United States Environmental Protection Agency

Fact Sheet

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

Star Sewer and Water District
Wastewater Treatment Plant
NPDES Permit Number ID0023591

Public Comment Start Date: May 19, 2014
Public Comment Expiration Date: June 18, 2014

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EPA Proposes To Issue this NPDES Permit
The United States (U.S.) Environmental Protection Agency (EPA) proposes to issue a National Pollutant Discharge Elimination System (NPDES) Permit for the facility referenced above. The draft Permit places conditions on the discharge of pollutants from the wastewater treatment plant (WWTP) to waters of the U.S. In order to ensure the protection of water quality and human health, the Permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This fact sheet includes:
- Information on public comment, public hearing, and appeal procedures;
- A listing of proposed effluent limitations and other conditions for the facility;
- A map and description of the discharge location; and,
- Technical material supporting the conditions in the Permit.

State Certification
The EPA requests that the Idaho Department of Environmental Quality (IDEQ) certify the NPDES Permit for this facility under Section 401 of the CWA. Comments regarding the State of Idaho CWA 401 certification should be directed to the IDEQ Boise Regional Office:

IDEQ Boise Regional Office
1445 N. Orchard Street
Boise, ID 83706
Phone: (208) 373-0550
Fax: (208) 373-0287

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 (OWW) 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 the U.S. Code of Federal Regulations (CFR) found at 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 Permit, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at
http://www.epa.gov/r10earth/waterpermits.htm

U.S. EPA
Region 10
1200 Sixth Avenue, Suite 900, OWW-130
Seattle, Washington 98101
Phone: (206) 553-0523

The fact sheet and draft Permit are also available at:

U.S. EPA
Idaho Operations Office
950 W. Bannock Street, Suite 900
Boise, ID 83702
Phone: (208) 378-5746
Fax: (208) 378-5744

IDEQ Boise Regional Office
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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
30Q5	Lowest 30-day average flow expected to occur once every 5 years (used with ammonia criteria)
30Q10	Lowest 30-day average flow expected to occur once every 10 years (used with human health criteria – non-carcinogens)
AML	Average Monthly Limit
AWL	Average Weekly Limit
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical Oxygen Demand, five-day
BMP	Best Management Practices
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CMOM	Capacity, Management, Operation and Maintenance Program
CV	Coefficient of Variation
CWA	Clean Water Act
DF	Dilution Factor
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
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
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDWR	Idaho Department of Water Resources
I/I	Infiltration and Inflow
LA	Load Allocation
LK	Lawrence-Kennedy (Canal)
lbs/day	Pounds per Day
LTA	Long Term Average
MBR	Membrane Bioreactor
MDL	Maximum Daily Limit or Minimum/Method Detection Level
MGD	Million Gallons per Day
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter

ml	Milliliter
ML	Minimum Level
µg/L	Micrograms per Liter
mm	Millimeter
N	Nitrogen
NOAA-NMFS	National Oceanic and Atmospheric Administration – National Marine Fisheries Service (or NOAA-Fisheries)
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and Maintenance
pH	Potential for Hydrogen Ion Concentration
POTW	Publicly Owned Treatment Works
PPB	Parts per Billion
QAP	Quality Assurance Plan
RP	Reasonable Potential
RPA	Reasonable Potential Analysis
SR-HC	Snake River-Hells Canyon TMDL (includes total phosphorus reduction target)
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
SSWD	Star Sewer and Water District
s.u.	Standard Units
TBEL	Technology Based Effluent Limit
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total Suspended Solids
TU_c	Toxic Units, Chronic
UAA	Use Attainability Analysis
US	United States
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
WER	Water Effects Ratio
WET	Whole Effluent Toxicity
WLA	Wasteload Allocation
WQBEL	Water Quality-based Effluent Limit
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

I. Applicant

A. General Information

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

Star Sewer and Water District
Wastewater Treatment Plant
NPDES Permit No. ID002359-1

Physical Address:
11551 West Tempe Lane
Star, Idaho 83669

Mailing Address:
P.O. Box 400
Star, Idaho 83669

Contacts:
John Kirtley, Board President
Star Sewer and Water District
(208) 869-9504

Hank Day, Operations Supervisor
Star Sewer and Water District
(208) 631-8588

B. Permit History

The EPA issued the most recent NPDES Permit for the Star Sewer and Water District (SSWD) on September 30, 1999. The Permit became effective on October 30, 1999 and expired on September 30, 2004. The EPA did not receive an application from the SSWD for NPDES Permit renewal for a publicly owned treatment works (POTW) prior to the expiration date of the Permit. The previous Permit expired and was not granted an administrative extension because a complete application for renewal was not received in a timely manner, as required at 40 CFR 122.21(d). In accordance with EPA Compliance Order CWA-10-2011-0127, issued August 1, 2011, the SSWD must continue to comply with the requirements of the expired Permit until a new Permit is issued. The EPA received an application for Permit issuance on August 2, 2005 and an updated application on July 19, 2013. The EPA used the updated application as the basis for the draft Permit.

II. Facility Information

A. Treatment Plant Description

The SSWD provides sewer and water service for the City of Star and surrounding developed areas in Ada County, Idaho. The SSWD owns, operates, and maintains the Star WWTP. The treatment plant discharges treated wastewater to the Lawrence-Kennedy (LK) Canal, which merges with Mill Slough just before it enters the Boise River approximately seven (7) miles

to the west near the City of Middleton. During the irrigation season, approximately April - October, water from LK canal is applied to agricultural land, with any overflow going to the various agricultural drains that enter Mill Slough or the Boise River. During the non-irrigation season, the LK Canal discharges to South Middleton Drain and/or Watkins Drain and then to Mill Slough.

The WWTP collection system has no combined sewers. The facility currently serves a population of 6300. The average monthly design capacity of the facility is currently 1.85 million gallons per day (mgd) which puts it into the category of "Major" NPDES facilities. The CFR defines a major facility as any NPDES facility or activity classified as such by the Regional Administrator, or in the case of approved state programs, the Regional Administrator in conjunction with the State Director (40 CFR 122.2). Major municipal dischargers include all facilities with design flows of greater than one million gallons per day (mgd) and facilities with EPA/state approved industrial pretreatment programs.

The original WWTP, constructed in the 1960s, consisted of a partially aerated treatment and polishing lagoon system, intermittent sand filters, and chlorine contact basin. The SSWD constructed a membrane bioreactor (MBR) mechanical treatment plant in 2005 and 2006 to operate in parallel with the existing treatment lagoons. The WWTP receives higher flows during the irrigation season. Approximately 20-30% of the influent during the irrigation season is diverted to three (3) lagoon basins for treatment by settling, sand filtration, and chlorination. The remaining 70-80% of the influent is treated through the MBR. During the non-irrigation season, the MBR plant treats the influent.

The MBR treatment process includes anoxic, anaerobic, pre-aeration, and membrane process basins, return activated sludge recycling, solids handling with screw press dewatering equipment, and ultraviolet disinfection. A headworks facility provides both fine and coarse solids screening, as well as grit removal.

Details about the wastewater treatment process, a schematic drawing of the plant, and a map showing the location of the treatment facility and discharge outfall are included in Appendix A of this fact sheet.

B. Compliance History

The EPA reviewed the last five years of discharge monitoring report (DMR) data (2008-2013) and determined that the facility has a good compliance record. The facility met the effluent limitations required by its 1999 NPDES Permit with the following exception listed in the table below. The DMR data are presented in Appendix B.

Table 1. Star Wastewater Treatment Plant Effluent Limit Violations 2008-2013

Star Wastewater Treatment Plant Effluent Limit Violations 2008-2013			
Parameter	**Statistic**	**Units**	**Number of Violations**
pH	Maintain a range of 6.5-9.0 at all times	Standard units (s.u.)	1

The IDEQ conducted an inspection of the facility on September 27, 2013. The inspection encompassed a review of the wastewater treatment process, facility records, and operation and maintenance practices. The inspection report noted that the facility is operating cleanly and efficiently, and it meets the effluent limitations and monitoring requirements of the 1999 NPDES Permit.

III. Receiving Water

As stated above, the receiving water for the WWTP discharge is the LK Canal. The discharge outfall (Outfall 001) is located just downstream of the facility at 43° 41’ 13” latitude and 116° 29’ 51” longitude.

A. Water Quality Standards (WQS)

Overview

Section 301(b)(1)(C) of the CWA requires the development of effluent limitations in NPDES permits that are determined to be necessary in order to meet state and tribal WQS for surface waters. Federal regulations found at 40 CFR 122.4(d) require that the effluent limitations and other conditions included in NPDES permits ensure compliance with the WQS of the receiving water, and waters downstream of the receiving water. A state or tribe’s WQS for surface water are composed of designated use classifications, numeric and/or narrative water quality criteria set at levels to protect those designated uses and an anti-degradation policy with implementation procedures, in order to protect the water quality into the future [40 CFR 131.10, 131.11, and 131.12].

The use classification system designates the beneficial uses of each water body over which the state or tribe has jurisdiction. Uses can be designated for drinking water supply, contact recreation, and aquatic life protection, among others. Narrative provisions are developed and numeric water quality criteria are derived by the state or tribe to ensure that the beneficial uses of each water body are attained and maintained. The anti-degradation policy represents a three-tiered approach to protecting and maintaining current water quality and uses into the future.

Designated Beneficial Uses

The overall objective of CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Section 101(a)(2) of the CWA states that water quality should provide for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water, wherever attainable. This provision is sometimes referred to as the "fishable/swimmable" goal of the CWA. Consistent with this goal, states are required to designate all waters of the U.S. within the state with fishable/swimmable use designations unless the state can meet the requirements found at 40 CFR 131.10 to remove the fishable/swimmable uses through a use attainability analysis (UAA).

The LK Canal is part of the Lower Boise Subbasin - Hydrologic Unit Code (HUC) 17050114. At Outfall 001, the LK Canal has not been designated for any specific uses in the State of Idaho WQS, found in the State of Idaho Administrative Procedures Act (IDAPA) at IDAPA 58.01.02.110 through 160. The Idaho WQS state that all such “undesignated waterways” are to be protected for the beneficial uses of cold water aquatic life and primary contact recreation (IDAPA 58.01.02.101.01) in accordance with the goals of the CWA.

In the draft CWA Section 401 certification from IDEQ (See Appendix H of this fact sheet), IDEQ identifies the LK canal as a man-made waterway, which delivers water from the Boise River to irrigate agricultural land to the west of the City of Star. The draft 401 certification protects the LK-canal for agricultural water supply only, stating that "Man-made waterways, for which uses are not designated in IDAPA 58.01.02, sections 110 – 160, are to be protected for the uses for which they were developed; in this case, agricultural water supply (IDAPA 58.01.101.02)."

However; because IDEQ is required to designate all waters of the U.S. within the State with fishable/swimmable uses unless a UAA is completed and approved by EPA, the EPA is establishing limits in this Permit that are more protective than required by the draft 401 certification. Therefore, the Permit conditions protect the LK canal for cold water aquatic life and primary contact recreation.

In addition, the Idaho WQS require all waters of the State of Idaho to be protected for industrial and agricultural water supply, wildlife habitats and aesthetics (IDAPA 58.01.02.100.03.b and c, 100.04 and 100.05). The WQS that apply to the receiving water of the facility's discharge come from the designated uses of the water body.

The canal meets the Boise River at Water Body Unit SW-5, Boise River between River Mile 50 and Indian Creek, which is a segment of the river listed as impaired for a number of water quality parameters by the State of Idaho. Because the Boise River is a downstream waterbody that is potentially impacted by the quality of water in the LK Canal, the EPA also identified the beneficial uses of the Boise River at Water Body Unit SW-5. The CWA requires the attainment and maintenance of downstream WQS at 40 CFR 131.10(b). The State of Idaho WQS protect this segment of the Boise River for cold water aquatic life, primary contact recreation, salmonid spawning, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics. The salmonid spawning designation for this segment of the Boise River relates to a site specific temperature criterion, during part of the year, which protects salmonid spawning.

Surface Water Quality Criteria
The criteria applicable to the LK Canal are found in the following sections of the State of Idaho WQS:

- 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 also IDAPA 58.01.02.252.02)

Also, the EPA published a national recommendation for deriving a fish tissue-based methylmercury criterion for the protection of human health use designations for Idaho surface waters (in place of previous water column-based mercury criteria for the protection of aquatic life) in January 2001. In 2005, the State of Idaho adopted the EPA's recommended methylmercury fish-tissue criterion of 0.3 milligrams per kilogram (mg/kg) for the protection of human health and decided to remove the older acute (2.1 µg/L) and chronic (0.012 µg/L) mercury water column criteria for the protection of aquatic life, using the methylmercury fish tissue criterion for aquatic life as well as human health protection.

On December 12, 2008, the EPA disapproved Idaho's removal of the mercury acute and chronic freshwater aquatic life criteria from the WQS. Therefore, the numeric aquatic life criteria for mercury applicable to aquatic life use designations in Idaho are the previously adopted water column acute and chronic criteria which the EPA approved in 1997.

As discussed above on page 10, to date, no UAA for use removal has been developed for the LK Canal under the CWA. Therefore, the draft Permit conditions protect for aquatic life and recreation uses. As such, both the fish tissue-based methylmercury criterion (for the protection of human health) and the water column-based mercury criteria (for the protection of aquatic life) apply to the LK Canal.

In addition, the site specific water quality criteria applicable to the Boise River Segment SW-5 can be found at IDAPA 58.01.02.278.01 and 278.04:

- Lower Boise River Subbasin, HUC 17050114 Subsection 140.12,
    - Boise River, SW-1 and SW-5 – Salmonid Spawning and Dissolved Oxygen (requires a DO concentration of six (6) milligrams per liter (mg/L) or 75% saturation, whichever is greater, during the salmonid spawning period, from Veterans State Park to the mouth of the river)
    - Boise River, SW-5 and SW-11a – Site-Specific Criterion for Water Temperature (requires a maximum weekly maximum temperature of thirteen degrees Celsius (13°C) to protect brown trout, mountain whitefish and rainbow trout spawning and incubation; applies November 1 – May 30)

Antidegradation

The IDEQ has completed an antidegradation review which is included in the State's draft CWA 401 water quality certification for this permit. See Appendix H. Comments on the 401 certification, including the antidegradation review, can be submitted to the IDEQ as stated above on page 1 of this fact sheet (see State Certification).

B. Receiving Water Low Flow Conditions

The EPA *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD; EPA, 1991) and the State of Idaho WQS recommend the receiving water flow conditions for use in calculating water quality-based effluent limits (WQBELs) for point source dischargers 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 7 day average flow rate expected to occur once every 10 years for protection at the level of the chronic criterion, the 7Q10, and the lowest one (1) day average flow rate expected to occur once every 10 years for protection at the level of the acute criterion, the 1Q10. The EPA uses a biologically-based flow rate designed to protect the receiving water for ammonia at an excursion frequency (violations of the water quality criteria derived for protection of the water body and aquatic life from ammonia) of no more than once every three (3) years for a 30 day average flow, the 30B3. This evaluation criterion aligns with basing the numeric ammonia criteria on the 30-day average concentration not to be exceeded more than once every 3 years. The lowest 30-day average flow rate expected to occur once every 10 years may be used for ammonia in cases where seasonal variation in flow is used, the 30Q10 flow. The State of Idaho WQS recommend the lowest 30-day average flow rate expected to occur once every five (5) years, the 30Q5, for WQBELs intended to protect human health from non-carcinogens, and the harmonic mean flow rate for protecting human health from carcinogens. The low flow conditions of a receiving water body are used to assess the need for and develop WQBELs (see Appendix D for additional information on flows).

The EPA reviewed the Idaho Department of Water Resources (IDWR) historical water flow data for the Little Pioneer Canal (upstream of the LK Canal) and the South Middleton Drain (downstream of the canal). http://maps.idwr.idaho.gov/qWRAccounting/WRA_Select.aspx

EPA graphed the flow of both the Little Pioneer Canal and the South Middleton Drain between 1986 and 2013 and found that there were many periods of zero (0) flow recorded in the datasets. In discussion with the Permittee about this dataset, the Permittee requested an explanation of the dataset from the Drainage District Number 3 Watermaster, who submits the data to IDWR. The letter from the Drainage District Number 3 Watermaster to the Star WWTP is included below. The letter states that while “the drains do flow year round, the office does not track flow during the non-irrigation season”. Based on this information, the EPA used the lowest non-zero flow in the South Middleton Drain dataset as the starting point for calculating the 1Q10 acute flow and the lowest week of non-zero flow in the South Middleton Drain dataset as the starting point for calculating the 7Q10 chronic flow.

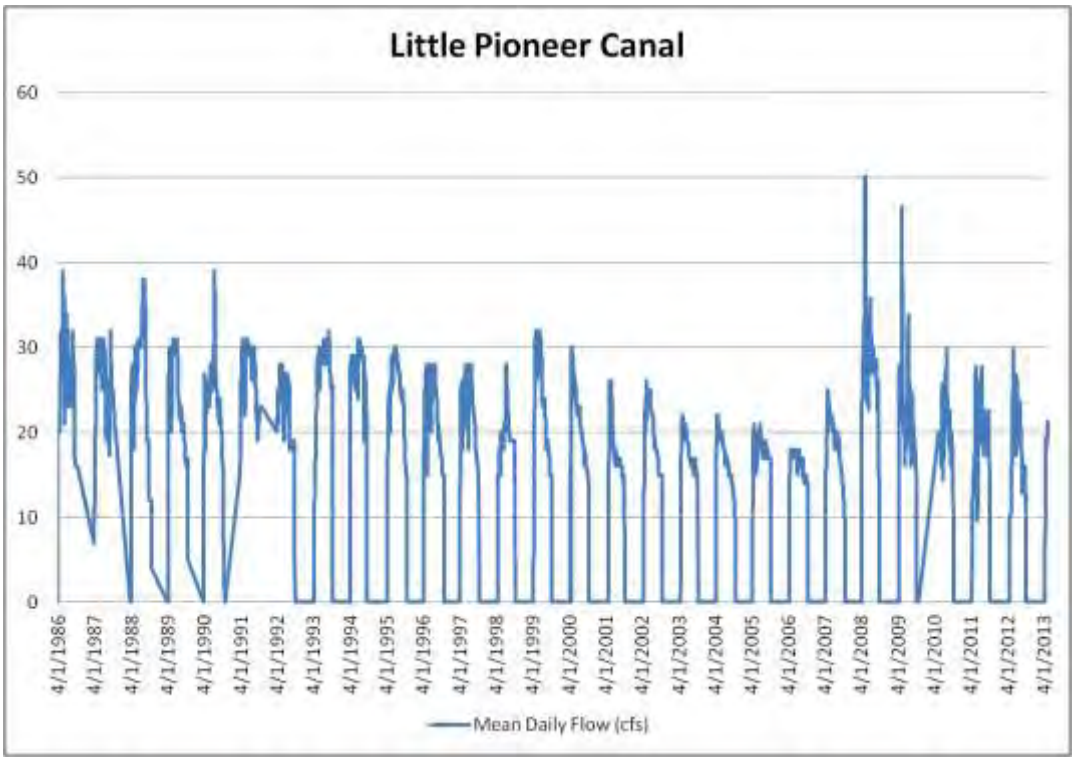

Figure 1. Mean Daily Flow of the Little Pioneer Canal 1986-2013.

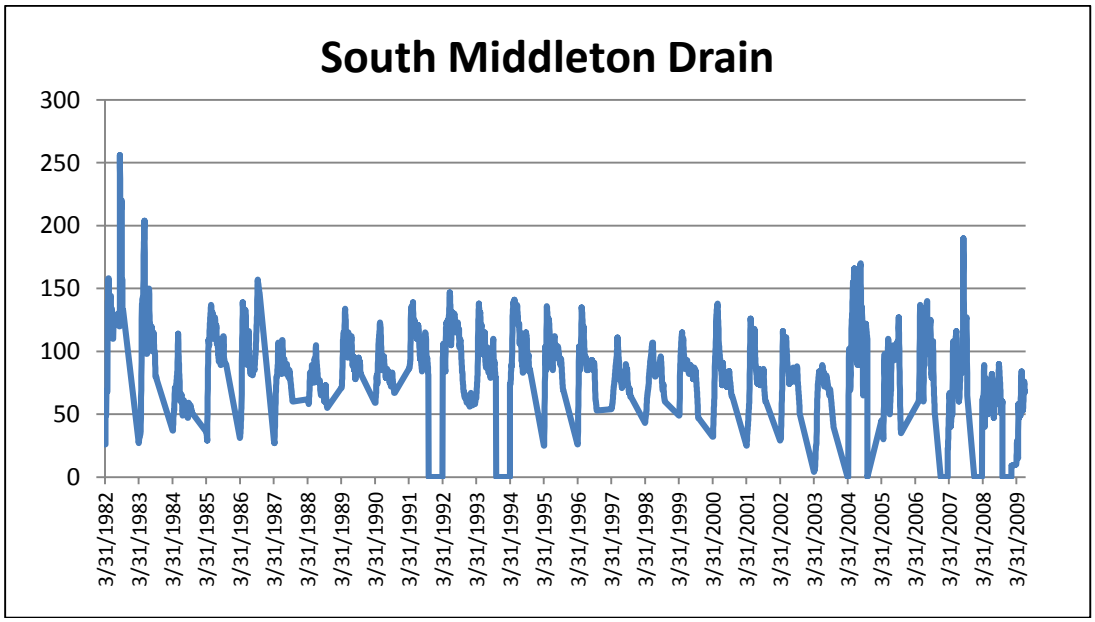

Figure 2. Mean Daily Flow of the South Middleton Drain from 1986-2013.

STATE OF IDAHO
WATER DISTRICT No. 63
(BOISE RIVER)

REX R. BARRIE, WATERMASTER
P.O. BOX 767
STAR, IDAHO 83669-0767
(208) 908-5480

Mr. Hank Day
Star Sewer and Water Company
Star, Idaho 83669

Dear Mr. Day,

Regarding your question about measurement of the drains in Water District #63.

Historically the Watermaster only tracks the return flows to the Boise River during the irrigation season.
This is done to record reach gains in different sections of the river to provide accurate data for the State's water accounting program related to water rights that are administered during the irrigation season.

These drains do flow water year round but my office does not track flow during the non-irrigation season.

Please contact me if there are any questions regarding this matter.

Sincerely,

Rex R. Barrie
Boise River Watermaster

Figure 3. Letter from Boise River Watermaster to Star Sewer and Water District Regarding IDWR Return Flow Tracking

The EPA reviewed the letter from the Drainage District #3 Watermaster stating that there is always flow in the drains, but the District does not measure flow in the non-irrigation season, and determined that the lowest non-zero flow in the South Middleton Drain dataset was 4 cfs, as measured on April 1, 2007. Since the South Middleton Drain flow data was measured downstream from the Star WWTP, the EPA subtracted the design flow of the WWTP (1.85 MGD corresponding to 2.9 cfs) from the 4 cfs as measured in South Middleton Drain and used the resulting 1.1 cfs as the 1Q10 acute low flow in the limit calculations proposed in the draft permit. This corresponds to the 1 cfs flow used for the 1Q10 in the low flow (non-irrigation) season in the last Permit.

In order to calculate the 7Q10 and 1Q10 during the high flow (irrigation) season, the EPA used the South Middleton Drain dataset and calculated flows for the LK Canal using recommended equations from the 1991 EPA *Technical Support Document for Water-quality*

Based Toxics Control (TSD) and subtracting the design flow of the WWTP. The results of the receiving water flow analysis are summarized in the table below.

Table 2. Seasonal Flow Rates in the LK Canal Downstream from the Star WWTP

Seasonal **Flow Rates in the** Lawrence-Kennedy Canal				
Season	**1Q10 (CFS)**	**7Q10 (CFS)**	**30B3/30Q5 (CFS)**	**Harmonic Mean**
April – October (irrigation season)	25	34	37	70
November – March (non-irrigation season)	1.1	N/A	N/A	N/A

Although the EPA ran this seasonal flow rate analysis, due to insufficient non-irrigation season receiving water flow data, the EPA cannot justify the use of seasonal flows to calculate seasonal effluent limits. Therefore, the EPA determined that the use of the critical 1Q10 low flow was the basis for calculating annual effluent limits, because insufficient data prompt conservative permit assumptions.

C. Receiving Water Quality Data Used in Calculations

During the development of the draft Permit, the EPA requested the Permittee to collect and analyze a few samples of LK Canal water for hardness, pH, temperature, nitrogen and phosphorus. The LK canal pH (3 samples) and temperature (2 samples) data collected were used in calculating the ammonia water quality criteria applicable to the LK Canal using the State of Idaho's WQS equation for ammonia, found at IDAPA 58.01.02.250.01(d). The hardness (3 samples) data collected were used in calculating some of the hardness-dependent metals criteria applicable to the LK Canal using Idaho's WQS metals equations. Once the criteria were calculated, the EPA evaluated the effluent data against the calculated criteria and determined if the facility has the reasonable potential (RP) to cause or contribute to an excursion of those water quality criteria. That determination forms the basis for any new effluent limits or monitoring requirements proposed the draft Permit. If more than one sample was taken, the EPA used the warmest value for temperature (in degrees Celcius), the lowest value for hardness (in milligrams per liter [mg/L] calcium carbonate) and the average value for pH (in standard units or s.u.) in the calculations.

Table 3. Water Quality Data Collected on the LK Canal, May-June 2013

Data collected on the LK Canal; May-June 2013			
Upstream Point		**Downstream Point**	
Hardness	47.40 mg/L $CaCo_3$	Hardness	49.90 mg/L $CaCo_3$
	41.80 mg/L $CaCo_3$		**45.40 mg/L $CaCo_3$**
	62.40 mg/L $CaCo_3$		61.40 mg/L $CaCo_3$
Temperature	**19.6° C**	Temperature	**19.7°** C
pH (average value)	6.93 s.u.	pH	6.98 s.u.

D. Water Quality Limited Waters

Any waterbody for which the water quality does not, and/or is not expected to, meet the applicable WQS is defined as a "water quality limited segment." Section 303(d) of the CWA requires states to develop a Total Maximum Daily Load (TMDL) pollutant 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 of a water body is the amount of loading of a pollutant that the water body can absorb 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 all the point and non-point pollutant sources in the area, taking into account natural background levels and a margin of safety. Allocations for non-point sources are known as "load allocations" (LAs) and typically involve the implementation of best management practices (BMPs) for pollution source control. 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 the applicable TMDL WLAs.

The proposed receiving water is a tributary to a water-quality limited segment of the Lower Boise River (SW-5). Segment SW-5 of the Lower Boise River is listed by the IDEQ as being impaired for sediment, bacteria, temperature, and nutrients in the December 18, 1998 *Lower Boise River TMDL, Subbasin Assessment, Total Maximum Daily Loads*. http://www.The EPA.gov/waters/tmdldocs/boise_river_lower_noapps.pdf. The LK Canal is not listed as impaired. However, in assessing RP and developing water-quality based effluent limitations (WQBELs) in NPDES permits, the EPA must protect the designated uses and WQS of downstream waters, including the discharge of pollutants at a level which will cause, have the RP to cause, or contribute to an excursion above the state WQS. The LK Canal is not afforded much dilution and the discharge point of the WWTP is only 7 miles from the confluence of the canal with the Lower Boise River. Therefore, in developing this draft Permit, the EPA considered the allocations for sediment, bacteria, temperature

In January 2000, the EPA approved the IDEQ-developed TMDL for sediment and bacteria for the Lower Boise River. IDEQ does not currently have a schedule for submittal of a TMDL for temperature for the Lower Boise River watershed, but plans to submit a draft TMDL for phosphorus to the EPA for review in the spring of 2014.

Sediment

The Lower Boise River TMDL for sediment and bacteria provided the Star WWTP with WLAs for total suspended solids (TSS) for a discharge to the LK Canal (See Table 15 in the *IDEQ Lower Boise River TMDL, Subbasin Assessment, Total Maximum Daily Loads, pg. 62* or the Revised Table 15 in the *IDEQ Sediment and Bacteria Allocations Addendum to the Lower Boise River TMDL, April 2008, pg. 62* *http://www.epa.gov/waters/tmdldocs/L%20Boise%20Sed%20Bact%20TMDL%20addendum.pdf).*

The TSS WLAs in the TMDL for the Star WWTP are 70 milligrams per liter (mg/L) as the monthly average concentration; and 193 pounds per day (lbs/day) monthly mass allocation;

with 290 lbs/day as the weekly mass allocation. These approved WLAs for mass loading from the 2008 IDEQ Addendum to the Lower Boise River TMDL were included in the draft Permit. The concentration limits in the draft permit are consistent with the national secondary treatment regulations found at 40 CFR 133 and are more stringent than the TMDL WLA.

Bacteria
The Lower Boise River TMDL for sediment and bacteria included a WLA for the Star WWTP for bacteria based on fecal coliform concentrations. However, the TMDL stated that if the numeric criteria to protect water quality from bacteria were revised by the State of Idaho to require *E. coli* limits instead of fecal coliform, then "…compliance with the load allocations in this TMDL could be demonstrated using *E. coli* samples, rather than fecal coliform," and that "…if *E. coli* are used as the new Idaho criteria for contact recreation when the permits are re-issued, the new *E. coli* criteria should be incorporated into the permits in place of fecal coliform requirements". (See the *Lower Boise River TMDL, Subbasin Assessment, Total Maximum Daily Load,* IDEQ, September 1999, page 74)

Therefore, the more current Idaho surface water quality criteria for contact recreation was used in determining effluent limitations for *E. coli* bacteria for the Star WWTP (IDAPA 58.01.02.251.01). The WQS in IDAPA 58.01.02.251.01 state that waters designated for recreation are not to contain *E. coli* bacteria in concentrations exceeding a geometric mean of one hundred twenty-six (126) *E. coli* organisms per 100 milliliters (ml) based on a minimum of 5 samples taken every 3 to 7 days over a 30-day period. The WQS also state that for waters designated as primary contact recreation, *E coli* bacteria concentrations must not exceed a single sample maximum of 406 *E. coli* organisms per 100 ml.

Temperature
According to the 1998 *Lower Boise River TMDL***,** two segments of the Boise River have been listed for temperature impairments. The listed first segment runs between Star and Notus, and the second segment runs between Notus and the Snake River. The cold water biota temperature criteria apply to the Boise River, to protect the cold water biota use, between Lucky Peak Dam and the Snake River, including the two impaired segments downstream of Star. Cold water biota criteria are a daily maximum of 22°C and a maximum daily average of 19°C. Salmonid spawning criteria apply to the Boise River, to protect the salmonid spawning use, between the Diversion Dam and Caldwell, including part of the segment from Star to Notus that is impaired for temperature. There is a site specific spawning temperature criterion (maximum weekly maximum temperature) that applies to the Boise River downstream of Star (Segment SW-5) between November 1 and May 30 for brown trout, mountain whitefish and rainbow trout. The spawning criterion for these species is set at a weekly maximum of 13°C [IDAPA 58.01.02.278.04].

Temperature limits were not developed for the draft Permit, but there is a new requirement for continuous temperature monitoring of the effluent and the receiving water. This data will inform IDEQ's upcoming TMDL for temperature for the Lower Boise River Watershed and to determine if the facility has the RP to cause or contribute to an exceedance of the State of Idaho's temperature criteria applicable to the canal.

Nutrients/Phosphorus

Due to the need to manage total phosphorus (TP) concentrations and protect human health and the environment in the Lower Boise River prior to the development and approval of the Lower Boise TMDL for TP, the EPA has determined that the TP WLA concentration of 70 µg/L (micrograms per liter, or parts per billion [ppb]) from the Snake River-Hells Canyon (SR-HC) TMDL is the appropriate value to use to interpret Idaho's narrative criterion for nutrients for the purposes of determining RP and, if necessary, calculating effluent limits for TP. (See the June 2004 *IDEQ Snake River Hells-Canyon Total Maximum Daily Load (TMDL) Submitted to the EPA in July 2003 and revised in June 2004* water quality target for nutrients.)
http://www.epa.gov/waters/tmdldocs/Snake%20River_Hells%20Canyon_9_04.pdf

The EPA has been translating the water quality target for nutrients developed for the SR-HC TMDL into NPDES permit limits for dischargers to the Lower Boise River, resulting in 70 µg/L TP as the average monthly limit (AML) from May 1st to September 30th (0.07 mg/L TP in the TMDL).

The EPA believes that this concentration is reasonable because the concentration is below the EPA's effects based criterion of 0.1 mg/L from the Gold Book - *Quality Criteria for Water 1986* and falls within the range of acceptable concentrations for the control of periphyton cited in the EPA's *Nutrient Criteria Technical Guidance Manual, Rivers and Streams*. The IDEQ analysis performed for the SR-HC TMDL demonstrated that beneficial uses in the Snake River could be restored if the concentration of phosphorus at the mouth of the Boise River was less than or equal to 70 µg/L. Therefore, the EPA believes that 70 µg/L of phosphorus will be protective of both the Boise River and the Snake River between May and September.

It is important to note that the 70µg/L TP limit for the Star WWTP must be met at the point of discharge into the LK Canal, without any allowance for dilution. The reason for this "end of pipe" limit is because the background concentration of TP in the Boise River upstream from the Star WWTP is currently greater than 70µg/L. For additional information on the proposed effluent limit for TP, see Appendix G of this fact sheet.

IV. Effluent Limitations

A. Background on Technology and Water Quality-Based Effluent Limitations

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977. As stated earlier, the EPA's secondary treatment regulations are found at 40 CFR 133. These technology-based effluent limits (TBELs) are the minimum level of effluent quality attainable by secondary treatment in terms of 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH (potential for hydrogen ion concentration).

In addition to TBELs, the CWA requires the EPA to include water quality-based effluent limits (WQBELs) for any pollutant that may cause or contribute to an exceedance of Idaho's WQS. A WQBEL developed for an NPDES permit is designed to ensure that the WQS of a waterbody are met by the point source discharger at the end of the pipe, or at the edge of the authorized mixing zone. The CWA requires that the permit effluent limits for any particular pollutant must be the more stringent limit of either the TBEL or the WQBEL. The bases for the proposed effluent limits in this draft Permit are provided in the Appendices.

B. Reasonable Potential Analysis (RPA) Performed on the Pollutants of Concern

In the course of developing the draft Permit for the Star WWTP, the EPA reviewed information from the following sources:

- 1999 NPDES permit and fact sheet;
- Updated July 2013 NPDES Application Form 2A, including the Part D Priority Pollutant Analysis;
- Five years of DMR data from 2008-2013;
- Supplemental data provided by the facility on MBR (2006-2013) and lagoon (2013) performance; and,
- Supplemental data provided by the facility on receiving water characteristics (2013)

From this information, the following pollutants of concern were identified as needing limits due to the secondary treatment regulations found at 40 CFR 133, regulations in the Idaho WQS, or an EPA-approved TMDL WLA. The parameters below require, at a minimum, TBELs based on the secondary treatment regulations.

- BOD_5 (5-day biological oxygen demand)
- TSS (total suspended solids)
- *E. coli*
- pH

The following pollutants of concern were identified and analyzed for the RP to cause or contribute to an excursion of the State of Idaho WQS:

- Priority pollutants in the facility's effluent analyzed with detectable results for Part D of the NPDES Application Form 2A:
  - Chloroform
  - Zinc
  - Copper

- Pollutants known to be present in the facility's effluent at detectable levels per the DMRs and facility supplemental data.
  - Total Residual Chlorine (TRC)
  - Ammonia
  - Temperature
  - TP

Priority Pollutant Scan – NPDES Application Part D

The Star WWTP agreed to update their NPDES application, at the EPA's request, because many changes had taken place at the facility since the original application for Permit re-issuance was submitted in 2005. The Star WWTP ran one (1) set of the suite of priority pollutants. The lab results were reported by Analytical Laboratories, Inc. in Boise, Idaho, with a sample collection date of May 14, 2013. Typically, a facility would submit three (3) sets of results with the application, but this was the first time the Star WWTP met the requirements for Part D of the application. The parameters with detectable levels present in the facility's effluent are summarized in the table below.

Table 4. Results of Star WWTP Effluent Priority Pollutant Scan

Parameter	Results
Chloroform	2.4 µg/L
Copper	<10 µg/L
Zinc	20 µg/L

The EPA determined the results did not provide enough information to find RP or to calculate effluent limitations for these parameters, but they do inform the effluent monitoring needs for this permit cycle. Therefore, the Star WWTP must monitor for metals in the effluent semi-annually, providing for ten (10) sample results that may be used in the calculations for the next permit. See Appendix A of the draft Permit for a table of laboratory detection minimum levels (MLs). The Permittee must use a laboratory that can analyze the effluent and report results comparable to the recommended MLs.

For comparison purposes, the EPA calculated the hardness dependent metals criteria applicable to the LK Canal, using the minimal data that was submitted. Results are presented in the table below. This information was not used to derive any effluent limitations in this draft Permit.

Table 5. Hardness-Dependent Metals Criteria Calculations

Idaho - Numeric Criteria for Toxic Substances (IDAPA 50.01.02.210)

Sources IDAPA 58.01.02
EPA National Recommended Water Quality Criteria

		Notes:
Receiving water Hardness, mg/L as	42	
Receiving pH	6.9	
Receiving water TSS, mg/L (leave blank if unknown)		
If TSS is annual data, enter 'A'; if from critical period, enter 'S'; If no TSS, leave blank		
Criteria below calculated using:		
Acute Hardness, mg/L:	42.0	
Chronic Hardness, mg/L:	42.0	
Mixed Hardness:		
Apply 'Mixed Hardness' (Y/N)?:	N	
Effluent Hardness, mg/L:		5th percentile DMR Data
Acute Mixed Hardness, mg/L:		If mixing zone authorized.
Chronic Mixed Hardness, mg/L:		If mixing zone authorized.

Pollutant	Select Pollutant of Concern or enter µg/L	Idaho (Number)	CAS No.	NPDES App. Ref. No.	Criteria variable dependent	Acute Hardness, mg/L	Chronic Hardness, mg/L	WER Acute = AT (sample)/ AT(lab)	WER Chronic = CT (sample)/ CT(lab)	Priority Pollutant?	Carcinogen?	Aquatic Life Criteria, µg/L Acute	Aquatic Life Criteria, µg/L Chronic	Human Health Criteria Water and Organisms, µg/L	Human Health Criteria Organisms only, µg/L	Metals Translators Acute	Metals Translators Chronic
CADMIUM		4	7440439	4M	Hardness	42.0	42.0	1	1	Y	N	0.6	0.3	Narrative	Narrative	0.994	0.909
CHROMIUM(TRI)		5	16065831	5M	Hardness	42.0	42.0	1	1	N	N	280	36	Narrative	Narrative	0.316	0.860
COPPER		6	744058	6M	Hardness	42.0	42.0	1	1	Y	N	7.5	5.4			0.960	0.960
LEAD		7	7439921	7M	Hardness	42.0	42.0	1	1	Y	N	21.4	0.8	Narrative	Narrative	0.791	0.791
NICKEL		9	7440020	9M	Hardness	42.0	42.0	1	1	Y	N	225	25.0	610		0.998	0.997
PENTACHLOROPHENOL		53	87865	9A	pH	6.90				Y	Y	0	0	0.27	3.00		
SILVER		11	7740224	11M	Hardness	42.0	42.0	1	1	Y	N	0.8				0.85	na
ZINC		13	7440666	13M	Hardness	42.0	42.0	1	1	Y	N	56	57	7400.00	26000.00	0.978	0.986

DMR and Facility Supplemental Data

In addition to the July 2013 updated NPDES permit application, the EPA reviewed the facility- specific DMR data entered into the EPA's Integrated Compliance Information System (ICIS) database and the supplemental data provided by the Star WWTP on MBR performance, lagoon-only performance, and receiving water quality. See Appendix B for the DMR data. The information used in performing RP analyses on chlorine, ammonia, temperature and pH came from the DMRs and/or facility supplemental data sets. See the Appendices for more details on low flows and dilution, bases for limits, RPAs, and WQBEL calculations.

TRC

Sodium hypochlorite is a chemical containing chlorine that is used at the Star WWTP. Chlorine is a common disinfectant, and part of the wastewater treatment process in order to remove pathogens before discharging effluent to surface waters. There is no mechanism for dechlorination before discharge that is currently installed at the Star WWTP.

Based on the DMR information provided by the facility in the last five (5) years from 2008-2013, the 95 percentile of the maximum TRC in the effluent was 4.3 mg/L. Out of 62 data points, the range of measurements of TRC in the effluent was 0.6 mg/L to 5.1 mg/L. The Idaho water quality criteria for chlorine, a toxic pollutant to aquatic life, are 19 µg/L acute and 11 µg/L chronic. The EPA ran the RP calculation using the 95th percentile value of 4300 µg/L (4.3 mg/L) and the dilution potential of the LK Canal at 1.1 for aquatic life related parameters.

The EPA determined that the Permittee has the RP to exceed the Idaho WQS for chlorine. Therefore, there are proposed TRC effluent limitations in the draft permit. For more information on the proposed TRC limitations, see Section IV.C of this fact sheet and Part I.B of the draft Permit.

Ammonia
The DMR information provided by the facility in the last five (5) years from 2008-2013 was reviewed along with the facility's submitted supplemental data on effluent monitoring. More ammonia data points were included in the supplemental data provided by the facility, so the EPA ran the RP analysis for ammonia using that dataset (90 points instead of the 62 in the DMR dataset). Out of 90 data points, the range of measurements of ammonia in the effluent was 0.04 mg/L to 14.9 mg/L. The 95th percentile of the maximum ammonia in the effluent was 5.4 mg/L. The EPA ran the RP calculation using the maximum value of ammonia measured (14.9 mg/L) and the dilution potential of the LK canal at 1.1 for aquatic life related parameters in the low flow season (non-irrigation months) and 2.3 for aquatic life related parameters in the high flow season (irrigation/summer months).

The EPA determined that the Permittee has the RP to exceed the Idaho WQS for ammonia during both seasons. The water quality criteria were calculated using the pH and hardness measured in the LK canal. The applicable criteria are 26.15 mg/L acute and 4.41 mg/L chronic. See the table below for the calculations. This, in addition to the earlier discussion on the inadequate flow data on the canal in the non-irrigation season, led the EPA to propose annual ammonia effluent limitations in the draft permit. For more information on the ammonia criteria and effluent limitations, see Sections IV.C and IV.D in this fact sheet, as well as Part I.B of the draft Permit.

Table 6. Ammonia Criteria Calculation Based on Receiving Water Temperature and pH

Freshwater Un-ionized Ammonia Criteria Calculation
Annual Basis
Based on IDAPA 58.01.02

INPUT	
1. Receiving Water Temperature (deg C):	19.6
2. Receiving Water pH:	6.90
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
1. Unionized ammonia NH3 criteria (mg NH3/L)	
Acute:	0.097
Chronic:	0.006
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**26.15**
Chronic Criterion (CCC)	**4.41**

Acute Criteria Equation:

$$\frac{0.275}{1+10^{7.204-\mathrm{pH}}}+\frac{39}{1+10^{\mathrm{pH}-7.204}}$$

Chronic Criteria Equation

$$\left(\frac{0.0577}{1+10^{7.688-\mathrm{pH}}}+\frac{2.487}{1+10^{\mathrm{pH}-7.688}}\right)\times \mathrm{MIN}\left(2.85, 1.45\times 10^{0.028\times(25-\mathrm{T})}\right)$$

Temperature
Based on the limited DMR information provided by the facility in the last 5 years from 2008-2013, the 95th percentile for the maximum temperature of the effluent was 22.3°C. Out of 63 data points, the range of measurements for maximum effluent temperature was 7.6 to 22.6°C. The Idaho narrative water quality criteria for temperature for aquatic life use designations is 22°C or less with a maximum daily average of no greater than 19°C.

However, there is currently no continuous temperature data which are needed to make a determination of the facility's RP to exceed Idaho's temperature criteria. Therefore, the EPA proposes that the Star WWTP continuously monitor receiving water and effluent temperature during this permit cycle. Monitoring for temperature in the receiving water and effluent is required to better characterize the seasonal variation of the temperature of the receiving water and the effluent. This information is needed to better evaluate during which times of the year the effluent may contribute to exceedances of the WQS for temperature. For more information on temperature monitoring, see Section V (page 35).

Total Phosphorus (TP)
The supplemental data provided by the facility and evaluated by the EPA shows that the average TP concentration measured in the effluent from 2006-2013 was 2.26 mg/L(or 2260 µg/L) with a minimum concentration during that time period of 0.33 mg/L (330 µg/L) and a maximum concentration of 6.02 mg/L (6020 µg/L).

See Appendix G for the detailed information on the RP for TP in the discharge to necessitate the proposed effluent limit in the draft Permit.

C. Proposed Effluent Limitations

The following table presents the proposed effluent limits in the draft permit for BOD_5, TSS, pH, *E. coli*, TRC, total ammonia as nitrogen (N), and TP.

Table 7. Proposed Effluent Limits for the Star Wastewater Treatment Plant

Proposed Effluent Limits for the Star Wastewater Treatment Plant					
Parameter	**Units**	**Effluent Limits**			**Basis for Effluent Limits**
		Average Monthly Limit (AML)	**Average Weekly Limit (AWL)**	**Maximum Daily Limit (MDL)**	
Five-Day Biochemical Oxygen Demand (BOD_5)[1]	mg/L	30	45	--	TBEL
	lbs/day	463	694	--	
BOD_5 Removal	Percent Removal	≥85%			
Total Suspended Solids (TSS)[2]	mg/L	30	45	--	TBEL/IDEQ draft 401 certification
	lbs/day	463	694	--	
TSS Removal	Percent Removal	≥85%	--	--	
pH[3]	Standard units (s.u.)	Not less than 6.5 or greater than 9.0 s.u. at all times			WQS
E. coli[4]	#/100 ml	126 (geometric mean)	--	406 (single sample maximum)	WQS
Total Ammonia (as N) Interim Limits[5]	mg/L	5.4	--	24	TBEL-95th percentile of effluent data
	lbs/day	83	--	370	
Total Ammonia (as N) Final Limits[5]	mg/L	4.1	--	18.2	WQBEL
	lbs/day	63	--	281	
Total Residual Chlorine (TRC) Interim Limits[6]	mg/L	0.5	0.75	--	TBEL
	lbs/day	7.7	11.6	--	
Total Residual Chlorine (TRC) Final Limits[6]	µg/L	10	--	20	WQBEL
	lbs/day	0.15	--	0.32	
Total Phosphorus (TP) Interim Seasonal Limits[7]	mg/L	4.5	9	--	TBEL-95th percentile of effluent data
	lbs/day	69	140	--	
Total Phosphorus (TP) Final Seasonal Limits[7] May 1 - September 30	µg/L	70	141	--	Snake River-Hells Canyon TMDL
	lbs/day	1.1	2.2	--	

Table Notes:

[1] BOD limits calculated in accordance with secondary treatment standards and regulatory requirements found at 40 CFR 133.102.

[2] TSS limits calculated in accordance with secondary treatment standards and regulatory requirements found at 40 CFR 133.102 and from the April 23, 2014 draft IDEQ CWA Section 401 certification of the draft Permit. The draft 401 certification includes the April 7, 2014 letter from IDEQ to Justin Walker, Keller Associates District Engineer, stating that the IDEQ is revising Table 15 of the 2008 *Sediment and Bacteria Allocations Addendum to the Lower Boise River TMDL* to allow the Star WWTP an increased mass-based AML and AWL matching the increased design flow of the facility.

[3] pH limits come directly from the State of Idaho WQS [IDAPA 58.01.02.250.01(a)].

[4] E. coli limits come directly from the State of Idaho WQS [IDAPA 58.01.02.251].

[5] Ammonia limits calculated in accordance with the EPA's 1991 TSD for WQBELs.

Interim AML for ammonia set equal to the 95th percentile of the facility's data on ammonia concentrations and MBR plant performance from 2006-2013. The interim MDL for ammonia was calculated using Table 5-3 in the 1991 EPA TSD; with a cv=0.6 and n=4. The mass based interim limit is calculated from the concentration limits using the design flow of the facility, consistent with 40 CFR 122.45(b)(1), and the interim limits must be met through the time period of the compliance schedule.

Final ammonia limits are calculated in accordance with EPA's 1991 TSD.

[6] Interim TRC limits come from the Water Pollution Control Federation's *Chlorination of Wastewater* (1976) and standard operating practices. *Chlorination of Wastewater* states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if 0.5 mg/L (500 µg/L) chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time and the proper amount of de-chlorination can meet a 0.5 mg/L total TRC effluent limit on a monthly average basis.

Final TRC limits are calculated in accordance with EPA's 1991 TSD. *Note that the TRC limit concentrations are displayed in µg/L. For permit compliance evaluation, the Star WWTP will have to meet the Minimum Level (ML) for TRC, 50 µg/L AML, at the end of the compliance schedule period in order to be deemed in compliance with the final TRC limits in this permit.

[7] Interim seasonal AML for TP is set equal to the 95th percentile of the facility supplemental data on TP concentrations in the effluent from 2006-2013; MDL calculated using the EPA TSD Table 5-3. The mass based limit is calculated from the concentration limit using the design flow of the facility, consistent with 40 CFR 122.45(b)(1), and the interim limits must be met through the time period of the compliance schedule.

Final seasonal TP limit calculated based on the *IDEQ SR-HC TMDL Submitted to EPA in July 2003 and revised in June 2004* water quality target for TP. *Note that the TP limit is displayed in µg/L. This limit must be met by the end of the compliance schedule period.

D. Compliance Schedule for Meeting Effluent Limits

Schedules of compliance are authorized at 40 CFR 122.47 and by Section 400.03 of the Idaho WQS. The Idaho WQS allow for compliance schedules "when new limitations are in the permit for the first time." Federal regulations allow for compliance schedules "when appropriate," and mandate that the schedules require permit compliance as soon as possible. If a permit establishes a compliance schedule that exceeds 1 year from the date of final permit issuance, NPDES regulations require that the schedule set forth interim requirements and deliverable dates.

The time between the interim requirement dates must not exceed 1 year, and when the time necessary to complete any interim requirement is more than 1 year (such as the construction of an upgraded facility), the schedule must require reports on progress toward completion, including a projected completion date, with specified dates for the submission of progress reports. Federal regulations require that the Permittee must notify EPA in writing of compliance or non-compliance with the interim or final effluent limitations, or submit the progress reports 14 days following each interim and final date of compliance. The regulations also require that interim effluent limits be at least as stringent as the final limits in the previous permit, if applicable [40 CFR 122.44(l)(1)].

EPA policy states that, in order to grant a compliance schedule, a permitting authority must make a reasonable finding that the Permittee cannot comply with the effluent limit immediately upon the effective date of the final permit (see the U.S. EPA NPDES Permit Writers' Manual, Section 9.1.3 http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45).

The proposed effluent limits for ammonia, TRC, and TP are new limits for the Star WWTP. EPA evaluated the Star WWTP effluent data in order to determine whether the facility could

consistently comply with the new limits in the draft Permit. The table below summarizes this evaluation. The draft Permit proposes schedules of compliance for those new limits that are not achievable immediately upon the effective date of the final Permit.

Table 8. Immediate Achievability of New WQBELs

Immediate Achievability of New Water Quality-based Effluent Limitations		
Parameter	**Season**	**Achievable Immediately?**
Total Residual Chlorine (TRC)		No
Total Ammonia as N		No
Total Phosphorus (TP)	May- September (TMDL WLA)	No

EPA has determined that the Star WWTP cannot comply with the new WQBELs for total ammonia as N, TRC or TP immediately upon the effective date of the final permit. Therefore, the draft Permit outlines a schedule of compliance for the new limits.

The proposed compliance schedule allows the Permittee three (3) years 11 months after the effective date of the final Permit to meet the TRC limitation, and nine (9) years 11 months after the effective date of the final Permit to meet the total ammonia as N and TP effluent limitations. These schedules are set in order for the Permittee to plan, design, and construct the necessary upgrades to the facility that will be required in order to meet the final limitations in the Permit.

Ammonia

The draft Permit includes a final AML for total ammonia as N of 4.1 mg/L and 18.2 mg/L for the MDL. These concentration based limits are complemented with mass-based limits for ammonia of 63 lbs/day for the AML and 281 lbs/day for the MDL. The supplemental data provided by the facility and evaluated by the EPA shows that the average ammonia concentration measured from 2006-2013 was 1.69 mg/L, with a minimum concentration during that period was 0.04 mg/L and a maximum concentration was 14.9 mg/L. The 95th percentile of the data set was 5.4 mg/L, so EPA set that concentration as the interim AML. Using the 1991 EPA TSD statistical procedures to translate the AML into the MDL, EPA calculated a MDL of 24 mg/L. Table 5-3 in the TSD gives the multipliers for calculating MDLs from AMLs, and when the CV is 1.4 and n=30, the multiplier is 4.47. Therefore, 5.4 mg/L x 4.47 = 24 mg/L. The interim concentration limits are complemented with mass-based limits for ammonia of 83 lbs/day for the AML and 370 lbs/day for the MDL.

When the EPA graphed the supplemental data, it became clear that the MBR effluent has lower concentrations of ammonia than does the blended effluent (MBR plus lagoons). In order for the Star WWTP to consistently meet the ammonia limits, and at the same time meet the TP limits, the facility is discussing the eventual phase-out of the lagoons and the need to design a new treatment plant that would replace the lagoon capacity. The time necessary to plan, design, and construct a new facility has been factored into the proposed compliance schedule included in the draft Permit. The interim limits must be met by the facility until the end of the compliance schedule for ammonia, at which time the final limits must be met.

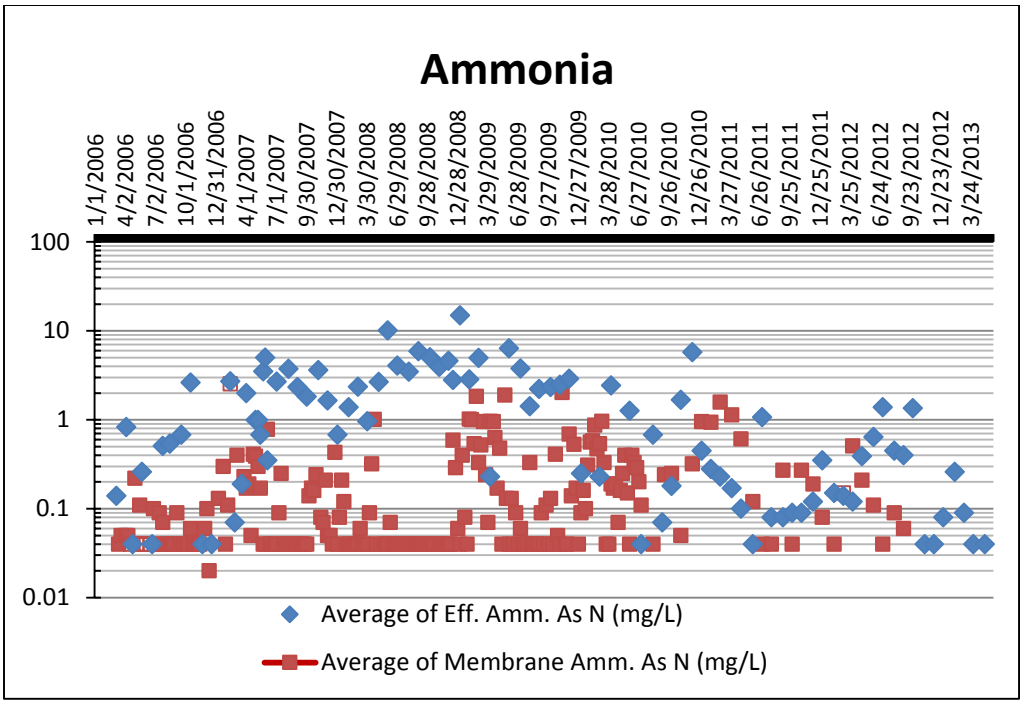

Figure 4. Graph of Star WWTP Effluent Ammonia Data From 2006-2013

TRC

The State of Idaho's water quality criteria for chlorine are 11 µg/L acute and 19 µg/L chronic. The draft permit includes an AML for TRC of 10 µg/L and a MDL for TRC of 20 µg/L. A mixing zone allowance for the Star WWTP was authorized by IDEQ at 25% of the critical flow volumes of the LK Canal for ammonia and chlorine in the draft 401 certification (See Appendix H). The permit limits ensure that the acute and chronic WQS are met at the edge of the acute and chronic mixing zones, respectively. The mass loading AML for TRC is 0.15 lbs/day and MDL mass loading limit is 0.32 lbs/day.

The DMR data provided by the facility from 2008-2013 reported an average effluent chlorine concentration of 1.7 mg/L, or 1700 µg/L. The range of chlorine in the effluent was between 600 µg/L and 5100 µ/L. The 95% percentile of chlorine concentrations in the effluent was 4300 µg/L.

The interim limit for TRC – 0.5 mg/L AML -- is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if 0.5 mg/L residual chlorine is maintained after 15 minutes of contact time. Therefore, a WWTP that provides adequate chlorine contact time can meet a 0.5 mg/L TRC limit on a monthly average basis.

In addition to AMLs, NPDES regulations require effluent limits for POTWs to be expressed as AWLs unless impracticable. For TBELs, 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.

Meeting the final TRC limits will not be immediately achievable upon the effective date of the final Permit. The facility will need time to plan, design, and implement the preferred alternative for reducing TRC in order to meet the Permit limit, while simultaneously planning, designing and constructing a new facility that can simultaneously meet the TRC, ammonia, and TP limits in the longer term, as well as meet the demands for future growth. Therefore, a compliance schedule for meeting the TRC effluent limitation is appropriate. The interim limits must be met by the facility until the end of the compliance schedule for TRC, at which time the final limits must be met.

Total Phosphorus

The draft Permit proposes an AML for total phosphorus (TP) of 70 µg/L. The Star WWTP must make physical modifications to its treatment technologies to meet the water quality target for reducing total phosphorus as discussed in the IDEQ SR-HC TMDL. The supplemental data provided by the facility and evaluated by the EPA shows that the average TP concentration measured from 2006-2013 was 2260 µg/L (2.26 mg/L) with a minimum concentration during that time period of 330 µg/L (0.33 mg/L) and a maximum concentration of 6020 µg/L (6.02 mg/L). Therefore, the discharge cannot be in compliance with the TP AML upon the effective date of the Permit; and a compliance schedule is appropriate. EPA calculated an interim seasonal AML TP limitation of 4.5 mg/L, which represents the 95th percentile of the TP concentration in the effluent as reported in the facility supplemental data taken from 2006-2013. The interim limits must be met by the facility until the end of the compliance schedule for TP, at which time the final limits must be met.

The MBR facility currently removes 86% of the total phosphorus in the influent. The Star WWTP does not add any chemical treatment for additional phosphorus removal at this time. (telecommunication with Ken Vose, WWTP Operator, June 5, 2013)

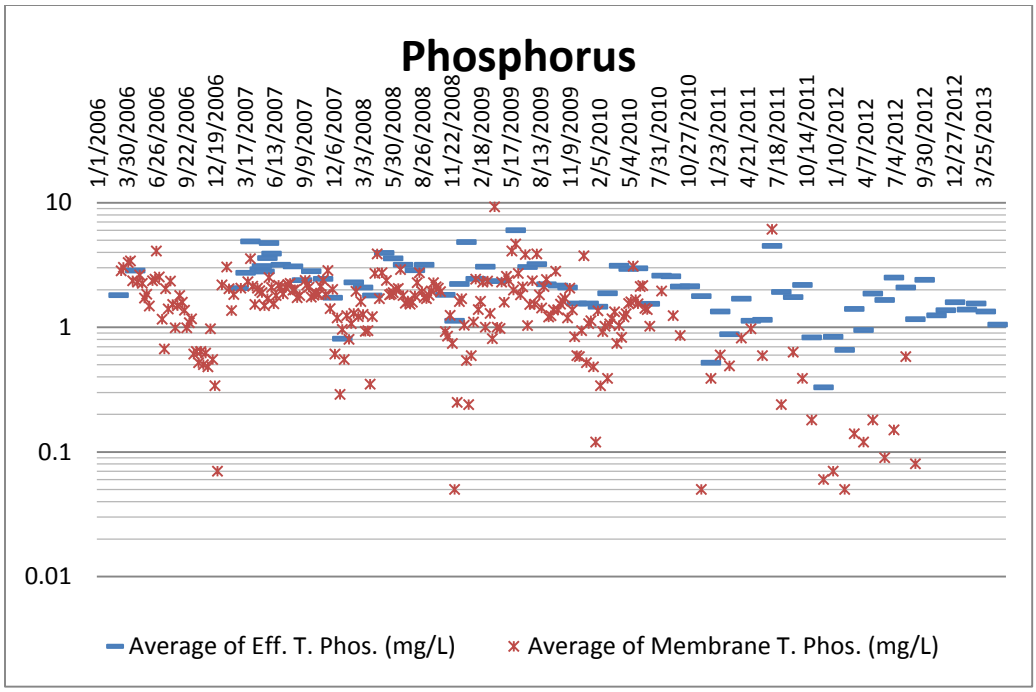

Figure 5. Graph of Star WWTP effluent TP data from 2006-2013

The compliance schedule was included in the draft IDEQ 401 certification. See Part I.C. of the draft Permit for more information about compliance schedules.

E. Basis for Effluent and Surface Water Monitoring

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

The draft Permit also requires the Permittee to perform the effluent monitoring required by Parts B.6 and D of the NPDES Form 2A application. Monitoring for the parameters required in the application ensures that these data will be available when the Permittee applies for a renewal of its NPDES permit in five (5) years. The Form 2A application requires sampling data for a small number of pollutants for municipal WWTPs with a design flow capacity of 0.1 mgd or greater (Part B.6 of the application) and additional data for other priority pollutants, as well as whole effluent toxicity (WET) testing, for facilities with a design flow capacity of 1.0 mgd or greater (Parts D and E of the application). The draft Permit incorporates the monitoring performed by the Star WWTP for the parameters in Part D of its July 2013 application, as required by NPDES regulations for any facility with a design flow capacity of 1.0 mgd or greater. It also requires quarterly WET testing, alternating through different quarters each year, in order to have the required data available to be submitted to the EPA with the next permit application in five (5) years. See Section I.D. of the draft Permit for more information on the WET requirements for the Star WWTP during this permit cycle. The Permittee is responsible for conducting monitoring and for reporting the results to the EPA on monthly DMRs and/or the next NPDES permit application, as appropriate.

F. Effluent Monitoring

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

The following table presents the proposed effluent monitoring requirements in the draft permit for the Star WWTP. 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.

The Star WWTP must monitor the influent at a point prior to treatment and must monitor the effluent after the last treatment unit prior to discharge to the LK Canal.

Table 9. Effluent Monitoring Requirements

Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Flow[1]	mgd	Effluent	Continuous	Recording
Temperature[2,9]	°C	Influent &Effluent	Continuous	Recording
BOD_5[1]	mg/L	Influent & Effluent	1/week	24-hour composite
	lbs/day	--		Calculation[7]
	% Removal	--		Calculation[8]
TSS[1]	mg/L	Influent & Effluent	1/week	24-hour composite
	lbs/day	--		Calculation[7]
	% Removal	--		Calculation[8]
pH[3]	standard units	Effluent	1/week	Grab
E. Coli[3]	#/100 ml	Effluent	5/month	Grab
Total Residual Chlorine[4]	µg/L	Effluent	2/week	Grab
	lbs/day	--		Calculation[7]
Total Ammonia as N[5]	mg/L	Effluent	1/week	24-hour composite
	lbs/day	Effluent		Calculation
Total Phosphorus[6]	mg/L	Effluent	1/week	24-hour composite
	lbs/day	--		Calculation[7]
Arsenic, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Cadmium, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite

Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Chromium, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Copper, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Lead, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Mercury, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Nickel, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Selenium, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Silver, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Zinc, Total Recoverable	µg/L	Effluent	1/every 6 months: June and December	24-hour composite
Oil and Grease (for the NPDES Form 2A application Part B6)	mg/L	Effluent	3/ 4.5 years: once each in years 2,3,and 4[10]	Grab
Dissolved Oxygen(for the NPDES Form 2A application Part B6)	mg/L	Effluent	3/ 4.5 years once each in years 2,3,and 4[10]	Grab
Total Kjeldahl Nitrogen (for the NPDES Form 2A application Part B6)	mg/L	Effluent	3/ 4.5 years once each in years 2,3,and 4[10]	24-hour composite
Nitrate-Nitrite (for the NPDES Form 2A application Part B6)	mg/L	Effluent	3/ 4.5 years once each in years 2,3,and 4[10]	24-hour composite
Total Dissolved Solids (TDS) (for the NPDES Form 2A application Part B6)	mg/L	Effluent	3/ 4.5 years: once each in years 2,3,and 4[10]	24-hour composite

Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
Parameters required for the NPDES Application Form 2A Expanded Effluent Testing (Part D, excluding the metals required more frequently above)	multiple	Effluent	1/year[11]	24-hour composite
Parameters required for the NPDES Application Form 2A Toxicity Testing (Part E; i.e. Whole Effluent Toxicity/WET Testing)	TU_c	Effluent	Annual testing during alternating quarters[12]	24-hour composite
Methylmercury (fish tissue criterion)	mg/kg	Boise River locations determined in consultation with IDEQ	Initial sampling to occur within 2 years. See Part I.F of the Permit	See Part I.F of the Permit

Notes:

1. Flow, BOD, and TSS monitoring were part of the previous Permit's monitoring requirements. There is no change to the proposed sampling frequency in the draft Permit.
2. Temperature monitoring was part of the previous Permit's monitoring requirements. However, the sampling frequency has changed from 3 times/week to continuous temperature monitoring. Continuous temperature monitoring in NPDES permits was requested by IDEQ in order to inform the development of TMDLs for temperature-impaired waters throughout the State of Idaho. In order to determine if surface waters meet the water quality criteria for temperature and provide for the protection of aquatic life uses, NPDES permits in Idaho require continuous temperature monitoring.
3. pH and *E. coli* (formerly fecal coliform) were part of the previous Permit's monitoring requirements. The sampling frequency for pH has not changed. However, the sampling frequency for *E. coli* has been changed, in order to comply with the State of Idaho's WQS requiring that *E. coli* samples be taken 5 times/month. [IDAPA 58.01.02.251.01 (a)]
4. Chlorine monitoring was part of the previous Permit's monitoring requirements. However, the sampling frequency for chlorine has increased to 2 times/week as chlorine is a toxic pollutant, there is a new chlorine limit proposed in the Permit, and because the Permittee needs to ensure compliance with the new chlorine limit in order to not be in violation of the Idaho WQS for chlorine.
5. Ammonia monitoring was part of the previous Permit's monitoring requirements. However, the sampling frequency for ammonia has increased to 1 time/week as there is a new ammonia limit in the Permit, and because the Permittee needs to ensure compliance with the ammonia limit in order to not be in violation of the WQS for ammonia.
6. Total phosphorus (TP) monitoring was part of the previous Permit's monitoring requirements. However, the sampling frequency for TP has increased to 1 time/week, because there is a new TP limit in the Permit, as TP is a known problem impairing the Boise and Snake Rivers in southeastern Idaho. IDEQ is developing a draft TMDL for TP for the Lower Boise River watershed and the TP monitoring by the Permittee may help to inform the TMDL.
7. The mass-based loading for BOD and TSS (lbs/day) is calculated by multiplying the concentrations required by the secondary treatment standards (in mg/L) by the design flow of the facility in mgd and a conversion factor of 8.34 (to make sure the units convert to lbs/day).

8. The monthly average percent removal for BOD and TSS must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month, i.e., (average monthly influent – average monthly effluent) ÷ average monthly influent.
9. Influent and effluent samples must be taken over approximately the same period.
10. For the parameters that must be sampled 3 times/5 years for the required parts of the NPDES Form 2A Application, samples should be taken once a year during Years 3, 4 and 5 of this Permit cycle – at least 180 days before the Permit will expire. The next Permit application is due 180 days before this Permit expires in order to be administratively extended per the NPDES regulations at 40 CFR 122.21(c)(1)
11. Expanded Effluent Testing - See NPDES Permit Application Form 2A, Part D for the list of pollutants to be included in this testing.
12. Testing must be conducted annually during alternating quarters. Quarters are defined as: January 1 to March 31; April 1 to June 30; July 1 to September 30; and, October 1 to December 31. The Permittee must use sufficiently sensitive analytical methods in accordance with Part I.B.8 of this Permit.

G. Monitoring Changes from the Previous Permit

The previous Permit required effluent monitoring for a variety of parameters. The purpose of the monitoring was to assure that appropriate data was available for the next Permit cycle. In general, the EPA's anti-backsliding regulations at 40 CFR 122.44(l)(1) prohibit the backsliding of any conditions (e.g., monitoring frequencies) unless the circumstances on which the previous Permit was based have materially and substantially changed since the time the previous Permit was issued and which would constitute a cause for Permit modification pursuant to 40 CFR 122.62.

The regulations at 40 CFR 122.62 allow modification of Permit conditions if new information was received that was not available at the time of Permit issuance. The EPA considers the monitoring data gathered by the Star WWTP since issuance of the 1999 Permit to be new information that was not available at the time of issuance of the 1999 Permit, therefore the monitoring requirements may be modified in the draft Permit for the next Permit cycle. The EPA reviewed the monitoring results provided by the Star WWTP in monthly DMRs and determined that the monitoring of some effluent parameters required adjustments. For example, fecal coliform is no longer included in the WQS for the State of Idaho, although it has been replaced by *E. coli*; and total phosphorus is now the nutrient of concern, rather than ortho-phosphate.

Some parameters were included in the 1999 Permit but now need only to be monitored at a reduced frequency in order to meet the requirements of NPDES Application Form 2A (e.g., total kjeldahl nitrogen, nitrate/nitrite and total dissolved solids). In addition, monitoring for TDS, oil and grease, and DO was added to the list of effluent monitoring parameters in the draft Permit because these parameters are required by Section B6 of the NPDES application Form 2A. Ortho-phosphate has been removed from the monitoring requirements of the draft Permit. The EPA is also requiring new monitoring for the list of pollutants found in NPDES Permit Application Form 2A Part D and the required monitoring found in Part E for major discharge facilities with a design flow capacity of 1.0 mgd or greater.

As stated above, monitoring for bacteria has changed since the previous Permit was issued. See Section II.C for more information on the change to the water quality criteria for bacteria.

E. coli must be monitored 5 times per month in order maintain compliance with the State of Idaho's revised WQS using *E. coli* as an indicator for protection of the primary contact recreation use of surface waters in the State of Idaho. *E. coli* sampling results must be reported in the DMR to the EPA.

Continuous Temperature Monitoring
The previous Permit required effluent temperature monitoring 3 times a week. The need for continuous temperature monitoring of both the Star WWTP effluent and the receiving water upstream of the discharge during this Permit cycle is to assist in collecting the necessary data for development of WLAs in the IDEQ temperature TMDL and will provide information for ESA consultation.

The temperature monitoring values for ambient surface water monitoring should be generated from a recording device with a minimum of 48 evenly spaced measurements in a 24-hour period (i.e., every 30 minutes). The temperature monitoring values for effluent monitoring should be generated from a recording device with a minimum of 24 evenly spaced measurements in a 24-hour period (i.e., every hour). Four years of both effluent and ambient monitoring data is recommended and the period of monitoring at the two locations should coincide. The temperature monitoring results must be reported monthly with the DMR to the EPA.

Reporting of the instantaneous maximum and the maximum daily average temperatures recorded at both the influent and the effluent continuous recording devices is required. The Permittee must submit an electronic ASCII text file to IDEQ and the EPA annually, in order that both agencies can receive all four years of recorded data.

Monitoring for methylmercury
The Star WWTP has not previously had to monitor the discharge of mercury in the effluent, but a mercury monitoring requirement is being proposed in the draft Permit in order to collect the data necessary to determine the facility's RP to cause or contribute to an exceedance of the State of Idaho WQS for mercury applicable to the canal. The IDEQ developed the Implementation Guidance for the Idaho Mercury Water Quality Criteria in April of 2005 and the EPA published the National Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion in April of 2010. For more information on the State of Idaho's total mercury water column criteria for the protection of aquatic life and methylmercury fish tissue criteria for the protection of human health, see Section III.A of this fact sheet.

The strategy for implementing the methylmercury criterion within the NPDES framework is to use a tiered approach based on available monitoring data. Because mercury monitoring data on effluent and receiving waters in Idaho is still needed, the first step for the Star WWTP in this Permit cycle is to establish if the facility's discharge has the RP to exceed the total mercury and the methylmercury criteria applicable to the LK Canal and the Lower Boise River downstream.

Therefore, the draft Permit includes a new monitoring requirement to sample for total mercury in the effluent semi-annually for each year of this Permit cycle in order to establish if the facility has the RP to exceed the total mercury criteria. There is also a new monitoring requirement to sample for methylmercury in fish tissue in order to determine if the Star WWTP has the RP to exceed the state's methylmercury criterion.

The fish tissue monitoring, in accordance with the Idaho Implementation Guidance, can be conducted either on a facility specific basis or within the proposed cooperative fish tissue monitoring program. The Lower Boise River watershed is a specific geographic area within which to determine if fish tissue concentrations of methylmercury are compliant with the State of Idaho's methylmercury criterion. The protocol established in the NPDES Permit issued to the City of Boise sets the fish tissue monitoring requirements as once every two years in 5 locations along the Boise River in the Lower Boise River watershed, and once a year at one specific location along the Boise River. The Star WWTP can monitor for methylmercury in fish tissue on the Boise River at one point upstream and one point downstream from the facility; or choose to participate in the cooperative effort underway between the USGS and the City of Boise to develop and implement a fish tissue and surface water monitoring plan for total mercury and methylmercury for the larger Lower Boise River watershed. If the Star WWTP is interested in satisfying the methylmercury monitoring requirement by joining in the cooperative effort; ensuring that the monitoring locations chosen for the cooperative effort include one location in the Boise River upstream of the facility and one location in the Boise River downstream of the facility, then EPA can help as necessary in arranging participation.

Metals Monitoring
As discussed previously, since the last Permit was issued in 1999, the Star WWTP has increased design flow capacity to 1.85 MGD. The EPA proposes that the WWTP monitor semi-annually for the suite of metal parameters in order to evaluate whether the concentration of these metals are being discharged have the RP to contribute to excursions about the water quality standards. Metals monitoring is a common requirement for major POTW facilities in Idaho. Parameters to be monitored include antimony, nickel, zinc, silver, lead, copper, cadmium, chromium, and others.

Whole Effluent Toxicity (WET) Testing
As a major facility, the draft Permit requires WET testing of the Star WWTP effluent. The definition of major facility is included in the draft Permit Definitions (Part VI.) The draft Permit includes a requirement that the WWTP conducts tests quarterly, during the 4th year of this Permit cycle, and reports the WET results in chronic toxic units (TU_c). See the Permit Part I.D. for more information.

H. Surface Water Monitoring

Surface water monitoring may be required for pollutants of concern in order to assess the assimilative capacity of the receiving water for the pollutant. In addition, surface water monitoring may be required for pollutants on which the water quality criteria calculations are dependent (i.e., pH, temperature, hardness), and to collect data for TMDL development if the

facility discharges to an impaired water body. The following table presents the proposed surface water monitoring requirements for the draft Permit. **The Star WWTP** should begin monitoring the LK Canal by March 15, 2015, at a nearby point upstream of Outfall 001. To the extent practicable, surface water samples should be taken on the same day as effluent samples. Surface water monitoring results must be submitted with the monthly DMR to the EPA using NetDMR. Note that metals must be analyzed for total recoverable metal concentrations.

Table 10. Lawrence Kennedy Canal Surface Water Monitoring

Lawrence-Kennedy Canal Surface Water Monitoring		
Parameter	**Sample Frequency**	**Sample Type**
Flow, mgd	Continuous	Recording
Temperature, C°	Continuous	Recording
TSS	Monthly for first 12 months	Grab
pH, standard units	Monthly for first 12 months	Grab
Total Residual Chlorine µg/L	Monthly	Grab
Total Ammonia as N, mg/L	Monthly	Grab
Total Phosphorous, mg/L	Monthly	Grab
Hardness	Monthly	Grab
Mercury, Total Recoverable	1/every 6 months: June and December	Grab
Copper, Total Recoverable	1/every 6 months: June and December	Grab
Lead, Total Recoverable	1/every 6 months: June and December	Grab
Nickel, Total Recoverable	1/every 6 months: June and December	Grab
Zinc, Total Recoverable	1/every 6 months: June and December	Grab

I. Submission of Discharge Monitoring Reports

During the period between the effective date of the Permit and six months from the effective date, the Permittee must either submit monitoring data and other reports in paper form, or must report electronically using NetDMR, a web-based tool that allows Permittees to electronically submit DMRs and other required reports via a secure internet connection.

After the first six months from the effective date of the Permit, the Permittee must submit monitoring data and other reports electronically using NetDMR.

The specific requirements regarding the submittal of data and reports in paper form and the use of NetDMR are included in the draft Permit Part III.B.

V. Sludge (Biosolids) Requirements

EPA Region 10 is using separate NPDES Permits to authorize wastewater discharges and sludge (or biosolids). The EPA has authority under the CWA to issue separate sludge-only

Permits for the purposes of regulating biosolids under the NPDES Program. The EPA may issue a sludge-only Permit to each facility at a later date, as appropriate.

Until such future issuance of a sludge-only NPDES Permit, sludge management and disposal activities at each facility will continue to be subject to the national sewage sludge requirements found at 40 CFR 503 and any requirements of the State of Idaho's biosolids program (See http://www.deq.idaho.gov/water-quality/wastewater/sludge-biosolids.aspx). The Part 503 regulations are self-implementing, which means that facilities must comply with the federal regulations whether or not a Permit that includes biosolids requirements has been issued.

The previous Permit for Star (1999) had included sludge management requirements in Section I.B. Those requirements will not be included verbatim in the draft Permit because they are covered by the self-implementing regulations at 40 CFR 503. In this case, since the conditions of 40 CFR 503 still apply to the facility, the EPA does not consider this change to constitute backsliding.

VI. Other Permit Conditions

A. Quality Assurance Plan

The federal data reporting regulation found at 40 CFR 122.41(e) requires the Permittee to develop procedures to ensure that the facility monitoring data submitted to the permitting authority is accurate, and to explain data anomalies in the monitoring data should they occur. This information is usually found in a facility Quality Assurance Plan (QAP). The SSWD is required to update the QAP for the Star WWTP within 180 days of the effective date of final Permit issuance. The QAP must include the standard operating procedures that the Permittee will follow during the collection, handling, storing, and shipping of water samples; the laboratory analysis; and data reporting. The Plan must be retained on site and be made available to the EPA and IDEQ upon request.

B. Operation and Maintenance Plan

This Permit requires the SSWD to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance (O&M) is essential to meeting discharge limits, monitoring requirements, and all other Permit requirements at all times. The Permittee is required to develop, or update, and implement an O&M Plan for the Star WWTP facility within 180 days of the effective date of the final Permit. The Plan must be retained on site and made available to the EPA and IDEQ upon request.

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

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fish and shellfish habitat, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this Permit.

Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES Permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet EPA-approved WQS.

This Permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. It requires that the Permittee identify SSO occurrences and their causes. In addition, the Permit establishes reporting, record keeping and third party notification of SSOs and requires the development of an Emergency Response and Public Notification Plan. Finally, this Permit also requires proper O&M of the collection system. The following specific Permit conditions apply:

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

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

Immediate (24-hour) 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 [40 CFR 122.41(l)(6)].

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

Written Reports – The Permittee is required to provide the EPA with a written report within 5 days of the time it became aware of any overflow that is subject to the immediate reporting provision [40 CFR 122.41(l)(6)(i)].

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 which could include

work orders associated with investigation of system problems related to a SSO, and which describe the steps; either taken or planned; to reduce, eliminate, and prevent reoccurrence of the SSO [40 CFR 122.41(j)].

Development of an Emergency Response and Public Notification Plan – Under this Permit and pursuant to the regulations cited above, the SSWD must develop and implement an emergency response and public notification plan that identifies measures to protect the public from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the Permit.

The Permittee must submit written notice to EPA and IDEQ that the plan has been developed and implemented within 90 days of the effective date of this Permit. Any existing emergency response and public notification plan may be modified for compliance with this section of the Permit.

D. Standard Permit Provisions

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

VII. Other Legal Requirements

A. Endangered Species Act (ESA)

In general, any EPA action approving new or revised WQS is considered a federal action that may require consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration- National Marine Fisheries Service (NOAA-NMFS) under section 7(a)(2) of the ESA, where the action may affect federally-listed endangered or threatened species or the designated critical habitat of such species. Section 7(a)(2) of the ESA requires federal agencies, in consultation with the Services, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of federally listed endangered or threatened species or result in the destruction or adverse modification of designated critical habitat of such species [16 U.S.C. 1536 (a)(2)]. Under relevant ESA implementing regulations, consultation is required for actions that "may affect" listed species or designated critical habitat [50 CFR 402.14]. The effects of the action are defined by regulation to include both the direct and indirect effects on species or critical habitat [50 CFR 402.02] However, consultation under section 7(a)(2) is not required where the action has no effect on listed species or designated critical habitat.

A review of the threatened and endangered species located in Idaho finds that bull trout are listed as threatened, meaning that they are known or believed to occur in Ada County; however, bull trout are listed for the entire coterminous lower 48 states. The Snake River physa snail is listed as endangered, meaning that the physa snail is known or believed to occur in Ada County; however, the USFWS website, http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=G01L, states that

> "the Snake River physa snail (Haitia (Physa) natricina) is a freshwater mollusk found in the middle Snake River of southern Idaho…It is believed to be confined to the Snake River, inhabiting areas of swift current on sand to boulder-sized substrate. In 1995, the Service reported the known modern range of the species to be from Grandview, Idaho (RM 487) to the Hagerman Reach of the Snake River (RM 573). More recent investigations have shown this species to occur outside of this historic range to as far downstream as Ontario, Oregon (RM 368), with another population known to occur downstream of Minidoka Dam (RM 675). While the species' current range is estimated to be over 300 river miles, the snail has been recorded in only 5% of over 1,000 samples collected within this area, and it has never been found in high densities. The recovery area for the species extends from Snake River mile 553 to Snake River mile 675."

EPA did not find that any ESA-listed species or critical habitat resides within the vicinity of the Star WWTP discharge, and determined that the discharge of treated municipal wastewater to the LK Canal will have no effect in the vicinity of the discharge. Additionally, EPA determined that the reissuance of the NPDES Permit will not adversely affect Essential Fish Habitat (EFH).

The information below summarizes the threatened and endangered species in Ada County, Idaho, which is as small a scale as UWFWS lists species. The list of threatened and endangered species in Idaho is available on the USFWS website at http://ecos.fws.gov/ecos/home.action. Information in the following table was accessed on October 22, 2013.

Table 11. USFWS List of Threatened and Endangered Species for Ada County, Idaho

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Action Status	Recovery Plan Stage
Fishes	Bull Trout (*Salvelinus confluentus*)	U.S.A., conterminous, lower 48 states	Threatened	Idaho Fish and Wildlife Office Boise Idaho (208) 378-5243	Draft Recovery Plan for the Jarbidge River Distinct Population Segment of Bull Trout		Draft
Mammals	Gray wolf (*Canis lupus*)	Northern Rocky Mountain DPS (delisted, except WY)	Recovery	Office Of The Regional Director Denver, Colorado (303) 236-7920	-	-	-
Snails	Snake River physa snail (*Physa natricina*)	Entire	Endangered	Idaho Fish And Wildlife Office, Boise, Idaho (208) 378-5243	Snake River Aquatic Species Recovery Plan	View Implementation Progress	Final

In addition to there being no threatened or endangered species in the vicinity of the discharge, USFWS shows no designated critical habitat information for Ada County in the vicinity of the discharge. http://criticalhabitat.fws.gov/crithab Critical habitat would be shown on the critical habitat mapper in red.

Figure 6. USFWS Habitat Mapper Showing No Critical Habitat in the Vicinity of the Discharge

Essential fish habitat (EFH) is considered the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries (NOAA-NMFS) when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH). An investigation using NOAA's Essential Fish Habitat online mapper shows that there is no EFH for freshwater salmon in the vicinity of the Star WWTP discharge. (http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html)

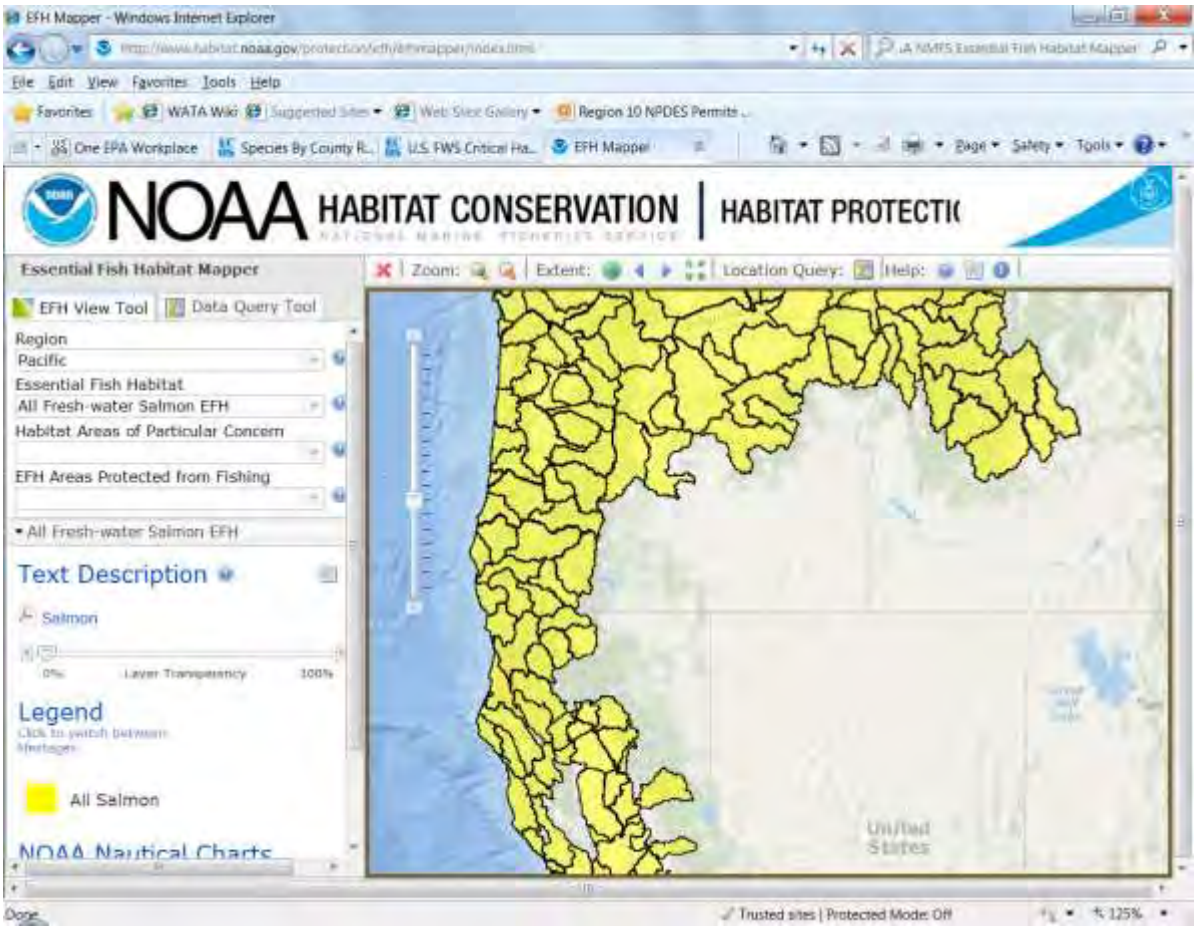

Figure 7. NOAA EFH Mapper Online Showing No EFH in the Vicinity of the Star WWTP Discharge

In addition to these online habitat mapping tools, prior email communication with the operator of the Star WWTP indicated that ducks and geese are typically the only wildlife observed around the LK canal (Hank Day, email from 4/18/2013). Therefore, upon review of the information available, the EPA determined that the draft Permit will have no effect on threatened or endangered species, critical habitat or EFH because there are no threatened or endangered species, listed critical habitat or EFH in the vicinity of the discharge of the Star WWTP. Therefore, ESA consultation with the Services is not required.

B. State Certification

Section 401 of the CWA requires EPA to seek State water quality 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 WQS, or treatment standards established pursuant to any State law or regulation.

The EPA received the draft § 401 Water Quality Certification from the IDEQ on April 23, 2014. A copy of the IDEQ draft certification is included in this fact sheet as Appendix H.

Pursuant to the provisions of Section 401(a)(1) of the CWA, as amended; 33 U.S.C. § 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the IDEQ has the authority to review NPDES permits and issue water quality certification decisions. In this case, the draft Permit is more protective than the 401 certification requires. See the discussion on WQS and the 401 certification in Section III.A of this fact sheet.

C. Permit Expiration

The final Permit will expire five years from its effective date.

VIII. References

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Idaho Department of Water Resources (IDWR). Water Rights Accounting http://maps.idwr.idaho.gov/qWRAccounting/WRA_Select.aspx Accessed August 1, 2013.

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USFWS Critical Habitat Portal. Accessed October 22, 2013. http://ecos.fws.gov/crithab/
National Oceanic and Atmospheric Administration (NOAA) -National Marine Fisheries Service (NMFS) Critical Habitat Mapper. Accessed October 22, 2013. http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html

Appendix A: Facility Information

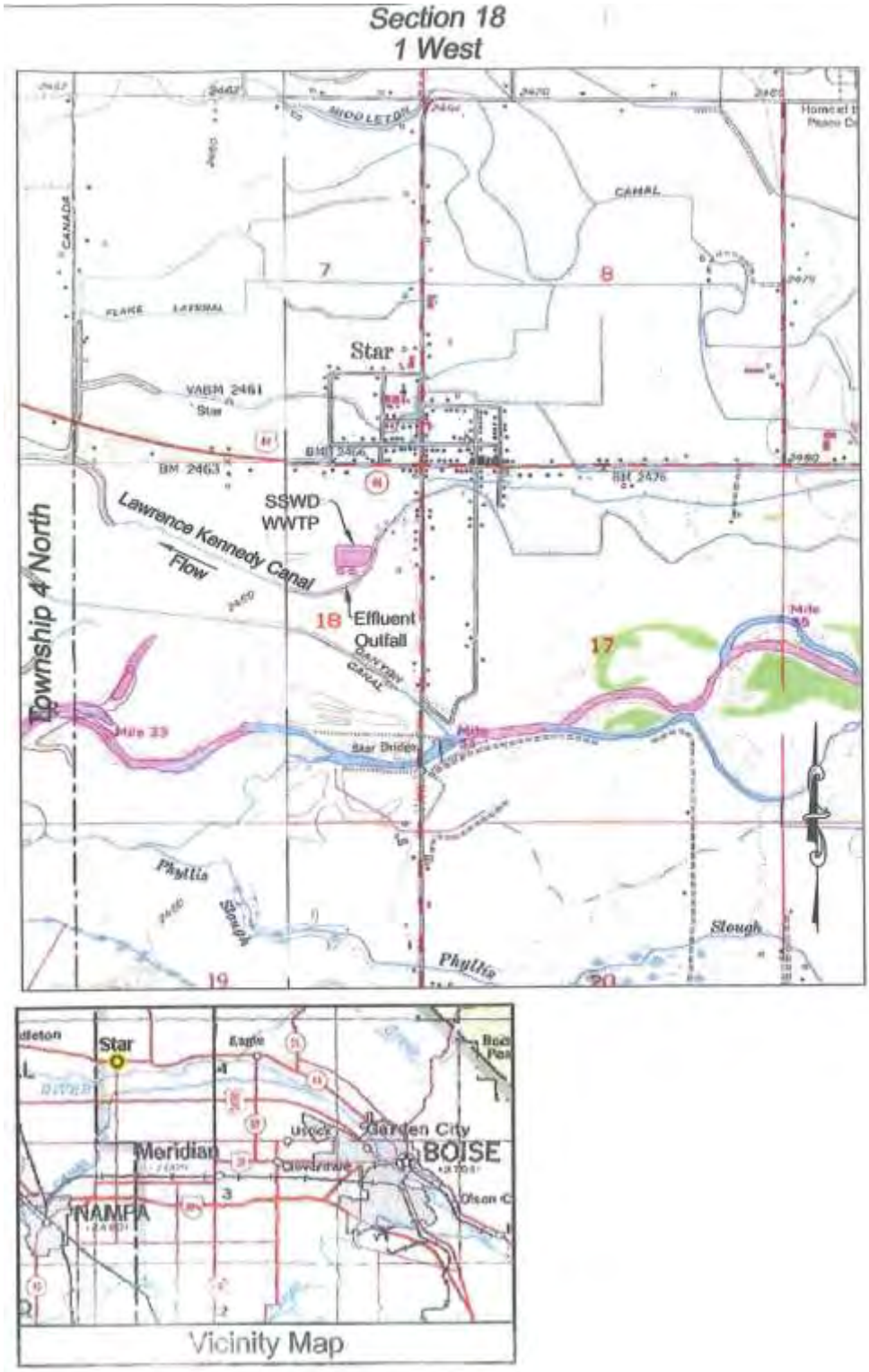

Figure 8. Topographic Map Snapshot - Location of the Star WWTP

The above figure is a topographic map of the City of Star, Idaho, and it shows the relative distance between the city and the Star WWTP, as well as the location of the outfall and the direction of the discharge flow. The discharge into the Lawrence-Kennedy (LK) Canal flows west, until it merges with the Boise River near the City of Middleton, about seven (7) miles downstream. See Page 8 of this fact sheet for more details on the flow of the LK Canal. The vicinity map in the figure above shows the relative location of the City of Star to the City of Boise, as well as to some of the other nearby cities in the Lower Boise River Watershed.

The figure below is a schematic drawing of the process flow at the Star WWTP. The influent is run through coarse screens, the grit removal chamber, and a 0.4 millimeter (mm) pore size fine screen at the headworks. The influent is treated both mechanically and biologically at the headworks, and then it goes to the splitter box, where the WWTP operator can split the flow between the lagoon system and the MBR system or send the entire influent through one of the two parallel systems. Approximately 20-30% of the influent is directed to the on-site 3-cell lagoon system during the irrigation season (approximately between mid-April and mid-October). The Star WWTP depends on both the MBR and the lagoons to meet demand and flow conditions during the irrigation season, when the facility experiences high infiltration and inflow (I/I) to the plant from the high groundwater table.

The first chamber in the MBR is the anaerobic basin, after which the flow goes to the anoxic basin, then the pre-aeration basin. These basins are where the biological removal of pollutants in the wastewater stream takes place. After the biological removal, the flow then moves through the MBR filters where the mechanical process of filtration takes over, in order to remove more pollutants from the wastewater stream. The MBR has 12,000 filters with a pore size of zero point four (0.4) microns. The MBR permeate that has moved through the filters flows to the UV disinfection building. After disinfection, the permeate is either sampled and then discharged to the LK Canal at Outfall 001; or blended with any treated effluent coming from the lagoons during the irrigation season, sampled, and then discharged to the LK Canal. The UV treated effluent flows through the chlorine contact chamber when blended with the lagoon effluent.

When the lagoons are running, the influent that is diverted to the lagoon system may spend up to 28 days in the lagoon for aeration, biologic removal, and settling of pollutants and pathogens. After biologic removal in the lagoon, the flow is sent to intermittent sand filters, and then to the chlorine contact chamber for disinfection with sodium hypochlorite prior to sampling and discharge to the LK Canal.

Solid waste handling is processed a screw press for dewatering that reduces solids to 14-16%. The solids are collected in a dumpster and hauled off-site to a landfill.

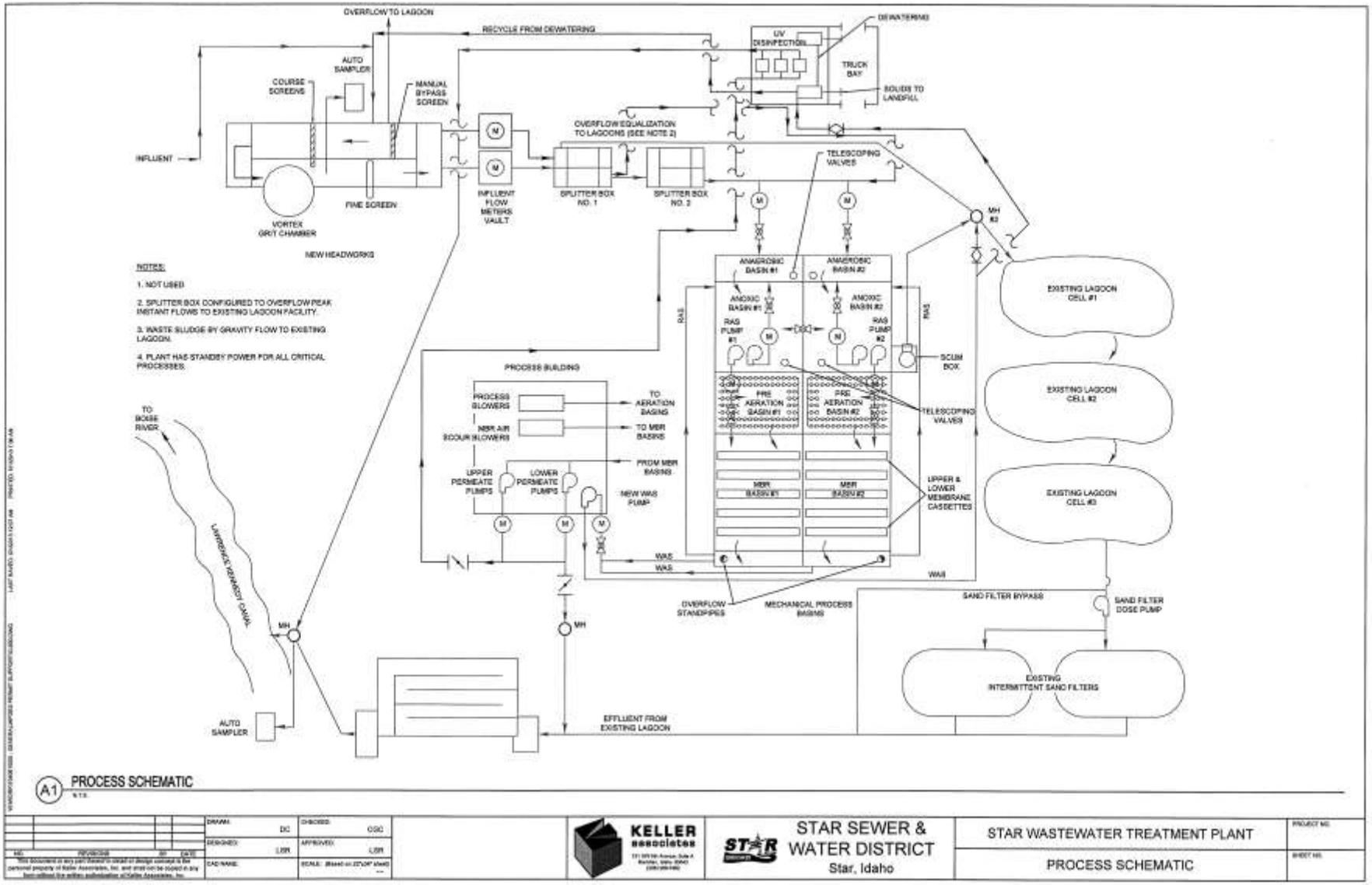

Figure 9. Process Schematic of the Star WWTP

Appendix B: Discharge Monitoring Report (DMR) Data

	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Percent Removal	Raw Sewage Influent	Raw Sewage Influent
	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	Chlorine, total residual	Chlorine, total residual	Coliform, fecal MF, MFC broth, 44.5 C	Flow, in conduit or thru treatment plant	Nitrogen, ammonia total (as N)	pH	pH	Solids, total suspended	Solids, total suspended	Temperature, water deg. centigrade	Temperature, water deg. centigrade	BOD, 5-day, percent removal	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C
	MO AVG	MO AVG	WKLY AVG	WKLY AVG	MAXIMUM	MINIMUM	WKLY GEO	MO AVG	DAILY MX	MAXIMUM	MINIMUM	MO AVG	WKLY AVG	MAXIMUM	MINIMUM	MN % RMV	MO AVG	MO AVG
Row Labels	lb/d	mg/L	lb/d	mg/L	mg/L	mg/L	#/100mL	MGD	mg/L	SU	SU	mg/L	mg/L	deg C	deg C	%	lb/d	mg/L
	124	45	179	65			200			9	6.5	70	105			65		
1/31/2008	31	9	44	9	0.91	0.4	24	0.417	0.68	7.98	7.06	6	16	13.7	5.2	94	543	156
2/29/2008	28	8	28	8	1.29	0.39	2	0.421	1.38	7.42	7.24	4	4	13.3	11.2	92	369	105
3/31/2008	37	11	49	11	0.62	0.21	2	0.403	2.36	7.49	7.19	11	11	14.4	12	92	454	135
4/30/2008	30	8	41	11	1.06	0.05	2	0.451	8.2	7.49	7.12	6	14	16.3	13.4	93	444	118
5/31/2008	55	10	61	11	0.88	0.38	8	0.663	2.67	7.63	7.13	7	9	19.1	14.6	86	382	69
6/30/2008	50	10	70	14	0.76	0.49	12	0.601	15.2	8.01	7.21	10	14	21	15.9	86	356	71
7/31/2008	57	10	86	11	0.65	0.41	21	0.678	4.07	7.82	7.44	14	18	21.7	19.9	81	300	53
8/31/2008	69	13	127	19	1.2	0.03	4	0.617	3.48	7.79	7.15	13	15	22.3	19.6	86	483	94
9/30/2008	76	14	132	18	0.91	0.03	4	0.6551	5.92	7.6	7.3	12	17	20.3	18.2	84	481	88
10/31/2008	71	16	97	22	1.94	0.52	8	0.531	5.03	7.46	7.19	20	47	19.6	14.5	82	385	87
11/30/2008	58	16	69	19	1.15	0.46	2	0.435	3.94	7.27	7.07	12	15	15.9	11	87	446	123
12/31/2008	49	13	91	24	0.86	0.6	22	0.454	4.6	7.55	7.06	7	7	7.55	7.06	91	541	143
1/31/2009	12	6	93	14	1.09	0.65	5	0.466	26.6	7.32	7.02	8	17	12.9	6.7	97	742	191
2/28/2009	11.3	3	15.1	3	1.27	0.65	2	0.451	2.85	7.21	7.01	4	6	14.1	11	98	572	152
3/31/2009	17.5	5	50.2	10	1.04	0.84	3	0.42	4.97	7.47	7.01	16	38	15.5	10.9	95	389	111
4/30/2009	12.2	3	12.2	3	1.6	0.31	9	0.487	0.23	7.51	6.98	3	3	16.3	10.1	98	524	129
5/31/2009	21	4	32	4	1.2	0.7	26	0.631	0.04	7.16	6.98	5	9	18.9	15.2	97	684	130
6/30/2009	54.2	10	94.3	13	1.3	0.26	13	0.6497	6.36	7.76	7.1	10	13	20.1	18.2	93	718	133
7/31/2009	80	16	89	18	1.4	0.44	25	0.596	3.78	7.82	7.1	22	29	22.6	19.1	88	691	139
8/31/2009	38	7	49	9	1.2	0.49	53	0.655	1.42	7.85	7.47	12	14	22.2	20.4	94	590	108
9/30/2009	45	9	70	11	1.1	0.44	10	0.597	2.2	7.72	7.52	11	16	21.8	19.4	92	588	118
10/31/2009	41	9	46	10	0.91	0.63	2	0.551	2.34	7.65	7.34	6	7	19.2	16.4	94	744	162
11/30/2009	33	9	41	11	0.69	0.2	2	0.445	2.48	7.5	4.8	4	4	17.5	13.8	92	434	117
12/31/2009	16	4	19	5	1.02	0.21	2	0.466	2.89	7.04	6.68	4	4	15.7	12	97	521	134
1/31/2010	16	4	20	5	1.03	0.44	6	0.47	0.19	8.33	6.63	6	14	15	7.7	98	631	161
2/28/2010	11	3	20	4	0.81	0.5	2	0.452	0.87	7	6.55	3	3	15	14.2	97	430	114
3/31/2010	14	4	19	4	1.45	0.32	2	0.408	0.23	7.26	6.6	5	12	15.5	12.8	97	402	118
4/30/2010	23	6	42	8	1.18	0.41	2	0.4556	2.43	7.47	6.99	13	32	16.6	12.6	95	445	117
5/31/2010	63	13	125	26	0.7	0.38	8	0.578	0.4	7.34	7.02	16	26	18.2	13.1	86	448	93
6/30/2010	18	4	24	4	5.1	0.3	8	0.537	1.26	7.35	6.97	6	10	20.4	17.1	95	371	83
7/31/2010	17	4	17	4	0.6	0.16	3	0.515	17.4	7.27	7.03	4	5	21.3	18.2	95	322	75
8/31/2010	17	4	22	5	4.1	0.25	10	0.521	0.68	8.62	7.12	11	14	22.2	19.6	96	469	108
9/30/2010	18	4	22	5	1.08	0.15	14	0.526	0.07	8.56	7.35	17	25	20.3	18.5	95	377	86
10/31/2010	17	4	21	4	1.27	0.32	8	0.4979	0.18	7.54	7.04	11	18	20.4	14.2	96	461	111
11/30/2010	16	4	15	3	1.99	0.45	2	0.474	1.67	7.49	6.93	5	11	17.9	13.4	97	474	120
12/31/2010	17	4	28	5		0.6	2	0.499	5.74	7.25	6.87	4	6	15.4	10.2	97	524	126
1/31/2011	17	4	22	4	1.72	0.51	2	0.494	0.45	7.14	6.94	4	4	15	14	97	573	139
2/28/2011	15	4	19	4	1.5	0.26	2	0.457	0.28	7.23	6.87	3	3	14.4	12.8	97	507	133
3/31/2011	15	4	24	4	1.41	0.13	2	0.4552	0.23	7.2	6.94	3.4	4	15	14	98	623	164
4/30/2011	16	4	9	4	1.25	0.43	2	0.461	1.13	7.17	6.98	4	4	15.5	14	97	508	132
5/31/2011	33	6	97	13	0.78	0.36	8	0.662	2.75	7.06	6.85	8	29	16.5	14.9	93	486	88
6/30/2011	21	4	31	6	2.88	0.17	8	0.6125	0.04	7.7	6.91	5	11	20.2	16.1	96	496	97
7/31/2011	21	4	25	4	2.51	0.33	3	0.636	1.07	7.39	6.88	14	43	20.6	19.6	95	462	87
8/31/2011	20	4	20	4	5	0.01	8	0.6052	0.08	8.43	6.91	6	15	22.6	20.1	80	424	84
9/30/2011	30	6	46	9	1.81	0.58	52	0.6083	0.08	7.99	7.08	15	18	22	20	94	482	95
10/31/2011	21	5	29	7	1.56	0.05	81	0.5036	0.09	7.48	6.94	11	31	20.9	17.5	96	475	113
11/30/2011	15	4	22	4	1.19	0.01	3	0.4229	0.09	7.2	6.92	5	15	18	14.6	98	677	192
12/31/2011	14	4	14	4	4.3	0.05	2	0.4203	0.12	7.57	6.86	3	3	16.2	12.7	98	571	163
1/31/2012	15	4	24	4	3.49	0.02	4	0.435	0.35	7.8	6.84	4	5	15.1	11.2	98	573	158
2/29/2012	10	3	14	3	1.68	0.02	3	0.4002	0.15	6.93	6.8	3	3	14.6	13.8	98	551	165
3/31/2012	10	3	14	4	1.16	0.02	2	0.4096	0.14	7.03	6.74	3	3	15.7	14	98	468	137
4/30/2012	12	3	18	3	3.2	0.02	2	0.4518	23.6	7.11	6.85	9	14	18	14.3	98	490	130
5/31/2012	20	4	34	6	3.05	0.58	2	0.6015	0.39	7.81	6.94	8	11	18.3	15.9	96	557	111
6/30/2012	21	4	21	4	4.3	0.23	3	0.6079	0.64	8.25	7.04	8	16	19.7	17.6	96	456	90
7/31/2012	23	4	19	3	2.01	0.38	9	0.6926	1.38	7.94	7.18	11	17	22.2	20.2	96	520	90
8/31/2012	28	5	28	5	1.32	0.29	6	0.6613	0.45	8.46	7.19	8	10	22.5	21.4	94	430	78
9/30/2012	22	4	25	4	2.46	0.32	10	0.6696	0.4	8.47	7.2	7	11	21.3	18.4	96	581	104
10/31/2012	26	5	31	6	1.74	0.43	8	0.6125	1.35	8.72	7.25	5	6	19.5	13.4	97	767	147
11/30/2012	14	3	14	3	0.87	0.02	3	0.5531	22.3	7.28	6.97	3	3	18	16	98	572	124
12/31/2012	14	3	17	3	2.87	0.02	2	0.5598	0.04	7.38	6.89	3	3	16.8	11.3	98	630	135
1/31/2013	20	4	29	6	5	0.02	39	0.5723	0.08	7.43	6.97	8	20	13.5	8	97	678	142
2/28/2013	14	3	14	3	1.31	0.02	13	0.557	0.26	7.34	6.96	3	3	12.9	10.4	98	715	154
3/31/2013	14	3	15	3	0.7	0.02	2	0.543	0.09	6.95	6.85	5	5	14.3	12.8	97	457	101
4/30/2013																		
Average	27.6	6.2	40.6	7.8	1.7	0.3	9.7	0.5	3.2	7.6	7.0	7.9	13.2	17.8	14.5	94.1	515.3	119.5
Minimum	10	3	9	3	0.6	0.01	2	0.4002	0.04	6.93	4.8	3	3	7.55	5.2	80	300	53
Maximum	80	16	132	26	5.1	0.84	81	0.6926	26.6	8.72	7.52	22	47	22.6	21.4	98	767	192
Count	63	63	63	63	62	63	63	63	63	63	63	63	63	63	63	63	63	63
Std Dev	18.1	3.7	31.6	5.7	1.2	0.2	14.2	0.1	5.7	0.4	0.3	4.6	10.1	3.2	3.8	4.7	109.7	30.0
CV	0.657	0.597	0.778	0.729	0.681	0.701	1.463	0.165	1.775	0.058	0.049	0.582	0.761	0.182	0.261	0.049	0.213	0.251
95th Percentile	68.4	13.9	97	19	4.3	0.648	37.7	0.6629	17.18	8.469	7.349	16	31.9	22.29	20.09	98	717.7	163.9
5th Percentile	11.37	3	14	3	0.6905	0.02	2	0.41034	0.071	7.031	6.635	3	3	13.32	7.73	84.2	369.2	75.3

Appendix C: Water Quality Criteria Summary

This appendix provides a summary of the water quality criteria applicable to the LK Canal at the point of discharge.

Idaho WQS include criteria necessary to protect designated beneficial uses. The standards are divided into three sections: General Water Quality Criteria, Surface Water Quality Criteria for Use Classifications, and Site-Specific Surface Water Quality Criteria. The EPA has determined that the criteria listed below are applicable to the LK Canal and the Boise River segment SW-5, downstream where the canal meets the river. This determination was based on (1) the applicable beneficial uses of the canal (i.e., cold water aquatic life, primary contact recreation, etc.), (2) the type of facility, (3) a review of the application materials submitted by the Permittee, and (4) the criteria applicable to the downstream segment SW-5 (i.e., cold water aquatic life, salmonid spawning, site specific criteria for temperature, primary contact recreation, etc.).

General Criteria (IDAPA 58.01.02.200)
Surface waters of the state shall be free from:

- hazardous materials,
- toxic substances in concentrations that impair designated beneficial uses,
- deleterious materials,
- radioactive materials,
- floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses,
- excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses,
- oxygen demanding materials in concentrations that would result in an anaerobic water conditions; and,
- sediment in quantities which impair designated beneficial uses.

A. Numeric Criteria for Toxics (IDAPA 58.01.02.210)

This section of the Idaho WQS provides the numeric criteria for toxic substances for waters designated for aquatic life, recreation, or domestic water supply use. Monitoring of the effluent has shown that the following toxic pollutants have been present at detectable levels:

Total Ammonia (as N)
Total Residual Chlorine (TRC)
Total Phosphorus (TP)
Copper
Zinc
Chloroform

However, the only pollutants present in the effluent with the RP to cause or contribute to an excursion of the WQS are ammonia, TP, and TRC. See the earlier RP discussion in Section IV.B of this fact sheet.

B. Surface Water Criteria To Protect Aquatic Life Uses (IDAPA 58.01.02.250)

1. pH: Within the range of 6.5 to 9.0
2. Total Dissolved Gas: <110% saturation at atmospheric pressure.

3. DO: Exceed 6 mg/L at all times.
4. Temperature: Water temperatures of 22°C or less with a maximum daily average of no greater than 19°C.
5. Ammonia: Ammonia criteria in Idaho are based on a formula which relies on the pH and temperature of the receiving water, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the ammonia criteria become more stringent as the pH and temperature of the receiving water increase. The EPA calculated the applicable water quality criteria for ammonia based on the receiving water data on temperature and pH sent to the EPA by the Star WWTP on June 17, 2013. As discussed previously in this fact sheet, the EPA used a receiving water temperature of 19.6°C and a pH of 6.9 in order to derive the water quality criteria for ammonia to be 26.15 mg/L acute, and 4.41 mg/L chronic.
6. Turbidity: Turbidity below any applicable mixing zone set by the Department (IDEQ) shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.
7. Surface Water Quality Criteria for Recreational Use Designation (IDAPA 58.01.02.251)

   a. Geometric Mean Criterion: Waters designated for primary or secondary contact recreation are not to contain *E. coli* in concentrations exceeding a geometric mean of 126 *E. coli* organisms per 100 ml based on a minimum of 5 samples taken every 3 to 7 days over a 30 day period.

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

C. Specific Criteria to Protect the Boise River Segment SW-5: River Mile 50 to Indian Creek (58.01.02.278.01 and 278.04)

Lower Boise River Subbasin, HUC 17050114 Subsection 140.12, Site Specific Criteria

- Boise River, SW-1 and SW-5 – Salmonid Spawning and Dissolved Oxygen. The waters of the Boise River for Veterans State Park to its mouth will have dissolved oxygen concentrations of six (6) mg/L or 75% of saturation, whichever is greater, during the spawning period of salmonid fishes inhabiting these waters.
- Boise River, SW-5 and SW-11a – Site-Specific Criteria for Water Temperature. A maximum weekly maximum temperature of thirteen (13) degrees C to protect brown trout, mountain whitefish and rainbow trout spawning and incubation applies from November 1 through May 30.

Appendix D: Low Flow Conditions and Dilution

A. Low Flow Conditions

The low flow conditions of a water body are used to determine WQBELs. In general, Idaho's WQS require criteria be evaluated at the following low flow receiving water conditions (See IDAPA 58.01.02.210.03) as defined below:

Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	harmonic mean flow
Ammonia	30B3 or 30Q10
1. The 1Q10 represents the lowest one day flow with an average recurrence frequency of once in 10 years. 2. The 1B3 is biologically based and indicates an allowable exceedence of once every 3 years. 3. The 7Q10 represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years. 4. The 4B3 is biologically based and indicates an allowable exceedance for 4 consecutive days once every 3 years. 5. The 30Q5 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years. 6. The 30Q10 represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 10 years. 7. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows.	

Knowing the low flow conditions of a water body helps a permit writer to determine whether there can be mixing zones for certain criteria allowed in the Permit, and whether the discharge, combined with a mixing allowance, will meet or exceed the criteria specified in the State of Idaho's WQS for any given pollutant of concern.

Idaho's WQS do not specify a low flow to use for acute and chronic ammonia criteria, however, the EPA's *Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia; Notice* (64 FR 719769 December 22, 1999) identifies the appropriate flows to be used. Note that EPA published a revised recommendation for water quality criteria to protect aquatic life from ammonia, however; the State of Idaho has not yet adopted, and therefore EPA has not approved, any changes to the WQS for ammonia in Idaho.

The EPA determined critical flows from using data on the IDWR website and subtracting the facility's design flow. Flow information for the Idaho canal system is captured as water rights accounting. http://maps.idwr.idaho.gov/qWRAccounting/WRA_Select.aspx EPA downloaded the historical dataset for the South Middleton Drain (downstream of the Star WWTP) and calculated critical flows. Because the data is for flow downstream of the treatment plant, EPA subtracted the design flow capacity of the plant from the calculated flows. At 1.85 MGD, the design flow of the WWTP is equivalent to 2.9 cfs.

B. Mixing Zones and Dilution

Under the Idaho WQS, a dilution allowance or mixing zone is permitted for some pollutants in applicable water bodies. Mixing zones are determined in permits on a case-by-case basis. A mixing zone is a designated area of the receiving water body where the effluent discharge undergoes initial dilution. The mixing zone may be extended, in some cases, to cover the secondary mixing that occurs in the receiving water body further downstream from the point of discharge. This mixing zone is designated by regulation to be where the WQS may be exceeded as long as acutely toxic conditions are

prevented (the EPA WQS Handbook, 1994). Regulations at 40 CFR 131.13 state that "States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances."

The State of Idaho WQS codify Idaho's mixing zone policy for point source discharges [IDAPA 58.01.02.060]. The policy allows IDEQ to authorize a mixing zone for a point source discharge after a biological, chemical, and physical appraisal of the receiving water and the proposed discharge. IDEQ considers the following principles in limiting the size of a mixing zone in flowing receiving waters (IDAPA 58.01.02.060.01.e):

i. The cumulative width of adjacent mixing zones when measured across the receiving water is not to exceed 50% of the total width of the receiving water at that point;
ii. The width of a mixing zone is not to exceed 25% of the stream width or 300 meters plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less;
iii. The mixing zone is to be no closer to the 10 year, 7 day low-flow shoreline than 15% of the stream width;
iv. The mixing zone is not to include more than 25% of the volume of the stream flow.

A dilution factor (DF) takes into account the critical design flow of the discharge facility and the State of Idaho's WQS regulatory mixing zone allowance. In the preliminary CWA 401 Certification, IDEQ proposes to authorize a mixing zone of 25% of the stream flow volume for ammonia and TRC.

The following formula is used to calculate a DF based on the allowed mixing:

$$DF = \frac{Q_e + Q_u \times \%MZ}{Q_e}$$

Where:

DF	=	Dilution Factor
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, 30B3, etc)
%MZ	=	Percent Mixing Zone

The EPA calculated a DF for the critical low flow conditions. DFs are calculated with the effluent flow rate set equal to the Star WWTP design flow of 1.85 mgd (equivalent to 2.9 cfs). The DF used for calculating the TRC and ammonia limits in the draft Permit is 1.1, as the low flow/annual DF is the most stringent, and as stated earlier, there is insufficient data on canal flows during the non-irrigation season. Refer to the following table for calculations of applicable DFs for the Star WWTP.

Table 12. Spreadsheet Calculations of the Dilution Factors for Critical Low Flow Conditions

Plant Data	Units	Design Flow
Design Flow	mgd	1.85
Design Flow	cfs - calculated	2.9
BOD_5	lb/day	
TSS	lb/day	

Annual Flows		
Critical Flow Parameter		**Used for evaluating criteria for:**
1Q10	1.1	**Aquatic Life Uses - Acute**
7Q10	1.1	**Aquatic Life Uses - Chronic**
30B3	1.1	**Ammonia**
30Q5	1.1	**Human Health – Non-carninogen**
Harmonic Mean	1.1	**Human Health – Carcinogen**

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	0.25	**1.1**	**1Q10**	
DF-edge of Chronic zone	0.25	**1.1**	**7Q10**	**91%**
Ammonia	0.25	**1.1**	**30B3**	
HH-Non-Carcinogen	1	**1.4**	**30Q5**	
HH-Carcinogen	1	**1.4**	**Harmonic Mean**	

Appendix E: Basis for Effluent Limits

The following discussion explains the derivation of TBELs and WQBELs proposed in the draft Permit. Part A discusses TBELs, Part B discusses WQBELs in general, Part C discusses anti-backsliding provisions, Part D discusses the effluent limits imposed due to the State's anti-degradation policy, and Part E presents a summary of the applicable Star WWTP facility specific limits included in the draft Permit.

A. Technology-Based Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. EPA has developed and promulgated "secondary treatment" effluent limitations in 40 CFR 133.102. These TBELs 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 limitations are listed below.

Table 13. Secondary Treatment Effluent Limitations

Secondary Treatment Effluent Limitations (40 CFR 133.102)		
Parameter	**30-day average**	**7-day average**
BOD_5	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
Removal for BOD_5 and TSS (concentration)	85% (minimum)	---
pH	within the limits of 6.0 - 9.0 s.u.	

Mass-Based Limits

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

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[1]

Since the design flow for this facility is 1.85 mgd, the technology based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 1.85 mgd × 8.34 = 463 lbs/day

Average Weekly Limit = 45 mg/L × 1.85 mgd × 8.34 = 694 lbs/day

However, as discussed previously in Section III.D. of this fact sheet, the mass limits for TSS correspond to the TSS WLA for the Star WWTP in the December 18, 1998 *Lower Boise River TMDL, Subbasin Assessment, Total Maximum Daily Loads* document.

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

Chlorine
Chlorine is often used to disinfect municipal wastewater prior to discharge. The Star WWTP uses chlorine disinfection. A 0.5 mg/L average monthly limit for TRC is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to 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.

The EPA has determined that the TBELs for chlorine are not stringent enough to ensure compliance with the WQS applicable to the receiving water. Therefore, the draft Permit proposes more stringent WQBELs for chlorine.

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis
Section 301(b)(1)(C) of the CWA requires the development of limitations in Permits necessary to meet state or tribal WQS. Point source discharges to state or tribal waters must also comply with limitations imposed by the state or tribe as part of its certification of each NPDES permit developed under section 401 of the CWA. The federal regulation at 40 CFR 122.4(d) prohibits the issuance of an NPDES permit that does not ensure compliance with the WQS of all affected states (i.e., the WQS of the receiving water body and downstream waters).

The NPDES regulations require point source permits include limits for all pollutants or parameters which are or may be discharged in an amount which will cause, have the RP to cause, or contribute to an excursion above any state or tribal WQS, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources must be derived from and comply with all applicable state or tribal WQS [40 CFR 122.44(d)(1)].

The regulations require the permitting authority to make this evaluation (called a "reasonable potential analysis or RPA") 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 Permit limits must be stringent enough to ensure that state or tribal WQS are met, and must be consistent with any available WLA provided by an EPA-approved TMDL assessment, if applicable. In the case of an available TMDL, the WLA provided by the TMDL for a particular pollutant will override the mass based calculations, since it will likely be the more stringent calculation of the two options.

RPAs
The EPA projects the downstream receiving water concentration for each pollutant of concern when evaluating the RP to cause, or contribute to an excursion above any State/Tribal water quality criterion. The EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific pollutant, then the discharge has the RP to cause or contribute to an excursion above the applicable WQS, and a WQBEL is required.

Sometimes it may be appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body and will decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the concentration of the pollutant in the receiving water is less than the criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by the State in the 401 certification.

The RP analyses for chlorine and ammonia were based on a mixing zone of 25% based on the IDEQ's draft certification. If IDEQ revises the allowable mixing zone in its final certification of this permit, the RP analyses for chlorine and ammonia will be revised accordingly.

Procedure for Deriving Water Quality-based Effluent Limits
The first step in developing a WQBEL is to develop a WLA for the pollutant. A WLA is the concentration or loading of a pollutant that the Permittee may discharge without causing or contributing to an exceedance of WQS in the receiving water. WLAs are determined in one of the following ways:

1. TMDL-based WLA
   Where the receiving water quality does not meet WQS (called an "impaired water"), the WLA may be 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 an impaired water body without causing the water body to exceed the criterion for that pollutant. The loading of a particular pollutant above the assimilative capacity of the impaired receiving water risks a violation of the state or tribes WQS for that pollutant.

   In order to ensure that the identified impaired waters will return to compliance with their applicable WQS, Section 303(d) of the CWA requires states to develop TMDLs for those water bodies that will not meet WQS even after the imposition of TBELs in point source permits. The first step in establishing a TMDL is to determine the assimilative capacity of the impaired water body. The next step is to divide the assimilative capacity among non-point sources, point sources, natural background loading, and a margin of safety to account for any uncertainties. Permit limitations are then developed consistent with the WLA for the point source.

   For more discussion on TMDLs and the WLAs used in the draft Permit, see Section III.D of this fact sheet.

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

3. Criterion as the Wasteload Allocation
   In some cases, a mixing zone cannot be authorized either because the receiving water meets or exceeds the criterion for the particular pollutant of concern, the receiving water flow is too low to provide dilution, regulations require a specific criterion, or the point source facility can achieve the effluent limit without a mixing zone. In such cases, the previously calculated criterion then becomes the WLA necessary to meet the state or tribe's WQS. Establishing the criterion as the WLA ensures

that the effluent discharge will not contribute to an exceedance that would violate the WQS. The WLAs for BOD_5, pH, and *E. coli* were derived using this method.

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

Summary - Water Quality-based Effluent Limits Not Discussed in Detail Previously

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

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

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

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

C. Anti-backsliding Provisions

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e.,

anti-backsliding) but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. water quality-based limits or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on technology-based effluent limits established using best professional judgment [i.e., based on Section 402(a)(1)(B)](WQBELs).

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). According to the EPA NPDES Permit Writers' Manual (EPA-833-K-10-001) the 402(o)(2) exceptions are applicable to WQBELs (except for 402(o)(2)(B)(ii) and 402(o)(2)(D)) and are independent of the requirements of 303(d)(4). Therefore, WQBELs may be relaxed as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied.

Even if the requirements of Sections 303(d)(4) or 402(o)(2) are satisfied, Section 402(o)(3) prohibits backsliding which would result in violations of WQS or effluent limit guidelines. An anti-backsliding analysis was done for the Star WWTP draft permit proposed today. As a result of the analysis, the limitations in the 1999 permit for BOD, TSS, and fecal coliform are not being retained in today's proposed permit, however the limits proposed today are more stringent than the limits in the 1999 permit. The anti-backsliding analysis for each limit or condition is discussed in more detail below.

BOD

The BOD limits in 1999, as well as the BOD percent removal requirements, were based on the equivalent to secondary treatment standards found at 40 CFR 133.105. The first criterion that a publicly owned treatment works (POTW) must meet, in order to be eligible for the equivalent to secondary treatment standards, is a demonstration that BOD and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the secondary treatment standards found at 40 CFR 133.102 (a) and (b). The second criterion that a POTW must meet in order to be eligible for the equivalent to secondary treatment standards is that its principal treatment process must be a trickling filter or waste stabilization pond/lagoon (i.e., the largest percentage of BOD and TSS removal is from a trickling filter or waste stabilization pond system). The third criterion that a POTW must meet in order to be eligible for the equivalent to secondary treatment standards is that the facility provides significant biological treatment of municipal wastewater. Regulations at 40 CFR 133.101(k) define "significant biological treatment" as using an aerobic or anaerobic biological treatment process to consistently achieve a 30-day average of at least 65% removal of BOD.

The City of Star is a growing community. The Star WWTP has upgraded and expanded in accordance with the design plans for the community over time. The Star WWTP is no longer eligible for limits in its permit at the equivalent to secondary treatment standards, because in 2006 the Star WWTP installed membrane bioreactor (MBR) technology into its treatment process, in addition to the lagoons that were previously in use. The Star no longer meets the second criterion explained above, as most of the BOD and TSS removal are now coming from the MBR technology instead of from the lagoons. Therefore, the technology-based limits for BOD proposed in today's draft permit have been revised to meet the secondary treatment standards found at 40 CFR 133.102. Today's average monthly and average weekly limits for BOD are more stringent than what was in the 1999 permit. In addition, the percent removal

required for BOD has also gotten more stringent because the equivalent to secondary treatment standards no longer apply to the Star WWTP. The limit for BOD removal has increased from 65% removal to 85% removal with the application of the secondary treatment standards at 40 CFR 133.102.

The average monthly and average weekly limits for BOD in pounds per day (lbs/day); however, are less stringent than what was included in the 1999 permit. That is because the lbs/day limits for BOD are calculated based on the design flow of the facility, which is currently 1.85 mgd. In 1999, the design flow of the Star WWTP used in the mass-based BOD and TSS calculations was 0.33 mgd. And, as previously explained above, the Star WWTP has expanded and upgraded since 1999, with the additional population in the City of Star and the expectation of further growth into the future, the MBR technology was installed in 2006 and the design flow for the facility increased to 1.85 mgd. The change in the mass-based limits for BOD for the Star WWTP is therefore not backsliding, the design flow for the facility has simply increased over time.

TSS

The TSS limits in the 1999 permit were also written to the equivalent to secondary treatment standards, and as explained above, the Star WWTP no longer meets the second criterion for eligibility for the equivalent to secondary treatment standards. Therefore, in today's draft permit, the proposed technology-based limits for TSS have been revised to meet the secondary treatment standards found at 40 CFR 133.102. Today's average monthly and average weekly limits for TSS are more stringent than what was in the 1999 permit.

In addition, the mass-based limit for TSS in lbs/day was absent from the 1999 permit. This mass-based limit for TSS is included in today's draft permit because of the wasteload allocation (WLA) for TSS provided to the Star WWTP in the 1998 Lower Boise TMDL. There is no backsliding on the TSS limits, as in both cases (concentration based and mass based limits) the limits have gotten more stringent since 1999.

Fecal Coliform

As discussed earlier in this fact sheet in Section III.D, the fecal coliform limits that were in the 1999 permit no longer apply because the State of Idaho WQS for bacteria changed from fecal coliform to *E. coli*. Therefore the *E. coli* criteria must be met at the point of the Star WWTP discharge and the numeric *E. coli* criterion is proposed here as the limit for bacteria in the discharge. There is no backsliding on the bacteria criteria, as the State of Idaho WQS for bacteria have changed over time, but the draft Permit complies with the WQS for bacteria.

D. Antidegradation

The proposed issuance of an NPDES permit triggers the need to ensure that the conditions in the permit ensure that Tier I, II, and III of the State's antidegradation policy are met. An anti-degradation analysis was conducted by the IDEQ as part of their CWA § 401 certification review.

E. Facility Specific Limits

The final limits are the most stringent of any technology treatment requirements, water quality based limits, or limits retained as the result of anti-backsliding analysis or to meet the State's anti-degradation policy. See Table 7 of this fact sheet, above for the proposed effluent limits for the Star WWTP.

Appendix F: Water Quality-Based Effluent Limit Calculations

A. RPA

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine RP. In order to determine if there is RP 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 RP, and a water quality-based effluent limit must be included in the permit. The following section discusses how the maximum projected receiving water concentration is determined.

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

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

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

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

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:

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

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is the 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 RP and calculate wasteload allocations.

C. Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's TSD (1991) recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see Equation 3, above). In order 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 the 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.

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

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

and

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

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:

$$C_e = (RPM)(MRC) \qquad \text{Equation 10}$$

where MRC = Maximum Reported Concentration

D. 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.

Table 14. Spreadsheet Showing Reasonable Potential Calculations for Ammonia and TRC

Reasonable Potential Calculation

Facility:	City of Star WWTP
Water Body Type	Freshwater

Water Designation		Low Flow	(IDAPA 58.01.02 03.b)
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	USING 4 cfs Canal Flow from S. Middleton Data &2.9 design flow	1.1	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)		1.1	7Q10 or 4B3
Ammonia		1.1	30B3 or 30Q10
Human Health - Non-Carcinogen		1.4	30Q5
Humn Health - carcinogen		1.4	Harmonic Mean Flow

	Low Flow	Notes:
Receiving Water Hardness = 42 mg/L		
Receiving Water Temp, °C	19.6	95th percentile
Receiving Water pH	6.9	95th percentile

Pollutant			AMMONIA, Criteria as Total NH3	CHLORINE (Total Residual)
Effluent Data	# of Samples (n)		90	62
	Coeff of Variation (Cv)		1.39	0.681
	Effluent Concentration, µg/L (Max. or 95th Percentile)		14,900	4330
	Calculated 50th percentile Effluent Conc. (when n>10)			
Mizing Zone Used (DF from first tab)	Aquatic Life - Acute		1.1	1.1
	Aquatice Life - Chronic			1.1
	Ammonia		1.1	
	Human Health - Non-Carcinogen			1.4
	Humn Health - carcinogen			1.4
Receiving Water Data	90th Percentile Conc., µg/L		0.00	0.00
	Geo Mean, µg/L			
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	26,150	19
		Chronic	4,409	11
	Human Health Water and Organism, µg/L		-	-
	Human Health, Organism Only, µg/L		-	-
	Metal Criteria Translator, decimal	Acute	-	-
		Chronic	-	-
	Carcinogen?		N	N

Aquatic Life Reasonable Potential

σ	$\sigma 2=\ln(CV^2+1)$		1.037	0.617
Pn	$=(1\text{-confidence level})^{1/n}$	99%	0.950	0.928
Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	2.0	1.7
Max. conc.(ug/L) at		Acute	27,519.208	6725.1
		Chronic	27,519.208	6725.1
Reasonable Potential? Limit Required?			**YES**	**YES**

E. Reasonable Potential

The discharge has the RP 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. It was determined that the discharge of total ammonia and TRC from the Star WWTP has the RP to cause or contribute to exceedances of the water quality criteria for those pollutants at the point of discharge from the Star WWTP into the Lawrence-Kennedy (LK) Canal.

F. WQBEL Calculations

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The WQBELs for total ammonia and TRC are intended to protect aquatic life criteria. The following discussion presents the general equations used to calculate the WQBELs. The calculations for all WQBELs based on aquatic life criteria are summarized in the figure below.

G. 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 RPA (Equation 3 above). 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.

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

Equation 12 is rearranged to solve for the WLA, becoming:

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

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 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 (LTA_c) 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.

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 in NPDES permits be expressed in terms of total recoverable metal. Therefore, EPA must calculate a wasteload allocation for metals in total recoverable terms that will be protective of the regulatory criterion (expressed as dissolved). This is accomplished by dividing the WLA, expressed as dissolved, by a metals criteria translator.

H. 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 13. Final Effluent Limit Calculations for Total Ammonia and TRC

			Ammonia	Chlorine
n = # samples assumed to calculate AML			30	4
# of Compliance Samples Expected per month			**4**	**4**
LTA Coefficient of Variation. (CV), decimal	default = 0.6 or calculate from data		1.39	0.681
Permit Limit Coeff. Var. (CV), decimal			1.39	0.681
Waste Load Allocations, ug/L	$C_d=(C_r x MZ_a)-C_{sa} x(MZ_a-1)$	Acute	28,663	20.83
	$C_d=(C_r x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic	4,833	12.06
Long Term Averages, ug/L	WLAc x exp(0.5σ²-2.326σ)	Acute	4,397	6.00
	WLAa x exp(0.5σ²-2.326σ); ammonia n=30	Chronic	2,788	5.90
Limiting LTA, ug/L	used as basis for limits calculation		2,788	5.90
Metal Translator or 1?			1.00	1.00
Average Monthly Limit (AML), ug/L		95%	4076	**10**
Maximum Daily Limit (MDL), ug/L		99%	18182	**20**
Average Monthly Limit (AML), mg/L			4.1	0.010
Maximum Daily Limit (MDL), mg/L			18.2	0.020

Average Monthly Limit (AML), lb/day	63	**0.15**
Maximum Daily Limit (MDL), lb/day	281	**0.32**

Appendix G: Total Phosphorus Reasonable Potential, Best Management Practices, and Water Quality-Based Effluent Limit Calculations

A. Overview

As explained below, the EPA has determined that the discharge of total phosphorus (TP) from the Star wastewater treatment plant (WWTP) has the RP to cause or contribute to violations of Idaho's water quality criteria for nutrients from May – September. Therefore, WQBELs for TP are proposed for this season.

B. Applicable Water Quality Criteria

The State of Idaho has a narrative water quality criterion for nutrients which reads, "Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses." Where a State or Tribe has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the RP to cause, or contributes to an excursion above a narrative criterion within an applicable State or Tribal WQS, the permitting authority must establish effluent limits using one or more of the options provided in 40 CFR 122.44(d)(1)(vi).

Interpretation of Narrative Criterion

Limiting Nutrient
Both nitrogen and phosphorus can contribute to violations of the State of Idaho's WQS that result from excess nutrients (i.e., Idaho has criteria for nuisance algae, DO, and pH to protect designated uses, one of which is aesthetics). Liebig's Law of the Minimum states that the nutrient that is less abundant relative to the biological requirements of algae is the limiting nutrient (i.e., the nutrient that controls primary productivity) (EPA *Glossary of Aquatic Ecological Terms*, 1972). Phosphorus is generally the limiting nutrient in freshwaters. This is because blue-green algae can "fix" elemental nitrogen from the air as a nutrient source or utilize nitrogen in the water column at very low concentrations and thereby grow in a low-nitrogen environment (EPA *Protocol for Developing Nutrient TMDLs*, 1999).

The Snake River Hells Canyon (SR-HC) TMDL concluded that phosphorus is the more likely limiting nutrient in the Snake River, downstream from the Boise River. The TMDL establishes targets and allocations for total phosphorus. The target concentration of TP at the mouth of the Boise River is 70 µg/LTP.

<u>May – September</u>
The EPA has determined that the TP concentration of 70 µg/L from the SR-HC TMDL is the appropriate value to interpret Idaho's narrative criterion for nutrients for the purposes of determining RP and, if necessary, for calculating effluent limits for TP. This interpretation of the narrative nutrient criterion is valid from May – September, which is the period of time during which the SR-HC TMDL establishes in-stream targets and allocations for TP.

The EPA believes that this concentration is reasonable because the concentration is below EPA's effects based criterion of 0.1 mg/L from *Quality Criteria for Water 1986* and falls within the

range of acceptable concentrations for the control of periphyton cited in the EPA's *Nutrient Criteria Technical Guidance Manual, Rivers and Streams*. The analysis that IDEQ performed for the TMDL demonstrated that beneficial uses in the Snake River could be restored if the concentration of phosphorus at the mouth of the Boise River was less than or equal to 70 µg/L. Therefore, the EPA believes 70 µg/L of phosphorus will be protective of both the Boise River and the Snake River from May – September.

In addition to the magnitude (numeric value) of the criterion, water quality criteria may include an averaging period and an allowable excursion frequency as well. On page 297, the SR-HC TMDL states that the average chlorophyll a target of 0.14 mg/L corresponds to a maximum total phosphorus concentration of 0.07 mg/L. The executive summary (on page "w") states that the target for total phosphorus is "a maximum of 0.07 mg/L total phosphorus instream". The EPA has therefore used the 70 µg/L maximum target from the Snake River Hells Canyon TMDL to interpret the State of Idaho's narrative criterion for nutrients, consistent with 40 CFR 122.44(d)(1)(vi)(A).

<u>October – April</u>
The SR-HC TMDL does not establish nutrient targets or allocations for the October – April period. It is not feasible to calculate numeric effluent phosphorus limits for October-April for one point source in a complex watershed in the absence of a comprehensive watershed analysis and evaluation of all contributing sources. Therefore, the EPA plans to defer establishing any potential effluent limits for nutrients for October- April in the Star WWTP permit until a TMDL for the Boise River is complete.

C. Basis for May – September TP Effluent Limits

Ambient Concentration
Federal regulations require that RPAs use procedures which account for existing controls on point and nonpoint sources of pollution (40 CFR 122.44(d)(1)(ii)). Existing controls on point and nonpoint sources of pollution are accounted for by considering the upstream concentration of the pollutant of concern in the RPA.
In addition to reviewing the effluent concentration data on TP from 2006-2013 provided by the Star WWTP, the EPA also reviewed the available data on phosphorus monitoring at USGS sites generally upstream and downstream from the Star WWTP. The data was available from the USGS National Water Information System (NWIS) online at
http://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=132108247 (downstream site)
http://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=13206300
http://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=13208600 (upstream sites)

Summary statistics of the upstream and downstream total phosphorus concentrations are shown in the following table.

Table 14. Upstream and Downstream TP Concentrations in µg/L

Upstream		Downstream	
Minimum	60	Minimum	120
Average	124	Average	205
Maximum	280	Maximum	300
Count (# of data points)	9	Count (# of data points)	43
Standard Deviation	79	Standard Deviation	39

The minimum TP concentration measured upstream from the discharge is 60 µg/L (from 2 out of 8 data points), and the average upstream TP concentration is 124 µg/L (from all 9 data points), which is higher than the 70 µg/L interpretation of Idaho's narrative criterion for nutrients. Therefore, the Boise River, which provides the water to the Lawrence-Kennedy canal system upstream of Star, cannot provide dilution of the Star WWTP's discharge of phosphorus downstream, and the 70 µg/L effluent limit interpretation of Idaho's narrative nutrient criterion must be applied at the end-of-pipe, without allowing for dilution (i.e., no mixing zone). The data is shown also in the table below.

Table 15. TP Data from the USGS NWIS; Upstream and Downstream of Star WWTP

UPSTREAM DATA			DOWNSTREAM DATA		
Date	Phos Conc mg/L	ug/L	Date	Phos Conc mg/L	ug/L
8/21/2012	0.06		5/3/1994	0.20	
10/29/2012	0.06		11/15/1994	0.19	
3/4/2013	0.09		5/12/1995	0.15	
8/20/2012	0.18		12/5/1995	0.23	
10/30/2012	0.21		5/13/1996	0.27	
3/5/2013	0.28		6/10/1997	0.15	
8/20/2012	0.08		7/15/1997	0.23	
10/29/2012	0.08		8/12/1997	0.23	
3/4/2013	0.08		12/18/1997	0.20	
Average	0.124	124	5/11/1998	0.18	
Minimum	0.060	60	5/11/1998	0.17	
Maximum	0.280	280	8/19/1998	0.24	
Count	9		4/19/1999	0.30	
Std Dev	0.079	79	5/5/1999	0.15	
CV	0.635		5/18/1999	0.20	
95th Percentile	0.252	252	6/10/1999	0.20	
5th Percentile	0.060	60	6/22/1999	0.22	
			7/7/1999	0.20	
			7/20/1999	0.20	
			8/4/1999	0.25	
			8/30/1999	0.25	
			9/15/1999	0.16	
			9/28/1999	0.14	
			10/25/1999	0.12	
			11/15/1999	0.22	
			12/13/1999	0.21	
			1/10/2000	0.25	
			2/15/2000	0.22	
			3/14/2000	0.18	
			3/14/2000	0.17	
			5/18/2000	0.17	
			8/27/2001	0.20	
			5/4/2005	0.26	
			5/4/2005	0.27	
			6/8/2005	0.18	
			6/8/2005	0.20	
			7/7/2005	0.22	
			7/7/2005	0.22	
			8/10/2005	0.23	
			8/10/2005	0.23	
			8/21/2012	0.19	
			10/30/2012	0.20	
			3/5/2013	0.16	
			Average	0.205	205
			Minimum	0.120	120
			Maximum	0.300	300
			Count	43	
			Std Dev	0.039	39
			CV	0.189	
			95th Percentile	0.269	269
			5th Percentile	0.150	150

The average concentration of total phosphorus downstream from the discharge is higher than the average concentration upstream from the discharge. This suggests the discharges from Star and other facilities downstream are contributing to the higher TP concentrations in the Boise River. All NPDES permitted facilities in the Lower Boise River watershed are expected, or going to be expected, to implement the 70 µg/L WLA in the TMDL until such time as there is an EPA-approved TP TMDL for the Lower Boise River watershed.

Dilution
RP analyses may account for the dilution of the effluent in the receiving water, where appropriate (40 CFR 122.44(d)(1)(ii)). However, as explained above, because the upstream concentration of TP is consistently higher than the interpretation of Idaho's narrative criterion for nutrients, dilution may not be considered in this case.

Effluent TP Concentration
The EPA also reviewed the data collected by the Star WWTP and submitted in July 2013 in order for the EPA to evaluate the current phosphorus removal capability of the Star WWTP.

The supplemental data provided by the facility and evaluated by the EPA shows that the average TP concentration, measured 82 times from 2006-2013 was 2260 µg/L with a minimum concentration during that time period of 330 µg/L and a maximum concentration of 6020 µg/L. The 95th percentile of this effluent data is 4460 µg/L. See Figure 8 of this fact sheet for the graph of the facility's TP concentrations as measured 2006-2013.

Reasonable Potential Finding
Because dilution cannot be considered in this case and the effluent concentration of TP is greater than the 70 µg/L interpretation of the narrative criterion, the discharge has the RP to cause or contribute to excursions above WQS for nutrients. Therefore, the EPA must establish effluent limits for TP in the permit [40 CFR 122.44(d)(1)(i – iii)] based on the HC-SR TMDL, as previously discussed.

D. Effluent Limits

Wasteload Allocation

According to Section 6.2.1.2 of the 2010 *U.S. EPA Permit Writers' Manual* and Section 5.4 of the TSD, WLAs need not be established by a TMDL, but may instead be calculated for an individual point source as part of the permitting process.

Because dilution may not be considered in this case due to high concentrations of TP upstream from the discharge, the WLA is equal to the interpreted narrative criterion.

$$C_e = WLA = C_d = 70\ \mu g/L$$

Translating the Wasteload Allocation to Effluent Limits

NPDES regulations at 40 CFR 122.45(f) require effluent limits in NPDES permits to be expressed in terms of mass, and states that "pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the Permittee to comply with both limitations." Section 5.7.1 of the TSD states that the EPA "recommends that

permit limits on both mass and concentration be specified for effluents discharging into waters with less than 100 fold dilution." Because dilution cannot be considered in this case, the EPA has established TP limits on both mass and concentration.

NPDES regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as AMLs and AWLs unless impracticable. The EPA has set the AML equal to the 70 µg/L TP WLA. This means the effluent concentration of TP could be greater than 70 µg/L for short periods of time within a calendar month, but such excursions will be of such a short duration and small magnitude that they will be negligible in terms of their effect on phosphorus concentrations in the Boise and Snake Rivers.

Consistent with 40 CFR 122.45(d)(2), The EPA has also established an AWL for TP, in addition to the AML. AWLs for TP were calculated by adapting the ratio shown in Table 5-3 of the TSD to an AWL instead of a MDL, using the required sampling frequency of once per week, the 95th percentile probability basis for the average monthly limit, and the 99th percentile probability basis for the AWL. Attainment of the proposed AMLs for TP will require upgrades to the POTW. Therefore, the historic effluent variability for TP may not be representative of future effluent variability. Accordingly, the EPA has assumed that the CV is equal to 0.6, consistent with the recommendation of the TSD when effluent data are not available (see TSD at Page E-3). This results in a ratio between the average monthly and average weekly limit of 2.01:1. Therefore, the average weekly limit is 141 µg/L (70 µg/L × 2.01 = 141 µg/L).

<u>Mass Limits</u>
Mass limits are calculated from the concentration limits discussed above, using the design flow of the POTW, consistent with 40 CFR 122.45(b)(1). The average monthly and average weekly mass limits for TP for the Star WWTP are as follows:

Average Monthly Limits

0.07 mg/L × 1.85 mgd × 8.34 lb/gallon = 1.1 lbs/day

Average Weekly Limits

0.141 mg/L × 1.85 mgd × 8.34 lb/gallon = 2.2 lbs/day

Appendix H: Draft Clean Water Act Section 401 Certification from the Idaho Department of Environmental Quality

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
Curt Fransen, Director

April 23, 2014

Mr. Michael J. Lidgard
NPDES Permits Unit Manager
EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Subject: DRAFT 401 Water Quality Certification for the Star Sewer and Water District WWTF, ID-0023591

Dear Mr. Lidgard:

The Boise Regional Office of the Department of Environmental Quality (DEQ) has reviewed the above-referenced permit for the Star Sewer and Water District. Section 401 of the Clean Water Act requires that states issue certifications for activities which are authorized by a federal permit and which may result in the discharge to surface waters. In Idaho, DEQ is responsible for reviewing these activities and evaluating whether the activity will comply with Idaho's Water Quality Standards, including any applicable water quality management plans (e.g., total maximum daily loads). A federal discharge permit cannot be issued until DEQ has provided certification or waived certification either expressively, or by taking no action.

This letter is to inform you that DEQ is issuing the attached draft 401 certification subject to the terms and conditions contained therein. DEQ is requesting the following changes to the permit to ensure consistency with the Lower Boise River TMDL, other permits in the watershed and our water quality standards:

1. DEQ revised the Lower Boise River TMDL TSS allocation for the Star Sewer and Water District WWTP to include a portion of the sediment reserve for growth. Please see attached request and approval letters and adjust the mass-based limits in the permit to 463 lbs/day monthly average and 694 lbs/day weekly average.
2. Removal of permit limits developed to support cold water aquatic life in Lawrence-Kennedy canal (IDAPA 58.01.02.101.02), unless the limits are necessary to support beneficial uses in Mill Slough or the Boise River.

3. Additional reporting requirement under item 4 (b) in the compliance schedule section (I.C.) of the draft permit.
    a. Any exceedances of interim permit limits or anticipated challenges for compliance within the next year. This may include a technological explanation of why the interim limit is no longer appropriate and a request to modify the permit.
4. Addition to Task 1 in the compliance schedule section of the draft permit
    a. Options to meet final phosphorus limit could include: pollutant trading, offsets, chemical treatment, biological treatment, and any other options available at the time of the facility planning study.
5. Extend the schedule of submission of the draft permit QAP, O&M, Emergency Response and Public Notification Plans from 90 to 180 days to be consistent with requirements in other permits in the watershed.
6. Provide until March 15, 2015 to implement continuous flow monitoring in Lawrence-Kennedy Canal, which is required in section I.E. of the draft permit. Construction of the weir for flow monitoring is only allowed from November 1 through March 15th on this private, man-made water body.

Please contact me directly at (208) 373-0277 to discuss any questions or concerns regarding the content of this certification.

Sincerely,

Pete Wagner
Regional Administrator
Boise Regional Office

c: Jill Nogi, EPA Region 10
Miranda Adams, DEQ State Office

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

April 23, 2014

NPDES Permit Number(s): ID-002359-1 Star Sewer and Water District Wastewater Treatment Plant (WWTP)

Receiving Water Body: Lawrence-Kennedy Canal

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, including without limitation, the approval from the owner of a private water conveyance system, if one is required, to use the system in connection with the permitted activities.

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 Star Sewer and Water District WWTP discharges the following pollutants of concern: BOD_5, TSS, *E. coli*, ammonia, chlorine, total phosphorus, temperature, chloroform, zinc, and copper. Effluent limits have been developed for BOD_5, TSS, *E. coli*, ammonia, chlorine, and total phosphorus. Due to lack of temperature, chloroform, zinc and copper effluent data, monitoring requirements are included so that reasonable potential to exceed WQS can be determined in future permits.

Receiving Water Body Level of Protection

The Star Sewer and Water District WWTP discharges to the Lawrence-Kennedy Canal within the Lower Boise Subbasin. Lawrence-Kennedy Canal is a man-made waterway, not designated in sections 110 through 160 of the WQS which delivers water from the Boise River to irrigate agricultural land to the west of the City of Star. Man-made waterways, for which uses are not designated in IDAPA 58.01.02, sections 110-160, are to be protected for the uses for which they were developed; in this case, agricultural water supply (IDAPA 58.01.02.101.02).

Water from the Lawrence-Kennedy (LK) Canal enters Mill Slough (AU 17050114SW005_02) just before it converges with the Boise River approximately seven (7) miles to the west of the facility near the City of Middleton. During the irrigation season, approximately May–September, water from LK Canal is applied to agricultural land, with any overflow going to various agricultural drains that enter Mill Slough or the Boise River. From October through April, water runs in LK Canal for approximately 7 miles, then discharges to South Middleton Drain and/or Watkins Drain, and then to Mill Slough.

Because no aquatic life or recreational uses are designated for the Lawrence-Kennedy Canal, DEQ will provide Tier 1 protection only for the Lawrence-Kennedy Canal (IDAPA 58.01.02.051.01).

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 Star Sewer and Water District WWTP 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.

The Boise River, at the point where Mill Slough meets it (AU 17050114SW005_06b), is impaired for sediment, bacteria, TP, and temperature. The EPA-approved *Lower Boise River TMDL* (DEQ 1999) establishes load allocations for sediment and bacteria at the mouth of Mill Slough and also wasteload allocations for sediment and bacteria for the Star Sewer and Water District WWTP. In accordance with the procedure outlined in the sediment TMDL, the Star Sewer and Water District requested an increase in their wasteload allocation from the sediment TMDL Reserve for Growth. Their design flow has increased from 0.33 million gallons per day (MGD) at the time of TMDL development to 1.85 MGD. DEQ has approved the requested wasteload allocation increase and has adjusted the remaining reserve for growth accordingly. These allocations are designed to ensure the Boise River will achieve the water quality necessary to support its existing and designated aquatic life beneficial uses and comply with the applicable numeric and narrative criteria. The effluent limitations and associated requirements contained in the Star Sewer and Water District WWTP permit are set at levels that comply with these wasteload allocations.

The Boise River, downstream from the City of Middleton, is impaired for TP. The *Snake River Hells Canyon* (SR-HC) *TMDL* (DEQ 2003) established a load allocation for the Boise River based upon a total phosphorus concentration of 0.07 mg/L at the mouth of the Boise River. The Lower Boise Watershed Council and DEQ (2008) developed the *Lower Boise Implementation Plan Total Phosphorus* (Implementation Plan), which implements the SR-HC TMDL for the Lower Boise watershed and assigns wasteload allocations to the point sources and load allocations to non-point sources in order to meet the target for total phosphorus set in the SR-HC TMDL. Since the SR-HC TMDL has been approved and implemented in the Lower Boise watershed through the Implementation Plan, the Star Sewer and Water District discharge must be consistent with the SR-HC TMDL and the Implementation Plan. A TMDL is under development to address TP impairment in the Lower Boise River. Once this TMDL is approved by EPA, DEQ expects wasteload allocations for the Star Sewer and Water District WWTP will be incorporated into their NPDES permit.

The draft NPDES permit allows the Star Sewer and Water District WWTP to discharge a monthly average of 1.1 lbs/day of phosphorus to the LK canal, and ultimately the Boise River from May-September. The Implementation Plan established a WLA in years 10-15 of implementation to the Star Sewer and Water District WWTF of 2.4 lbs/day (1.1 Kg/day), as a monthly average. The WLAs in the Implementation Plan allow the 0.07 mg/L TP target to be

met at the mouth of the Boise River in Parma, which would also allow the Boise River to meet its beneficial uses. The permit limit is more stringent than the target limit set forth in the Implementation Plan; therefore, DEQ believes the permit will ensure compliance with the TMDL and the applicable narrative criteria.

In sum, the effluent limitations and associated requirements contained in the Star Sewer and Water District WWTP permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the *Lower Boise River TMDL* and the *Snake River-Hells Canyon TMDL*. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Lawrence-Kennedy Canal in compliance with the Tier 1 provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

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

Alternative Limitations

The following subsection(s) discuss how the permit can be made less stringent and still comply with Idaho WQS.

Compliance with IDAPA 58.01.02.101.02 Protected Uses for Non-designated Man-made Waterways

The Star permit contains effluent limits to meet cold water aquatic life and recreational uses in the LK Canal, which is a man-made waterway. In order to include these limits, EPA relies upon the provision in the WQS, IDAPA 58.01.02.101.01, that generally applies to waters that are not specifically designated for uses in the WQS. The WQS, however, include a specific provision that addresses man-made waterways that is applicable to the LK Canal. In accordance with IDAPA 58.01.02.101.02, unless designated for other uses in the WQS, man-made waterways are to be protected for the use for which they were developed. The LK Canal is a man-made waterway developed to convey irrigation water for agricultural purposes. It is not designated for other uses in the WQS. Therefore, the LK Canal is not protected for aquatic life or recreational uses. As a result, the limits in the permit to protect aquatic life and recreational uses are not consistent with state law, and should be removed. This includes the following limits: chlorine and ammonia.

Compliance Schedules

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. Star Sewer and Water District WWTP cannot immediately achieve compliance with the effluent limits for total residual chlorine (chlorine), ammonia, and total phosphorus (TP). As set forth above, the chlorine and ammonia limits should be removed from the permit because these limits are intended to protect

aquatic life uses in the LK Canal. However, in the event they are not removed, 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.

1. The Star Sewer and Water District (Permittee) must achieve compliance with the final chlorine limitations of Part I.B.1. (Draft NPDES permit, Table 1), within three (3) years and eleven (11) months after the effective date of this permit. The Permittee must also achieve compliance with the final ammonia and TP limitations of Part I.B.I. (Draft NPDES permit, Table 1) within nine (9) years and eleven (11) months after the effective date of this permit.
2. While the schedules of compliance are in effect, the Permittee must comply with the following interim requirements:
   a) The Permittee must comply with the interim effluent limitations and monitoring requirements in Part I.B. of the draft permit.
   b) Until compliance with the chlorine, ammonia, and TP effluent limits are achieved, at a minimum, the Permittee must complete the tasks and reports listed in the Table 1 below, as required under the schedules of compliance.
3. The Permittee must provide written notification to the EPA and the DEQ within fourteen (14) days upon completion of each of the above-mentioned tasks at the addresses provided in Part III.J of the permit (also see Part III.K).
4. In addition, the Permittee must submit an annual progress report outlining progress made towards reaching the final compliance dates for the chlorine, ammonia, and TP effluent limitations. The annual report of progress must be submitted by ***insert date*** of each year. The first report is due ***insert date one year after effective date of permit*** and annually thereafter, until compliance with the chlorine, ammonia, and TP effluent limits is achieved. At a minimum, the written notice must include:
   a) An assessment of the previous year's chlorine, ammonia, and TP effluent data and comparison to the final effluent limitations in the permit.
   b) Any exceedances of interim permit limits or anticipated challenges for compliance within the next year. This may include a technological explanation of why the interim limit is no longer appropriate and a request to modify the permit.
   c) A report on progress made towards meeting the final effluent limitations, including the applicable deliverable required under Part I.C.2 of the permit.
   d) Further actions and milestones targeted for the upcoming year.

Table 1. Tasks Required Under the Schedules of Compliance

Tasks Required Under the Schedules of Compliance		
Task No.	Completion Date	Task Activity
1	__, 2016	Overall Planning Phase: The Permitee must complete an overall facility plan to comply with the final effluent limitations for total residual chlorine, total ammonia as N, and total phosphorus by the end of each parameter's compliance schedule. Options to meet final phosphorus limit could include: pollutant trading, offsets, chemical treatment, biological treatment, and any other options available at the time of the facility planning study. Deliverable: Permittee must provide a progress report to the EPA on facility planning, 14 days after ____ 2015 and written notice that the plan is complete 14 days after ___ 2016.
2	__, 2017	Design for Chlorine: The Permittee must complete the design for the reduction of total residual chlorine in the effluent. Deliverable: Permittee must provide EPA with written notice that the final design for the reduction of chlorine in the effluent is complete.
3	__, 2018	Construction Phase for Chlorine: The Permittee must have constructed the treatment upgrade for chlorine and must operate in compliance with the final effluent limitations for total residual chlorine. Deliverable: Permittee must achieve compliance with the final effluent limitations for chlorine immediately upon the completion date outlined in this compliance schedule and must send written notice of compliance to EPA.
4	____, 2019	Final Facility Design Phase: The Permittee will have completed the detailed design for the upgraded facility to meet the final total ammonia as N and total phosphorus limitations. Deliverable: Permittee must provide EPA with written notice that the final design report has been completed.
5	____, 2023	Final Facility Construction Phase: The Permittee will have completed the construction for the upgraded facility to meet the final total ammonia as N and total phosphorus limitations. Deliverable: Permittee must provide EPA with written notice that the facility construction has been completed.

Tasks Required Under the Schedules of Compliance		
Task No.	Completion Date	Task Activity
6	____, 2024	Achieve Final Effluent Limitation (nine years eleven months after the effective date of the permit) Deliverable: Permittee must achieve compliance with the final effluent limitations immediately upon the completion date outlined in this compliance schedule and must submit written notice of compliance to EPA.

Mixing Zones

As set forth above, the chlorine and ammonia limits should be removed from the permit because these limits are intended to protect aquatic life uses in the LK Canal. However, in the event they are not removed, DEQ authorizes a mixing zone as set forth below.

Pursuant to IDAPA 58.01.02.060, DEQ authorizes a mixing zone that utilizes 25% of the critical flow volumes of Lawrence-Kennedy Canal for ammonia and chlorine.

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 Lauri Monnot, DEQ Boise Regional Office at 208.373.0461 or Lauri.Monnot@deq.idaho.gov.

DRAFT

Pete Wagner
Regional Administrator
Boise Regional Office

KELLER associates
131 SW 5th Avenue, Suite A Meridian, ID 83642
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March 27, 2014

Ms. Lauri Monnot
Watershed Coordinator
DEQ Boise Regional Office
1445 N Orchard
Boise, ID 83706

Re: **Star Sewer and Water District, Idaho - TSS Reserve for Growth Load Allocation on Boise River – NPDES Preliminary Permit #ID-0023591**

Dear Ms. Monnot:

I am writing this letter as the Star Sewer and Water District (District) engineer. Please find this letter as a formal request for additional load allocation for the District for total dissolved solids (TSS) from the "Reserve for Growth" set aside in the *February 2009 Lower Boise River 5-Year Subbasin Assessment and TMDL Review*. The assumed design flow used in the TMDL calculations for the District was 0.33 MGD which reflected the design flow of the wastewater treatment plant (WWTP) prior to the MBR additions to the plant which occurred in 2006 and 2009 which increased the design flow for the WWTP to 1.85 MGD. Currently the District's average day flows are approximately 0.65 MGD or double the design flow assumed in the 2008 TMDL.

As you know EPA recently provided DEQ a preliminary draft NPDES permit for 401 certification. The TSS load limits proposed in the draft permit do not reflect the District's current design flow. Consequently, the District requests that DEQ allocate an additional 270 lbs/day for the average monthly limit and 404 lbs/day for the average weekly limit as allowed under the "Reserve for Growth" portion of the 2008 TMDL. The District understands and agrees to the condition that this additional load allocation will be granted on an interim basis until the District completes the improvements at the WWTP to abandon the wastewater lagoon treatment process planned in the next ten years at which point this additional load allocation will be returned to the "Reserve for Growth". If approved by DEQ, the new load limits in the NPDES permit would be 463 lbs/day and 694 lbs/day for the monthly and weekly average limits respectively.

This additional TSS load allocation will allow the District time to implement improvements at the WWTP to abandon the lagoons and reduce the TSS loads into the Boise River. Thank you for your consideration.

Sincerely,

KELLER ASSOCIATES, INC.

Justin Walker, P.E.
District Engineer

cc: Star Sewer and Water District
File

212009/Draft NPDES/14-107

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

April 7, 2014

Justin Walker
District Engineer – Star Sewer and Water
Keller Associates
131 SW 5th Avenue, Suite A
Meridian, ID 83642

Subject: Star Sewer and Water District – TSS Reserve for Growth Load Allocation for the Lower Boise River TMDL

Dear Mr. Walker:

The Boise Regional Office of the Department of Environmental Quality (DEQ) received a request from the Star Sewer and Water District to be granted a portion of the total suspended solids (TSS) reserve for growth allocation. This reserve was set aside in the *Sediment and Bacteria Allocations Addendum to the Lower Boise River TMDL* (2008).

On February 14, 2014, EPA requested 401 certification of a draft NPDES permit for the Star Sewer and Water District Wastewater Treatment Plant (WWTP). The draft permit includes a technology-based monthly average effluent limit of 30 mg/l TSS with a mass-based limit of 193 lbs/day from the *Lower Boise River TMDL* (1999). DEQ understands that the mass-based limit is no longer achievable since the design flow for the facility increased from 0.33 million gallons per day (MGD) in 1999 to 1.85 MGD in 2006. The facility upgrade that increased design flow also resulted in the ability of the facility to meet technology based effluent limits based on the secondary treatment regulations in 40 CFR 133. Therefore, it is appropriate to use the new design flow of 1.85 MGD and 30 mg/l monthly average and 45 mg/l weekly average concentrations to develop a wasteload allocation.

This letter is to inform you that DEQ is revising Table 15 of the *Sediment and Bacteria Allocations Addendum to the Lower Boise River TMDL* (2008) to allow Star a 463 lbs/day and 694lbs/day for the monthly average and weekly average limits, respectively. Additional revisions to this table change the design flow of Star's facility from 0.33 MGD to 1.85 MGD and monthly average permit limit for TSS from 70mg/l to 30 mg/l in Table 15. The resulting total remaining reserve for growth in the sediment TMDL will be 2.9 tons/day.

n t e o a c y c e d P a p e r

An additional requirement of the increased TSS wasteload allocation is that all or a portion of this allocation be returned to the reserve for growth after facility upgrades are completed and the system meets its final total phosphorus and ammonia effluent limits. It is our understanding that the current lagoon treatment system will be abandoned by the end of the 10 year total phosphorus and ammonia compliance schedules outlined in the draft permit. Determination of the portion of the reserve for growth allocation to be returned will be dependent upon the facility design flow and performance after facility upgrades.

Please contact Lauri Monnot at the DEQ Boise Regional Office at (208) 373-0277 to discuss any questions or concerns regarding the wasteload allocation.

Sincerely,

Barry N. Burnell

Barry N. Burnell
Water Quality Division Administrator

BNB:dls

c: Star Sewer and Water District
Pete Wagner, DEQ Boise Regional Office