FACT SHEET

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

The City of Aberdeen Wastewater Treatment Facility
33 North Main Street
Aberdeen, Idaho 83210

NPDES Permit Number:	ID0020176
Public Notice Start Date:	July 1, 2015
Public Notice Expiration Date:	July 30, 2015
Technical Contact:	John Drabek, 206-553-8257, drabek.john@epa.gov 1-800-424-4372 ext. 3-8257 (within Region 10)

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, #300
Pocatello, ID 83201
ph: (208) 236-6160
fx: (208) 236-6168

Public Comment

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

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

Documents are Available for Review.

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

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 permits are available at:

EPA Idaho Operations Office
950 W Bannock, Suite 900
Boise, ID 83702
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

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
AML	Average Monthly Limit
AWL	Average Weekly Limit
BE	Biological Evaluation
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
Gpd	Gallons per day
HUC	Hydrologic Unit Code
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation

lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
Ml	milliliters
ML	Minimum Level
µg/L	Micrograms per liter
Mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NEPA	National Environmental Policy Act
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
SIC	Standard Industrial Classification
SS	Suspended Solids
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
Water Quality	Water Quality Standards

Standards

WWTP Wastewater treatment plant

I. APPLICANT

A. General Information

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

Facility Name:
City of Aberdeen Wastewater Treatment Plant
NPDES Permit # ID0020176

Facility Address:
33 North Main Street
Aberdeen, Idaho 83210

Mailing Address:
P.O. Box 190
Aberdeen, Idaho 83210

Contact:
Robert Goss, Public Works Superintendent, (209) 397 – 4161

B. Permit History

The most recent NPDES permit for the City of Aberdeen was issued on September 26, 2001, expired on September 26, 2006. An NPDES application for permit issuance was submitted by the permittee on August 30, 2006. The permit has been administratively extended and remains fully effective and enforceable. An updated NPDES application was received from the permittee on January 23, 2015.

II. FACILITY INFORMATION

A. Treatment Plant Description

Service Area

The City of Aberdeen (City) owns and operates the Aberdeen Wastewater Treatment Facility (WWTF) that treats domestic sewage that is primarily from local residents and commercial establishments through a separate sanitary sewer system. The facility serves 1,992 resident population in the City of Aberdeen. There are no significant industrial users. The facility does receive industrial waste from three fresh pack potato operations; Idaho Select, Inc., Sun River of Idaho, Inc., and Pleasant Valley Potato, Inc. Approximately 35% of the daily wastewater flow and up to 90% of the daily five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) loadings can be contributed by these operations during periods of increased industrial production. A map showing the location of the treatment facility is included in Appendix A.

Treatment Process

The design flow of the facility is 0.82 mgd. The wastewater treatment plant has undergone considerable upgrades with a startup date of July of 2012. The upgrades to the treatment process include the following:

- New headworks building with automatic cylindrical bar screen and grit separation
- Standby diesel generator for backup plant power
- New lift station
- New IFAS system (Integrated Fixed-Film Activated Sludge) or RBC to replace the biotower and aeration basin processes
- New rectangular clarifier (Clarifier #1)
- Digester improvements including increased digester capacity by converting the aeration basin to digester basin
- Drying bed flood elevation protection
- Replacement of influent and effluent flow meters: influent is open channel meter, effluent is in-pipe mag-meter
- Plant SCADA system including operation tracking and alarms
- UV disinfection system to replace chlorine contact chamber; chlorine system will remain as backup disinfection system
- Rectangular Clarifier #2 (redundant clarifier)
- Fiberglass clarifier covers for freezing protection
- Access platforms for digesters, clarifiers, and IFAS system

The City estimates that inflow and infiltration is about 8,000 gallons per day. Collection system improvements are scheduled to begin in the summer of 2015.

The only violation of the effluent limitations was one exceedance of the instantaneous *E. coli* limit.

B. Background Information

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, additional discharge data, and the nature of the discharge. The wastewater treatment process for this facility includes both primary and secondary treatment, as well as disinfection with UV. Pollutants typical of a sewage treatment plant expected in the discharge include BOD_5, TSS, *E. coli* bacteria, pH, ammonia and phosphorus. Based on this analysis, pollutants of concern are as follows:

- BOD5
- TSS
- *E. coli* bacteria
- pH
- Ammonia
- Phosphorus

The concentrations of pollutants in the discharge were reported in the NPDES application and in DMRs and were used in determining reasonable potential for several parameters (see Appendix B). The monitoring data used was representative of the effluent following treatment system improvements.

III. RECEIVING WATER

WWTP discharges directly to Hazard Creek/Little Hole Draw, a tributary to American Falls Reservoir.

Beneficial uses include for this segment of the Snake River are cold water communities, primary contact recreation and domestic water supply. The outfall is located at latitude 42° 56' 30" N and longitude 112° 50' 15" W.

A. Water Quality Standards

Overview

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limitations in permits necessary to meet 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 that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Designated Beneficial Uses

This facility discharges to Hazard Creek/Little Hole Draw, a tributary to American Falls Reservoir. At the point of discharge, the receiving water is protected for the following designated uses (IDAPA 58.01.02**.**130.12):

- cold water communities
- primary contact recreation
- domestic water supply

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).

Surface Water Quality Criteria

The criteria are found in the following sections of the Idaho Water Quality Standards:

- The narrative criteria applicable to all surface waters of the State are found at IDAPA 58.01.02.200 (General Surface Water Quality Criteria).

- The numeric criteria for toxic substances for the protection of aquatic life and primary contact recreation are found at IDAPA 58.01.02.210 (Numeric Criteria for Toxic Substances for Waters Designated for Aquatic Life, Recreation, or Domestic Water Supply Use).

- Additional numeric criteria necessary for the protection of aquatic life can be found at IDAPA 58.01.02.250 (Surface Water Quality Criteria for Aquatic Life Use Designations).

- Numeric criteria necessary for the protection of recreation uses can be found at IDAPA 58.01.02.251 (Surface Water Quality Criteria for Recreation Use Designations).

- Water quality criteria for agricultural water supply can be found in the EPA's *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA R3-73-033) (See IDAPA 58.01.02.252.02)

The numeric and narrative water quality criteria applicable to the discharge are provided in Appendix B of this fact sheet.

Antidegradation

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

B. Water Quality Limited Waters

Any waterbody for which the water quality does not or is not expected to meet, applicable water quality standards is defined as a "water quality limited segment."

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

The State of Idaho's 2012 Integrated Water Quality Monitoring and Assessment Report (Integrated Report), designates this subbasin on the 303(d) list as impaired for nutrients and sedimentation. The State of Idaho developed the American Falls Subbasin Assessment and TMDL (IDEQ), May 2012 (TMDL). This TMDL reported that the American Falls Reservoir is impaired for nutrients with phosphorus the limiting nutrient:

Page: xxv:

"Aberdeen wastewater treatment plant – This point source contributes nutrients and some sediment to Hazard Creek/Little Hole Draw, and ultimately to American Falls Reservoir. The total phosphorus load allocation is 0.160 tons/year (Table ES-2a). The annual wasteload allocation for sediment is 7.3 tons. The total phosphorus load allocation requires a reduction of current estimated wasteloads, while the sediment wasteload allocation does not."

For sediment (TSS) the TMDL stated the following:

Page 69:

"Loading of total suspended solids does not appear to be significant. None of the four WWTPs discharged effluent at concentrations greater than 45 mg/L and concentrations at both Aberdeen and Blackfoot were less than 12 mg/L TSS (Table 2-20)."

Page 87:

"Recommended targets for point sources followed those for nonpoint sources, or were based on the operator's NPDES permit, whichever was the more restrictive target. For example, permit requirements for suspended solids at Aberdeen and Blackfoot WWTPs are monthly average of 30 mg/L and weekly average of 45 mg/L."

Footnote on Page 102 of Table 5-9. Wasteload analyses for point source (wastewater treatment plants and fish hatcheries) dischargers in American Falls Subbasin:

Footnote 2: "based on NPDES max monthly avg. concentration limits of 30 mg/L for Aberdeen"

The TSS allocation for Aberdeen is a monthly average of 30 mg/L and a weekly average of 45 mg/L. These are the same as the effluent limit guidelines for POTWs and the existing effluent concentration limitations.

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 is in Appendix B.

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 1 below presents the proposed effluent limits for 5-day biochemical oxygen demand (BOD_5), total

suspended solids (TSS), *Escherichia coli (E. coli)*, pH, total residual chlorine and the minimum percent removal requirements for BOD_5 and TSS.

Table 1
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%	--
	205 lbs/day	308 lbs/day		--
TSS	30 mg/L	45 mg/L	85%	--
	205 lbs/day	308 lbs/day		--
E. coli Bacteria	126 colonies /100mL[2]	--	--	406 colonies /100mL[3]
Total Phosphorus as P	38 lbs/day[4]	57 lbs/day[4]	--	--
Total Phosphorus as P	10.9 lb/day[5]	20.6 lbs/day[5]		
	Annual Average Limit 4.5 lbs/day[5]			
Total Residual Chlorine	0.021 mg/L			0.043 mg/L
	0.146 lbs/day			0.292 lbs/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. The monthly average for *E. coli* is the geometric mean of all samples taken during the month, based on a minimum of five samples, taken every 3-7 days within a calendar month.
3. Instantaneous maximum limit
4. Interim limits lasting four years and eleven months under the compliance schedule
5. Limit to be achieved four years and eleven months from the effective date of the permit.

The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L for this parameter. The EPA will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limitations if the average monthly and maximum daily concentration limits are less than 50 µg/L.

These proposed effluent limitations are either identical or more stringent to the effluent limitations in the current permit for the City of Aberdeen. Refer to Appendix B for the derivation of the effluent limits.

C. Compliance Schedule

The Idaho Water Quality Standards at IDAPA 58.01.02.400.03 allow compliance schedules that allow a discharger to phase in, over time, compliance with water quality based effluent limitations when limitations are in the permit for the first time. Aberdeen's water quality based effluent limits for total phosphorus are required for the first time.

Additionally, the federal regulation at 40 CFR 122.47 requires that the compliance schedules require compliance with effluent limitations as soon as possible and that, when the compliance schedule is longer than one year, the schedule shall set forth interim requirements and the dates for their achievement. The time between the interim dates shall generally not exceed one year and when the time necessary to complete any interim requirement is more than one year, the schedule shall require reports on progress toward completion of these interim requirements.

In order to grant a compliance schedule the permitting authority must make a reasonable finding that the discharger cannot immediately comply with the water quality based effluent limit upon the effective date of the permit and that a compliance schedule is appropriate (see 40 CFR 122.47 (a)). The EPA has found that the permittee needs a compliance schedule for total phosphorus. The Aberdeen facility was not upgraded for phosphorus control. Thus, Aberdeen is unable to achieve the new total phosphorus effluent limitation. The four year eleven month deadline in Condition I.C.1. is a common period for installation of treatment systems under NPDES permits and is therefore timely. For example this period of time was allowed in the compliance schedule for end of pipe treatment for the City of Weiser and the Eastern Idaho Regional Wastewater Authority, Oxbow Wastewater Treatment Plant,

The draft permit proposes an average monthly effluent limit of 7.0 lbs/day, a weekly limit of 13 lbs/day and an annual average limit of 4.5 lbs/day. In order to achieve the phosphorus effluent limitations Aberdeen must make physical modifications to its facility. Therefore, the discharge cannot be in compliance upon the effective date of the permit and a compliance schedule is appropriate.

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.

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

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

B. Effluent Monitoring Requirements

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

Table 2 below presents the proposed effluent monitoring requirements for the City. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

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

The permit requires monitoring BOD_5, TSS, *E. coli*, flow, pH, total phosphorus and total residual chlorine (when used for disinfection) to determine compliance with the effluent limits; it also requires monitoring of the influent for BOD_5 and TSS to calculate monthly removal rates. Temperature monitoring has been discontinued. The effluent monitoring frequency for total phosphorus has been increased to weekly to insure compliance with the weekly effluent limitations.

Ammonia

Ammonia effluent levels provide an indication of the operational efficiency of the wastewater treatment plant. In the proposed permit, ammonia effluent sampling will once again be required once per month. The City does not have a reasonable potential to violate water quality standards for ammonia even without a mixing zone, so the proposed permit contains no effluent limits for ammonia.

Table 2
Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	Recording
BOD_5	mg/L	Influent and Effluent[1]	1/week	Grab
	lbs/day		1/week	Calculation
	% Removal	---	1/week	Calculation
TSS	mg/L	Influent and Effluent[1]	1/week	Grab
	lbs/day		1/week	Calculation
	% Removal	---	1/week	Calculation
pH	standard units	Effluent	5/week	Grab
E.coli	colonies/100 ml	Effluent	5/month	Grab
Total Residual Chlorine[2]	mg/L	Effluent	1/week	Grab
Total Ammonia as N	mg/L	Effluent	1/month	Grab
Total Phosphorus as P	mg/L	Effluent	1/week	Grab

Table 2
Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
NPDES Application Form 2A Effluent Testing Data	mg/L	Effluent	3x/5 years	See footnote 3

1. Influent and effluent composite samples shall be collected over approximately the same time period.
2. Monitoring for total residual chlorine is required when chlorine or chlorine compounds are used for disinfection.
3. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6.

C. Surface Water Monitoring

The permittee must conduct surface water monitoring. Surface water monitoring must start immediately after the effective date of the permit and continue for 5 years. The program must meet the following requirements:

1. Monitoring stations must be established in Hazard Creek/Little Hole Draw (Aberdeen Drain) at the following locations 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. The flow rate must be measured as near as practicable to the time that other ambient parameters are sampled.
6. Samples must be analyzed for the parameters listed in Table 3. Surface Water Monitoring Requirements.
7. For all surface water monitoring, the permittee must use sufficiently sensitive analytical methods which meet the following:
   a) The method must detect and quantify the level of the pollutant, or
   b) The permittee must use a method that can achieve MLs less than or equal to those specified in Table 4. The permittee may request different MLs. The request must be in writing and must be approved by EPA.
8. Quality assurance/quality control (QA/QC) plans for all the monitoring must be documented in the Quality Assurance Plan required under Part Part II.B.
9. Submission of Surface Water Monitoring
   a) Surface water monitoring results must be reported on the monthly DMR.
   b) In addition, the permittee must submit all surface water monitoring results for

the previous calendar year for all parameters in an annual report to EPA and IDEQ by January 31st of the following year and with the application (see Part V.B of this permit, Duty to Reapply). The file must be in the format of one analytical result per row and include the following information: name and contact information of laboratory, sample identification number, sample location in latitude and longitude (decimal degrees format), method of location determination (i.e., GPS, survey etc.), date and time of sample collection, water quality parameter (or characteristic being measured), analysis result, result units, detection limit and definition (i.e., MDL etc.), analytical method, date completed, and any applicable notes.

Table 3
Surface Water Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Upstream	Continuous	Recording
pH	standard units	Upstream	1/quarter	Grab
Temperature	°C	Upstream	1/quarter	Grab
Total Ammonia as N	mg/L	Upstream	1/quarter	Grab

Notes:

1. For quarterly monitoring frequency, quarters are defined as: January 1 to Mach 31; April 1 to June 30; July 1 to September 30; and, October 1 to December 31.

Table 4 Receiving Water Monitoring MLs

pH	0.10
Temperature	0.2 °C
Total Ammonia as N	50 µg/L

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.

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 Permittee is required to update the Quality Assurance Plan for the City within 90 days of the effective date of the final permit. The Quality Assurance Plan must include standard operating procedures the permittee will follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the IDEQ upon request.

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 180 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. Any changes occurring in the operation of the plant shall be reflected within the Operation and Maintenance plan.

C. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR within six months of the effective date of the permit. 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. 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.

The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: http://www.epa.gov/netdmr. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

D. Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate,

disproportionately high and adverse human health or environmental effects of its programs, policies, and activities." The EPA strives to enhance the ability of overburdened communities to participate fully and meaningfully in the permitting process for EPA-issued permits, including NPDES permits. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. As part of an agency-wide effort, the EPA Region 10 will consider prioritizing enhanced public involvement opportunities for EPA-issued permits that may involve activities with significant public health or environmental impacts on already overburdened communities. For more information, please visit http://www.epa.gov/compliance/ej/plan-ej/.

As part of the permit development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities using a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

Aberdeen is located within or near a Census block group that is potentially overburdened because of the demographic of Risk Management Plan Facilities (81st percentile) and Major Direct Dischargers to Water (85th percentile). Region 10 Environmental Justice and NPDES permits staff conducted a more in-depth review of the facility including such factors as risk to public health. The EPA does not believe that the Aberdeen Wastewater Treatment plant presents an environmental justice concern. Disinfection, effluent limitations, monitoring, recording and reporting prevent threats to human health. In order to ensure that individuals near the facility are able to participate meaningfully in the permit process, the EPA is conducting the following enhanced outreach activities: The draft permit will be available at the Aberdeen Public Library. The draft permit does not include any additional conditions to address environmental justice.

Regardless of whether a facility/WWTP is located near a potentially overburdened community, the EPA encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the-permit-application-process#h-13). Examples of promising practices include: thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

E. Standard Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because 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. Aberdeen's WWTP is located more than 300 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 Aberdeen's WWTP discharge. Therefore, the EPA determines the discharges from Aberdeen'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.

B. State Certification

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

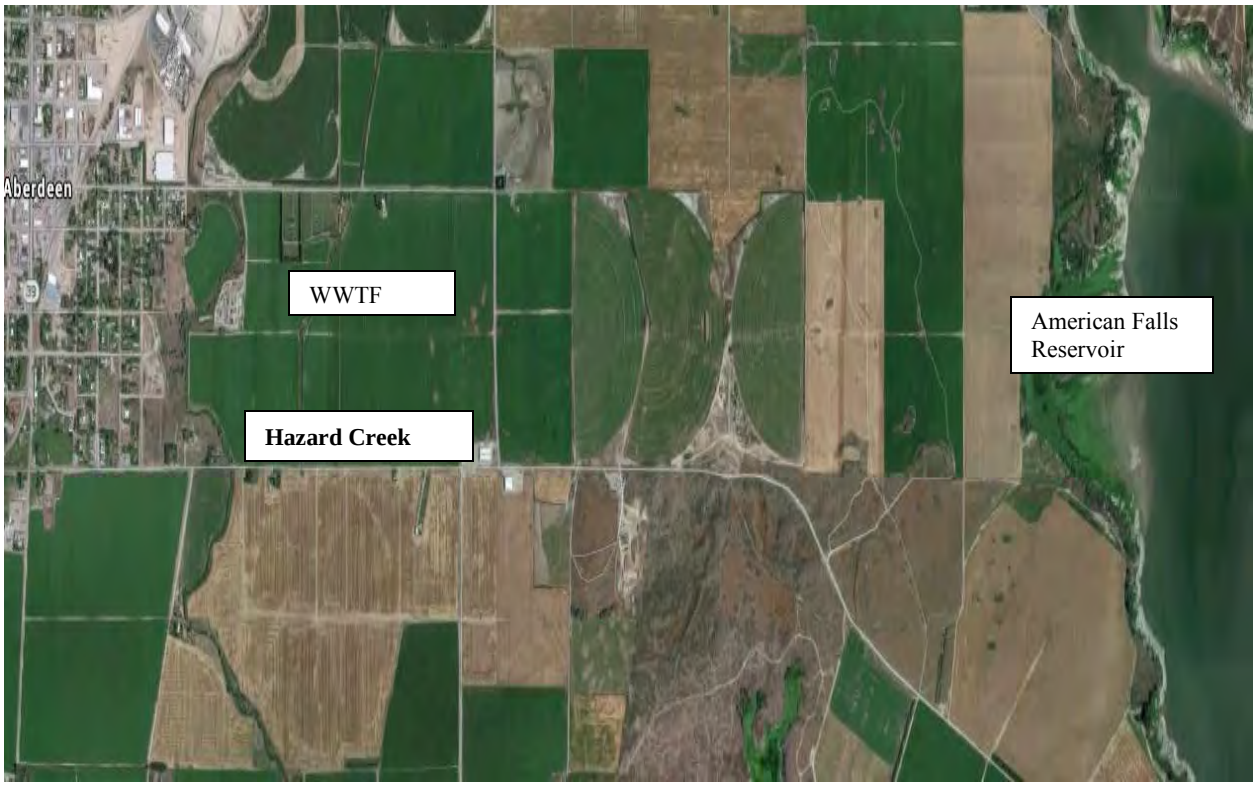
C. Permit Expiration

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

IX. REFERENCES

1. City of Aberdeen, ID, NPDES permit.
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, 2010. U.S. EPA NPDES Permit Writer's Manual, US Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.
6. Idaho Department of Environmental Quality, Pocatello Regionl Office, *American Falls Subbasin Daily Load Plan: Subbasin Assessment and TMDL*, May 2012

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, using 0.82 mgd for design flow, the same value used to calculate load limits in the current permit:

BOD_5 and TSS

Average Monthly Limit = 30 mg/L × 0.82 mgd × 8.34 = 205 lbs/day

Average Weekly Limit = 45 mg/L × 0.82 mgd × 8.34 = 308 lbs/day

Chlorine

The WWTF uses UV for disinfection of the effluent. However, chlorine capabilities are maintained as a means to disinfect the municipal wastewater prior to discharge. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment facility can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment 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. For technology-based effluent limits, 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.

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

Monthly average limit = 0.5 mg/L x 0.30 mgd x 8.34 = 1.3 lbs/day

Weekly average limit = 0.75 mg/L x 0.30 mgd x 8.34 = 1.9 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. 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 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.

The *Technical Support Document for Water Quality-Based Toxics Control* (EPA, 1991) (TSD) 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.

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.

Wasteload allocations are determined in one of the following ways:

1. TMDL-Based Wasteload Allocation

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

   To ensure that these waters will come into compliance with water quality standards Section 303(d) of the CWA requires States to develop TMDLs for those water bodies that will not meet water quality standards even after the imposition of technology-based effluent limitations. The first step in establishing a TMDL is to determine the assimilative capacity (the loading of pollutant that a water body can assimilate without exceeding water quality standards). The next step is to divide the assimilative capacity into allocations for non-point sources (load allocations), point sources (wasteload allocations), natural background loadings and a margin of safety to account for any uncertainties. Permit limitations are then developed for point sources that are consistent with the wasteload allocation for the point source.

2. Mixing zone based WLA

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

3. Criterion as the Wasteload Allocation

In some cases a mixing zone cannot be authorized, either because the receiving water is already at, or exceeds, the criterion, the receiving water flow is too low to provide dilution, or the facility can achieve the effluent limit without a mixing zone. In such cases, the criterion becomes the wasteload allocation. Establishing the criterion as the wasteload allocation ensures that the effluent discharge will not contribute to an exceedance of the criteria.

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.

The daily maximum limit is based on the CV of the data and the probability basis, while the monthly average limit is dependent on these two variables and the monitoring frequency. As recommended in the TSD, the EPA used a probability basis of 95 percent for monthly average limit calculation and 99 percent for the daily maximum limit calculation.

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.

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).

Escherichia coli (E. coli) Bacteria

The American Falls Reservoir/Snake River via the Hazard Creek/Little Hole Draw 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 five days over a thirty day period (IDAPA 58.01.02.251.01.a). The proposed 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 five grab samples per calendar month.

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 indicate 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.

Chlorine

Idaho water quality standards at IDAPA 58.01.02.210.01 establish a chlorine chronic aquatic life criterion of 11 μg/L and an acute aquatic life criterion 19 μg/L in the receiving waters. The City of Aberdeen does have a reasonable potential to violate the water quality standards for chlorine in the Hazard Creek/Little Hole Draw. Therefore, water quality based effluent limits for chlorine are required. WQBELs for chlorine have been established as 0.021mg/L as an average monthly limitation and 0.043 mg/L as a daily maximum limitation.

Total Phosphorus

The TMDL established a wasteload allocation for total phosphorus of 0.16 tons per year. 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)).

Calculating the Average Monthly Limit

$$\frac{0.16 \text{ tons/yr} \times 2000 \text{ lb/ton}}{365 \text{ days/yr}} = 4.50 \text{ lb/day (annual average)}$$

Assume LTA = 4.50 lb/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 = 0.6 (a default value for < 10 effluent samples, since only 3 phosphorus samples were reported under the current permit after the upgrade)

n = 4 (number of samples in a month)

$\sigma_4^2 = \ln((CV^2/n)+1) = \ln((0.6^2/4) + 1) = 0.0862$

$\sigma_4 = 0.294$

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

AML = 4.5 x exp[(1.645 x 0.294) – (0.5 x 0.0862)] = 6.98 lb/day

Calculating the Average Weekly Limit

The AWL is calculated from the following relationship with the AML (from Table 5-3 of the TSD):

$$AWL = \frac{\exp[z_m\sigma - 0.5\sigma^2]}{\exp[z_a\sigma_4 - 0.5\sigma_4^2]} \times AML$$

Where CV = 0.6, the default value, as above

$\sigma^2 = \ln(CV^2 + 1) = \ln(0.6^2 + 1) = 0.307$

$\sigma = 0.554$

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

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

$$AWL = \frac{\exp[(2.326 \times 0.554) - (0.5 \times 0.307]}{\exp[(1.645 \times 0.294) - (0.5 \times 0.0862)]} \times 6.98 \text{ lb/day}$$

AWL = 13.3 lb/day

Interim Limit

The interim limit is based on the highest measured phosphorus concentration and the current design flow of 0.82 mgd.

AML = 5.54 mg/L x 0.82 x 8.34 = 38 lbs/day

An average weekly limit (AWL) is derived using the following procedure from the TSD.

Interim monthly limit: AML = 1.5 x AML

Interim weekly limit: AWL = 1.5 x 38 lbs/day = 57 lbs/day

An interim limit at the current discharge of 38 lbs/day monthly average and 57 lbs/day weekly average is established.

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

Part A of this appendix explains the process the 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. Part B demonstrates how the water quality-based effluent limits (WQBELs) in the draft permit were calculated.

A. Reasonable Potential Analysis

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

Mass Balance

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

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

where,

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

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

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

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

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

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

Where:

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

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

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

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

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

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

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

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

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

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

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

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's Technical Support Document for Water Quality-based Toxics Controls (TSD, 1991) recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

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

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

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

and

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

Where,

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

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

$C_e = (RPM)(MRC)$ Equation 10

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone
Once the maximum projected effluent concentration is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones is calculated using the mass balance equations presented previously.

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

Results of Reasonable Potential Calculations
It was determined that both chlorine and ammonia have reasonable potential to cause or contribute to an exceedance of water quality criteria at the edge of the mixing zone. The results of the calculations are presented in Table C-1 of this appendix.

WQBEL Calculations
The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The draft permit includes WQBELs for total residual

chlorine. The following discussion presents the general equations used to calculate the water quality-based effluent limits. The calculations for all WQBELs are summarized in Table ___.

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 ___ and ___). 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 ___ is rearranged to solve for the WLA, becoming:

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

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

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

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

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\sigma)} \qquad \text{Equation 13}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \qquad \text{Equation 14}$$

where,

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

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

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

where,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

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

Derive the maximum daily and average monthly effluent limits

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

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

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

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

σ_n^2 = $\ln(CV^2/n + 1$

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

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

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

Table C-1 details the calculations for water quality-based effluent limits.

Table C-1
Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	Aberdeen, City of (ID0020176)
Design Flow (MGD)	0.82

Dilution Factors (IDAPA 58.01.02 03. b)

		Annual
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	**2.4**
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	**2.4**
Ammonia	**30B3/30Q10** (seasonal)	**2.4**
Human Health - Non-Carcinogen	**30Q5**	**1.0**
Human Health - carcinogen	**Harmonic Mean Flow**	**1.0**

Receiving Water Data

		Notes:	Annual Crit. Flows
Hardness, as mg/L $CaCO_3$		5th % at critical flows	
Temperature, °C	Temperature, °C	95th percentile	20.6
pH, S.U.	pH, S.U.	95th percentile	8.18

Pollutants of Concern			**AMMONIA,** default: cold water, fish early life stages present	**CHLORINE (Total Residual)**
Effluent Data	**Number of Samples in Data Set (n)**		3	9
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		90	500
Dilution Factors	Aquatic Life - Acute	1Q10	2.364	2.364
	Aquatic Life - Chronic	7Q10 or 4B3	-	2.364
	Ammonia	30B3 or 30Q10	2.364	-
Receiving Water Data	**90th Percentile Conc., µg/L - (C_u)**			
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	3,976	19
	Aquatic Life Criteria, µg/L	Chronic	1,251	11
	Human Health Water and Organism, µg/L		--	--
	Human Health, Organism Only, µg/L		--	--
	Metals Criteria Translator, decimal (or default use	Acute	--	0.000
	Conversion Factor)	Chronic	--	0.000
	Carcinogen (Y/N), Human Health Criteria Only		--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.555
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	**99%**	0.215	0.599
Multiplier (TSD p. 57)	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	**99%**	5.6	3.2
Statistically projected critical discharge concentration (C_d)			506.02	1579.49
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	214.07	668.21
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	214.07	668.21
Reasonable Potential to exceed Aquatic Life Criteria			**NO**	**YES**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)				4
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			--	4
LTA Coeff. Var. (CV), decimal (Use CV of data set or default = 0.6)			--	0.600
Permit Limit Coeff. Var. (CV), decimal (Use CV from data set or default = 0.6)			--	0.600
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a-1)$	Acute	--	44.9
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c-1)$	Chronic	--	26.0
Long Term Ave (LTA), ug/L	$WLAc \times \exp(0.5\sigma^2-2.326\sigma)$	Acute	--	14.4
(99th % occurrence prob.)	$WLAa \times \exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic	--	13.7
Limiting LTA, ug/L	used as basis for limits calculation		--	13.7
Applicable Metals Criteria Translator (metals limits as total recoverable)			--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**--**	**21**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**--**	**43**
Average Monthly Limit (AML), mg/L			**--**	**0.021**
Maximum Daily Limit (MDL), mg/L			**--**	**0.043**
Average Monthly Limit (AML), lb/day			**--**	**0.146**
Maximum Daily Limit (MDL), lb/day			**--**	**0.292**

Appendix D –IDEQ Draft 401 Certification

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

June 16, 2015

NPDES Permit Number(s): ID0020427, City of Aberdeen

Receiving Water Body: Hazard Cr. (Aberdeen Drain), Little Hole Draw on American Falls Reservoir

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

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

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

Antidegradation Review

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

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).

- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).

- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

The City of Aberdeen discharges the following pollutants of concern: BOD_5, TSS, *E. coli*, Total Residual Chlorine, pH, Total Phosphorus and Total Ammonia. Effluent limits have been developed for BOD_5, TSS, *E. coli*, Total Chlorine Residual, pH, and Total Phosphorus. No effluent limits are proposed for Total Ammonia.

Receiving Water Body Level of Protection

The City of Aberdeen discharges to Hazard Creek/Little Hole Drawwithin the American Falls Subbasin assessment unit (AU) (17040206SK025_02a). Hazard Creek/Little Hole Drawis undesignated. DEQ presumes undesignated waters in the state will support cold water aquatic life and primary and secondary contact recreation beneficial uses; therefore, undesignated waters are protected for these uses (IDAPA 58.01.02.101.01.a). In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2012 Integrated Report, this AU is not fully supporting one or more of its assessed uses. The aquatic life use is not fully supported. Causes of impairment include Total Phosphorus and Sedimentation/Siltation (Total Suspended Solids). As such, DEQ will provide Tier 1 protection (IDAPA 58.01.02.051.01) for the aquatic life use. The contact recreation beneficial use was assessed in 2003 and was meeting criteria for *E. coli*. For purposes of this review Hazard Cr./Little Hole Draw is considered Tier 2 for recreation. The proposed permit limit is set at the water quality standard (same limit as in the current permit) and assures maintaining this beneficial use at current levels.

Protection and Maintenance of Existing Uses (Tier 1 Protection)

As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters. The numeric and narrative criteria in the WQS are set at levels that ensure protection of designated beneficial uses. The effluent limitations and associated requirements contained in the City of Aberdeen permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL.

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04).

The EPA-approved *American Falls Subbasin Total Maximum Daily Load Plan: Subbasin Assessment and Loading Analysis* (May 2012) establishes wasteload allocations for Total Suspended Solids (TSS) and Total Phosphorus (TP) in Hazard Creek/Little Hole Draw. These wasteload allocations are designed to ensure Hazard Creek/Little Hole Drawand American Falls Reservoir will achieve the water quality necessary to support its existing and designated beneficial uses and comply with applicable numeric and narrative criteria. The effluent limitations and associated requirements contained in the City of Aberdeen permit are set at levels that comply with these wasteload allocations.

In sum, the effluent limitations and associated requirements contained in the City of Aberdeen permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the *American Falls Subbasin TMDL*. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in Hazard Creek/Little Hole Draw in compliance with the Tier 1 provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

High-Quality Waters (Tier 2 Protection)

The Hazard Creek/Little Hole Draw is considered high quality for the recreation beneficial use. As such, the water quality relevant to the recreation beneficial use of the Hazard Creek/Little Hole Draw must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to the recreation beneficial use of the Hazard Creek/Little Hole Draw (IDAPA 58.01.02.052.05). The contact recreation beneficial use was assessed in 2003 and was meeting criteria for E. coli. For purposes of this review, Hazard Cr./Little Hole Draw is considered Tier 2 for recreation. As such, DEQ must ensure that that there is no lowering of water quality with respect to those pollutants relevant to recreational uses. The proposed permit limit for E. coli is set at the water quality standard, and is the same limit that is included in the current permit. Therefore, there will be no lowering of water quality with respect to recreational uses.

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

Compliance Schedule

Pursuant to IDAPA 58.01.02.400.03, DEQ may authorize compliance schedules for water quality–based effluent limits issued in a permit for the first time. City of Aberdeen cannot immediately achieve compliance with the effluent limits for total phosphorus; therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. This compliance schedule provides the permittee a reasonable amount of time to achieve the final effluent limits as specified in the permit. At the same time, the schedule ensures that compliance with the final effluent limits is accomplished as soon as possible.

Table 1. Tasks Required Under the Schedules of Compliance.

Task No.	Completion Date	Task Activity
1	August 1, 2016	Deliverable: Progress Report on Obtaining Funding for Treatment at Facility
2	August 1, 2017	Obtain Funding for Treatment at Facility Deliverable: The permittee must provide the EPA with written notice that the necessary funding has been obtained.
3	August 1, 2018	Complete Environmental Report Deliverable: The permittee must provide the EPA with written notice that the final environmental report is completed. Submission of the environmental report to the EPA is not required.
4	October 1, 2018	Complete Preliminary Design Report Deliverable: The permittee must provide the EPA with written notice that the preliminary design report is completed.
5	April 1 , 2019	Complete Final Design Deliverable: The permittee must provide the EPA with written notice that the final design is complete.
6	July 1, 2019	Complete Bidding Deliverable: The permittee must provide the EPA with written notice that the bidding is complete.
7	July 1, 2020	Construction Substantially Complete Deliverable: The permittee must provide the EPA with written notice that the construction is substantially complete
8	August 1, 2020	Achieve Final Effluent Limitation Deliverable: The permittee must achieve compliance with the final effluent limitations.

Other Conditions

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

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to Lynn Van Every, Pocatello Regional DEQ Water Quality Manager, 208.236.6160 or lynn.vanevery@deq.idaho.gov.

DRAFT

Bruce Olenick
Regional Administrator
Pocatello Regional Office