluent Limits

Statutory Basis for Water Quality-Based Limits

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.

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/tribal water quality standard, including state/tribal narrative criteria for water quality.

The regulations require that this evaluation be made 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 based on chemical specific numeric criteria are needed, a projection of the receiving water concentration downstream of where the effluent enters the receiving water for each pollutant of concern is made. The chemical-specific concentration of the effluent and receiving water and, if appropriate, the dilution available from the receiving water are factors used to project the receiving water concentration. If the projected concentration of the receiving water exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it is appropriate to allow a small volume of receiving water to provide dilution of the effluent; these volumes are called mixing zones. Mixing zone allowances will increase the allowable mass loadings of the pollutant to the water body and decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the concentration of the pollutant of concern in the receiving water is below the numeric criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by the State. The State of Idaho authorized a mixing zone of 25 percent of the receiving water resulting in an acute dilution ratio of 61.1 to 1, a chronic dilution ratio of 71.1, and a chronic dilution ratio for ammonia of 91.4 to 1.

Qe = maximum effluent flow = 3.2 mgd = 4.95 CFS

1Q10 = upstream low flow = 1190 CFS

$$\text{Acute dilution ratio} = \frac{4.95 + 1190(0.25)}{4.95} = 61.1$$

7Q10 = upstream low flow = 1400 CFS

$$\text{Chronic dilution ratio} = \frac{4.95 + 1400(0.25)}{4.95} = 71.1$$

For ammonia

30B3 = 1790 CFS

Chronic dilution ratio = $\frac{4.95 + 1790(0.25)}{4.95} = 91.4$

Procedures 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.

C. Facility-Specific Water Quality-based Limits

Once the WLA has been developed, the EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability (using the CV), sampling frequency and the difference in time frames between the monthly average and daily maximum limits.

Floating, Suspended or Submerged Matter/Oil and Grease

The Idaho Water Quality Standards (IDAPA 58.01.02.200.05) require surface waters of the State to be free from floating, suspended or submerged matter of any kind in concentrations causing nuisance or objectionable conditions that may impair designated beneficial uses. A narrative condition is proposed for the draft permit that states there must be no discharge of floating solids or visible foam or oil and grease other than trace amounts.

Total Suspended Solids (TSS)

In translating the WLA of 72.5 tons per year into permit limits, the EPA followed procedures in the TSD.

The NPDES regulations at 40 CFR §122.45(d) require that permit limits for publicly owned treatment works (POTWs) be expressed as average monthly limits (AMLs) and average weekly limits (AWLs), unless impracticable. Since TSS is not a toxic pollutant, the EPA believes that applying the WLA as a monthly and weekly average is appropriate.

The NPDES regulations at 40 CFR §122.45(d) require that permit limits for publicly owned treatment works (POTWs) be expressed as average monthly limits (AMLs) and average weekly limits (AWLs), unless impracticable. The WLA must be statistically converted to average weekly and average monthly permit limits.

The WLA is 72.5 tons per year.

72.5 *tons/year × 2000 lbs/ton ÷ 365 days/year = 397 lbs/day (annual average)*

Assume LTA = 397 lbs/day:

$AML = LTA \times exp[z\sigma_n - 0.5\sigma_n^2]$ *(from Table 5-2 of the TSD)*

Where:

CV = coefficient of variation = 0.98 (based on facility data from (2007 – 2010)

n = 8 (number of samples in a month)

$\sigma_8^2 = \ln((CV^2/n) +1) = \ln((0.98^2/8) +1) = 0.113$

$\sigma_8 = 0.336$

Z = percentile exceedance probability for AML (95%) = 1.645

$AML = 397 \times exp[(1.645 \times 0.336) – (0.5 \times 0.113)]$

$AML = 652$ *lbs/day*

$$AWL = \frac{\exp[z_m\sigma_2 – 0.5\sigma_2^2]}{\exp[z_a\sigma_8 – 0.5\sigma_8^2]} \times AML$$

Where:

CV = coefficient of variation = 1.08

n = 8 (the number of samples per month)

$\sigma_2^2 = \ln((CV^2/n) +1) = \ln((1.08^2/2) +1) = 0.459$

$\sigma_2 = 0.668$

Z_m = percentile exceedance probability for AWL (99%) = 2.326

Z_a = percentile exceedance probability for AML (95%) = 1.645

$$AWL = \frac{\exp[(2.326 \times 0.668) – (0.5 \times 0.459)]}{\exp[(1.645 \times 0.336) – (0.5 \times 0.113)]} \times 652$$

AWL = 2.29 x 652 = 1,492 lbs/day

These water quality based loading limits are compared with the technology based effluent limits in Table B- 2, below.

Table B-2 Comparison of Technology-based and Water quality-based Limits for TSS		
Parameter	**Average Monthly Limit**	**Average Weekly Limit**
Technology-based	801 lbs/day	1,200 lbs/day
Water quality-based	652 lbs/day	1,492 lbs/day
Most stringent	**652 lbs/day**	**1,492 lbs/day**

The water quality based mass limits are more stringent and are selected and applied in the draft permit.

pH

The Idaho Water Quality Standards (IDAPA 58.01.02.250.01.a) require surface waters of the State to have a pH value within the range of 6.5 - 9.5 standard units. It is anticipated that mixing zones will not be authorized for the water quality-based criterion for pH. Therefore, this criterion must be met when the effluent is discharged to the receiving water. The technology-based effluent limits for pH are 6.0 - 9.0 standard units. To ensure that both water quality-based requirements and technology-based requirements are met, the draft permit incorporates the more stringent lower limit of the water quality standards (6.5 standard units) and the more stringent upper limit of the technology-based limits (9.0 standard units).

Ammonia, Total (as Nitrogen)

The Idaho Water Quality Standards contain criteria for the protection of aquatic life from the toxic effects of ammonia (IDAPA 58.01.02.250.01.d.). The water quality standards apply the criteria for early life stages to water bodies (IDAPA 58.01.02.250.01.d.(3)). 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. Fresh water ammonia criteria are calculated according to the equations in Table B-3.

Table B-3 Water Quality Criteria for Ammonia	
Acute Criterion	**Chronic Criterion**
$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$

The acute and chronic criteria are derived from the annual 95th percentiles of pH and temperature.

95th Percentile Ambient pH	8.7
95th Percentile Ambient Temperature °C	18.5
Highest Background Ammonia mg/L	0.027
Highest Discharge Ammonia mg/L	35.4
Coefficient of Variation	1.81

The ammonia acute standard is 1.47 mg/L and the chronic standard is 0.602 mg/L. The reasonable potential analysis shows the facility's discharge can cause or contribute to an exceedance of the acute or chronic criteria, therefore, effluent limits are required.

The calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 99.

The effect of temperature on the nitrification-denitrification in the aeration basins to remove ammonia is significant. Temperature will significantly affect performance. Effluent quality deteriorates at low temperatures. (Wastewater Engineering, Treatment, Disposal, Reuse; Metcalf and Eddy, Inc., 1979)

Blackfoot cannot achieve the higher temperature summer ammonia removal rates during lower winter temperatures. Therefore, consistent with the existing permit, seasonal ammonia criteria are calculated. Winter effluent concentrations are lower when low temperatures deteriorate removal rates and a higher winter time criteria is calculated. Summer removal rates are higher during warmer temperatures resulting in lower ammonia effluent concentrations attainable by Blackfoot and a lower criteria is calculated.

Summer Time Criteria

95th Percentile Ambient pH	8.7
95th Percentile Ambient Temperature °C	20.3
Highest Background Ammonia mg/L	0.027
Highest Discharge Ammonia mg/L	35.4
Coefficient of Variation	2.18

Winter Time Criteria

95th Percentile Ambient pH	8.5
95th Percentile Ambient Temperature °C	14.2
Highest Background Ammonia mg/L	0.020
Highest Discharge Ammonia mg/L	29.6
Coefficient of Variation	1.55

Summer Time Dilution Ratios for Ammonia

30B3 = 1800 CFS

Chronic dilution ratio = $\frac{4.95 + 1790(0.25)}{4.95}$ = 91.4

1Q10 = 1590

Acute dilution ratio = $\frac{4.95 + 1590(0.25)}{4.95}$ = 81.3

Winter Time Dilution Ratios for Ammonia

30B3 = 1800 CFS

Chronic dilution ratio = $\frac{4.95 + 1790(0.25)}{4.95}$ = 91.4

1Q10 = 1170 CFS

Acute dilution ratio = $\frac{4.95 + 1170(0.25)}{4.95}$ = 60.0

Seasonal Information for Blackfoot Discharge		
	April 1 – September 30 (summer)	October 1 – March 31 (winter)
1Q10 cfs	1,590	1,170
30B3 cfs	1,790	1,790
acute NH3 criterion mg/L	1.47	2.14
chronic NH3 criterion ug/L	0.536	1.09
ambient pH S.U.	8.7	8.5
ambient temperature, °C	20.3	14.2
ambient NH3 concentration, mg/L	0.027	0.020
Dilution Ratio Acute	81.3	60.0
Dilution Ratio Chronic	91.4	91.4
NH3 limits, average monthly, mg/L	37.6	43.7
NH3 limits, daily maximum, mg/L	117	127

The effluent limitations developed with the latest data are less stringent than the limits in the existing permit. Ambient data is from the USGS Station near Shelly. However, Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit. Therefore the limits remain unchanged.

Lead

The Idaho Water Quality Standards contain criteria for the protection of aquatic life from the toxic effects of lead (IDAPA 58.01.02.210.02). These standards are dependent on hardness ($CaCO_3$) of the receiving water, and toxicity of lead to aquatic life increases as hardness decreases. The minimum hardness used in equations to determine water quality standards is 25 mg/l, even if ambient levels are less.

The equations for lead water quality standards are the following, with units of µg/L:

Acute Standard=WER exp{mA[ln(hardness)]+bA} X Acute Conversion Factor

Chronic Standard=WER exp{mc[ln(hardness)]+bc} X Chronic Conversion Factor

For lead, factors in the equations are the following: mA=1.273, bA= -1.460, mc=1.273, bc= -4.705. Acute and Chronic Conversion Factors, which allow conversion from dissolved concentrations to total recoverable for effluent limits, and each 0.791. WER, a Water Effect Ratio, is 1.0 unless the Idaho water quality standards specify a different number for a particular water body. No number is assigned for the Snake River, so the default of 1.0 will be used.

Based on upstream monitoring data from May 2002 to December 2003, the maximum ambient lead concentration was 1.9 µg/L, dissolved; the minimum hardness value was 113 mg/L. The maximum lead effluent value was 5 µg/L, total recoverable, based on monitoring data from April 2001 to June 2010; this was based on 8 samples, with a coefficient of variation of 0.91. Substituting in the equations above:

Acute Standard = 0.791 exp{1.273[ln(113]-1.46}= 75.45 ug/L

Chronic Standard=0.791 exp{1.273[ln(113)]-4.705}= 2.94 ug/L

The reasonable potential analysis demonstrates no reasonable potential for the facility's discharge to cause or contribute to an exceedance of the acute or chronic criterion, therefore, no effluent limits are required and monitoring is not required. Monitoring for lead is discontinued.

Escherichia coli (E. coli) Bacteria

The Snake River at the point of discharge is designated for primary contact recreation. Waters of the State of Idaho that are designated for recreation are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml as a geometric mean based on a minimum of five samples taken every three to seven days over a thirty day period (IDAPA 58.01.02.251.01.a). The draft compliance monitoring schedule contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml and a minimum sampling frequency of 3 grab samples a week providing 12 samples in 30 days consistent with this averaging period.

The Idaho Water Quality Standards also state that for primary contact recreation a single water sample that exceeds 406 organisms/100 ml indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. (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 (EPA, 1991). Because a single sample value exceeding 406 organisms/100 ml may indicates an exceedance of the geometric mean criterion, the EPA

has included an instantaneous (single grab sample) maximum effluent limit for *E. coli* of 406 organisms/ 100 ml, in addition to a monthly geometric mean limit of 126 organisms/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 the geometric mean criterion for *E. coli* and provide warning of and opportunity to avoid possible non-compliance with the geometric mean criterion.

Fecal Coliform

The EPA approved the adoption to the Idaho Water Quality Standards removing fecal coliform as the bacteria standard and replacing it with *E. coli*. *E. coli* limits replace the previous fecal coliform bacteria limits in compliance with updated Idaho Water Quality Standards.

Temperature

The Idaho Water Quality Standards limit ambient water temperature to 19 degrees C daily maximum. The point of compliance with temperature is at the edge of the chronic mixing zone at critical conditions. Critical conditions are at the highest ambient water temperatures.

The 95th percentile temperature observed in the Snake River upstream from the discharge for the year is 18.5 ºC. The 99th percentile effluent temperature based on DMR data is 26.5 °C over three years. The chronic dilution ratio is 71.1.

To determine reasonable potential calculate the temperature at the edge of the chronic mixing zone ($T_{chronic}$) during critical conditions:

$$T = T_{ambient95} + (T_{effluent99} - T_{ambient95})/DF.$$

$$T = 18.5 + (26.5 - 20.3)/71.1$$

$$T = 18.6 < \text{criterion (19)}$$

Therefore, Blackfoot does not have a reasonable potential to violate the water quality standards of the State of Idaho and an effluent limitation and monitoring are not required. Temperature monitoring is discontinued.

Total phosphorus

As discussed on Page 8 of the fact sheet, the WLA for phosphorus is an annual average value of 7.10 tons per year. However, effluent limits in NPDES permits for POTWs that discharge continuously must be expressed as average monthly and average weekly limits (40 CFR 122.45(d)(2)).

As stated in Section 5.3.1 of the *Technical Support Document for Water Quality-based Toxics Control* or TSD, when the averaging periods for effluent limits differ from those of the water quality criteria (and therefore the wasteload allocation, which is calculated from the water quality criteria), it is necessary to use statistics to develop permit limits that consider effluent variability while ensuring a low probability that the WLA will be exceeded.

Since the wasteload allocation is an annual average value, EPA will consider it to be a long term average. In Table 5-2, the TSD contains an equation for calculating an average monthly

permit limit that is consistent with a long term average wasteload allocation, along with a table of results for the equation for various values of the coefficient of variation (CV) and various sampling frequencies. In this case, the coefficient of variation is equal to 0.58. EPA proposes a sampling frequency for phosphorus of one time per week. This will result in at least 4 phosphorus samples per month.

The probability basis is probability that the permittee will comply with the average monthly effluent limit, if the permittee's long term average and coefficient of variation are consistent with the assumptions used in the calculation of the average monthly limit. In general, for toxics permitting, the TSD recommends the use of the 95th percentile (5% exceedance probability) for the average monthly limit. This is a conservative approach, which is justified when establishing effluent limits for toxic pollutants, but this conservative approach, which is justified when establishing effluent limits for toxic pollutants, is not necessary when establishing effluent limits for nutrients, where the goal is to achieve a certain annual average loading or concentration. Therefore, EPA has used the 99th percentile (1% exceedance probability) to calculate the average monthly limit

Calculating the Average Monthly Limit

The WLA is 7.10 tons per year.

7.10 *tons/year × 2000 lbs/ton ÷ 365 days/year = 38.9 lbs/day (annual average)*

Assume LTA = 38.9 lbs/day:

$AML = LTA \times exp[z\sigma_n - 0.5\sigma_n^2]$ *(from Table 5-2 of the TSD)*

Where:

CV = coefficient of variation = 0.58 (based on facility data from October 2007 – Sept 2010)

n = 4 (number of samples in a month)

$\sigma_4^2 = \ln(CV^2/4) + 1) = \ln(0.58^2/4) + 1) = 0.0808$

$\sigma_4 = 0.284$

Z = percentile exceedance probability for AML (99%) = 2.3263

$AML = 38.9 \times exp[(2.3263 \times 0.284) - (0.5 \times 0.0808)]$

AML = 72.3 lbs/day

Calculating the Average Weekly Limit

AWL = 72.3 x 1.5 = 108 lbs/day

REASONABLE POTENTIAL FOR AQUATIC LIFE

		State Water Quality Standard		Max concentration at edge of...										
Ambient	Conc.	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQ'D?**	Effluent percentile value		Max effluent conc. measure	Coeff Variation	# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	*Mg/L*	*mg/L*	mg/L	*mg/L*	*mg/L*			*Pn*	*mg/L*	*CV*	*n*			
Lead		0.0754	0.0029	0.00035	0.00030	NO	0.99	0.562	0.005	0.91	8	5.41	61.1	71.1
Ammonia	0.027	1.47	0.602	2.39	1.61	YES	0.99	0.880	35.4	1.81	36	4.1	61.1	91.4

Water Quality Based Limits

	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)				
PARAMETER			*mg/L*	*mg/L*	*mg/L*	mg/L	mg/L				
Ammonia Summer	74	29	0.027	1.5	0.54	37.6	117				
Ammonia Winter	81	62	0.020	2.1	1.1	43.7	127				
	Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations							Statistical variables for permit limit calculation			
	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	LTA Prob'y Basis	Limiting LTA	Coeff. Var. (CV)	AML Prob'y Basis	MDL Prob'y Basis	# of Samples per Month
PARAMETER	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*decimal*	*decimal*	*mg/L*	*decimal*	*decimal*	*decimal*	*n*
Ammonia Summer	117	46.5	13.0	20.7	2.18	0.99	13.0	2.18	0.95	0.99	4.0
Ammonia Winter	127	97.8	17.9	20.6	1.55	0.99	17.9	1.55	0.95	0.99	4.0