# Fact Sheet

**NPDES Permit Number: ID-002178-4**
**Date:** April 9, 1999
**Public Notice Expiration Date:** May 10, 1999

## The U.S. Environmental Protection Agency (EPA) Plans To Reissue A Wastewater Discharge Permit To:

**City of Pocatello**
**Water Pollution Control Plant**
**10733 N. Rio Vista Road**
**Pocatello, ID 83201**

and requests the State of Idaho to certify this NPDES permit pursuant to 40 CFR Part 124.53.

**EPA Proposes NPDES Permit Reissuance.**

EPA proposes to reissue a *National Pollutant Discharge Elimination System* (NPDES) Permit to the City of Pocatello. The draft permit sets conditions on the discharge of pollutants from the Pocatello wastewater treatment plant to the Portneuf River. It also authorizes the facility to continue to use processed sewage sludge, called *biosolids*, as a fertilizer and soil amendment. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged, and places conditions on the use of biosolids.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge and current biosolids practices
- a listing of past and proposed effluent limitations, schedules of compliance, and other conditions
- a description of the discharge location and a map and description of the biosolids disposal or use locations
- and detailed technical material supporting the conditions in the permit

**Idaho State Certification.**

EPA requests the Idaho Department of Health and Welfare, Division of Environmental Quality (IDHW-DEQ) to certify the NPDES permit for the City of Pocatello, under section 401 of the Clean Water Act. The state provided preliminary comments prior to the Public Notice which have been incorporated or addressed into the fact sheet and draft permit..

**Public Comment.**
EPA will consider all substantive comments before issuing the final permit. Those wishing to comment on the draft permit may do so in writing by the expiration date of the Public Notice. A request for public hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

**Documents are Available for Review.**
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (See address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at www.epa.gov/r10earth/offices/water/npdes.htm.

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-1214 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The Fact Sheet and draft permit are also available at:

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

Idaho Division of Environmental Quality
Pocatello Regional Office
224 South Arthur
Pocatello, Idaho 83204

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## TECHNICAL INFORMATION

I. Applicant

City of Pocatello
Water Pollution Control Plant

Mailing Address:
P.O. Box 4169
Pocatello, ID 83205-4169

Facility Location:
10733 N. Rio Vista Road
Pocatello, ID 83201

NPDES Permit No.: ID-002178-4
Facility Contact: Brent Hokanson, Superintendent

II. Activity

The City of Pocatello owns and operates a wastewater treatment plant that treats domestic wastewater as well as industrial wastewater. The facility provides secondary treatment of wastewater prior to discharge to the Portneuf River. The facility is designed for an average annual flow of 12 million gallons per day (mgd). Currently, the average annual flow is approximately 7.6 mgd.

III. Receiving Water

A. Outfall location: The City of Pocatello wastewater treatment plant discharges its wastewater to the Portneuf River via outfall 001. Outfall 001 is located at latitude 42° 54' 58" and longitude 112° 31' 10".

B. Water Quality Standards: A state's water quality standards are composed of both use classifications, and numeric and/or narrative water quality criteria.

The first part of a state's water quality standard is a classification system for water bodies based on the expected beneficial uses of those water bodies. The Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 16.01.02.140.01.z.) protect the Portneuf River from Marsh Creek to the mouth of the river for the following use classifications: cold water biota, salmonid spawning, secondary contact recreation and agricultural water supply. This segment of the

Portneuf River is also designated as "protected for future use" for primary contact recreation.

The second part of a state's water quality standards is the water quality criteria deemed necessary to support the beneficial use classification of each water body. These criteria may be numeric or narrative.

The criteria that are necessary to protect cold water biota are found in:

- 40 CFR §131.36 (b)(1), columns B1, B2, and D2 (with the exception of the human health arsenic criteria),
- the human health criteria for arsenic is found in Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.250.02.a.iv., and
- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200.,16.01.02.250.02.a., and 16.01.02.250.02.c.

The criteria necessary to protect secondary contact recreation are found in:

- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200. and 16.01.02.250.01.b, and
- 40 CFR §131.36(b)(1), column D2 (with the exception of the human health criteria for arsenic).

The criteria necessary to protect for agricultural use is found in:

- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200. and 16.01.02.250.03.b.

The criteria necessary to protect for salmonid spawning is found in:

- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200. and 16.01.02.250.02.d.

A summary of the water quality criteria applicable to this segment of the Portneuf River are listed in Appendix A.

C. Water Quality-Limited Segment: A water quality-limited segment is any waterbody, or definable portion of a waterbody, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. The Portneuf River between the boundaries of Interstate 86 to the Fort Hall Reservation Boundary has been identified as a water quality-limited segment and has been listed for sediments, nutrients, bacteria, and oil and grease.

Section 303(d) of the Clean Water Act (CWA) requires States to develop a total maximum daily load (TMDL) management plan for water bodies determined to be

water quality limited. A TMDL documents the amount of a pollutant a waterbody can assimilate without violating a State's water quality standards and allocates that load capacity to known point sources and nonpoint sources. Idaho Division of Environmental Quality is developing a TMDL for the Portneuf River. When completed, this permit may be reopened to address conditions in the TMDL relative to the City of Pocatello facility. See "nutrients" section V.C.3.(j). Of this fact sheet for further discussion of the Portneuf River TMDL.

## IV. Description of Facility and Discharge

The City of Pocatello owns and operates the wastewater treatment facility which serves a combined population of approximately 60,000 residents of Pocatello and the adjacent community of Chubbuck. The treatment of the wastewater consists of grit separation, barscreening, primary clarification, secondary treatment by activated sludge with anaerobic selector for filamentous control, secondary clarification, chlorination then dechlorination with sulfur dioxide. Sewage sludge (biosolids) from the wastewater treatment facility is treated by anaerobic digestion and long term (one year) lagoon storage. Final disposal of biosolids is by land application to small grain crops. A portion of the final effluent discharge is diverted during the summer irrigation season to farmers which is then land applied to crops at agronomic rates. The volume of the discharge during the irrigation season is variable although the design of the land treatment system allows for a maximum flow of 6 mgd (a total of 174 million gallons were diverted during the 1997 irrigation season).

The wastewater treatment plant has a design flow of 12 mgd, and 5-day biological oxidation demand ($BOD_5$) and total suspended solids (TSS) removal rates of 85%. The actual average annual effluent flow is approximately 7.6 mgd.

A review of the discharge monitoring reports (DMRs) for the past five years shows the facility has been in compliance with the requirements of its existing NPDES permit limits.

## V. Basis for Permit Conditions

### A. General Approach

Sections 101, 301(b), 304, 308, 401, 402 and 405 of the Clean Water Act (CWA) provide the basis for the effluent limitations and other conditions in the draft permit. EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations in determining which conditions to include in the permit.

The CWA requires Publicly Owned Treatment Works (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. EPA developed "secondary treatment" regulations which are specified in 40 CFR Part 133. These technology-based limits apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD, TSS, and pH.

EPA may find, by analyzing the effect of a discharge on the receiving water, that technology-based permit limits are not sufficiently stringent to meet water quality standards. In such cases, EPA regulations at 40 CFR §122.44(d)(1) require the development of more stringent, water quality-based limits (WQBELs) designed to ensure that water quality standards are met. The proposed permit limits reflect whichever limits (technology-based or water quality-based) are more stringent.

Under section 308 of the CWA and 40 CFR §122.44(I), EPA must include monitoring requirements in the permit to determine compliance with effluent limitations. Effluent and ambient monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. 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.

B. Technology-Based Evaluation

1. $BOD_5$ and TSS Concentration Limitations. Secondary treatment standards are defined in the federal regulations at 40 CFR §133.102 (state regulations at IDAPA 16.01.02.420) as follows:

Table 1. BOD and TSS Concentration Limitations

| Parameter | Monthly Average | Weekly Average | Percent Removal |
|---|---|---|---|
| Biochemical Oxygen Demand ($BOD_{5)}$ | 30 mg/L | 45 mg/L | 85% |
| Total Suspended Solids (TSS) | 30 mg/L | 45 mg/L | 85% |

These effluent limitations are in the existing permit and will be retained in the draft permit.

2. $BOD_5$ and TSS Loading Limitations. In accordance with federal regulations (40 CFR § 122.45 (f)), the secondary treatment requirements must be expressed as mass-based limits using the design flow of the facility. In the existing permit, the loading limitations were based on the design flow of the facility (12 mgd) and the secondary treatment concentration limits cited previously, therefore, the loading limits from the existing permit will be retained in the proposed permit (12mgd x 30 mg/l x 8.34 conversion factor = 3000 lb/day and 12x45 mg/l x 8.34 = 4500 lbs/day).

3. pH. The technology-based pH limitation for POTW's is defined in the federal regulations 40 CFR §133.102. The pH of the effluent is required to be within the range of 6.0 to 9.0 standard units.

4. Fecal coliform bacteria. The technology-based fecal coliform bacteria limitation for POTW's is defined in Idaho's water quality standards (IDAPA 16.01.02.420.05.). Fecal coliform concentrations in secondary treated effluent must not exceed a geometric mean of 200/100 ml based on no more than one week's data and a minimum of five samples.

C. Water Quality-Based Evaluation

1. Statutory Basis for Water Quality-Based Limits. Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the CWA.

   The NPDES regulation (40 CFR § 122.44(d)(1)) implementing section 301 (b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause , or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality."

   The regulations require that this evaluation be made using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

   The regulations also address when whole effluent toxicity (WET) and chemical-specific limits are required. A WET limit is required whenever

the toxicity of the effluent has the reasonable potential to cause or contribute to an excursion above either a numeric or narrative standard for toxicity. The only exception is where chemical-specific limits will fully achieve the narrative standard.

2. Reasonable Potential Determination. When evaluating the effluent to determine if water quality based effluent limits (WQBELs) are needed based on chemical specific numeric criteria, a projection of the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern is made. If the projected concentration of the receiving water exceeds the applicable numeric criterion for a specific chemical, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standards, and a WQBEL is required.

   The effluent limits, in the existing permit, for pH, fecal coliform bacteria, and total residual chlorine were compared with water quality standards to determine whether more stringent limits were necessary. Additionally, the level of metals, whole effluent toxicity, temperature, dissolved oxygen, ammonia, and turbidity discharged by the wastewater treatment facility were compared with water quality standards to determine if effluent limits needed to be incorporated into the proposed permit to ensure compliance with water quality standards.

3. Derivation of Water Quality-Based Effluent Limit. In deriving the WQBELs, Region 10 applies the statistical permit limit derivation approach described in chapter 5 of the *Technical Support Document for Water Quality-Based Toxics Control* (March, 1991, hereafter referred to as the TSD). This approach takes into account effluent variability, sampling frequency, and the difference in time frames between the water quality standards and monthly average and daily maximum limits. In addition to the numeric water quality criteria and dilution values, EPA used the following values in deriving limits, using the formulas in the TSD.

| | |
|---|---|
| Probability value for long-term average calculation | 99% |
| Probability value for monthly average limit calculation | 95% |
| Probability value for daily maximum limit calculation | 99% |
| Coefficient of variation for parameters of concern | Variable, see Appendix B |
| Frequency of monitoring for parameters of concern | Variable, see Appendix C |

The limits which EPA is proposing in the draft permit for each parameter are discussed below.

(a) pH

The existing permit requires the pH of the effluent to be between 6.0 - 9.0 standard units. The state water quality standard for pH is 6.5 - 9.5 standard units for the protection of aquatic life (IDAPA 16.01.02250.02.i.). The technology requirement requires the pH to be between 6.0 to 9.0 (See Part V.B.3. of this fact sheet). As discussed previously, the permit will reflect the most stringent limitation between technology-based and water-quality based, therefore, the proposed permit will require the effluent pH to be between 6.5 - 9.0 standard units. The lower end of the range reflects the state requirement for the protection of water quality standards while the upper end of the range reflects the federal technology-based requirement of 9.0 standard units.

(b) Fecal Coliform Bacteria

The existing permit has a monthly limit of 100 colonies/100 ml and a weekly limit of 200 colonies/100 ml. The state water quality standards limit fecal coliform bacteria for waters protected for secondary contact recreation. Waters are not to contain fecal coliform bacteria in concentrations exceeding 800/100 ml at any time, and a geometric mean of 200/100 ml based on a minimum of 5 samples taken over a thirty day period (IDAPA 16.01.02.250.01.b.). As discussed previously, the technology-based requirement for fecal coliform bacteria states that the effluent must not exceed a weekly geometric mean of 200/100 ml based on one weeks data and a minimum of five samples.

The existing designated use classification protects this segment of the Portneuf River for secondary contact recreation, which is the basis of the water-quality permit limit for fecal coliform. This segment of the river has a future use designation for primary contact recreation. Due to this future use designation the State of Idaho DEQ recommends inclusion of primary contact recreation limitations for fecal coliform for the proposed permit (See letter to Mike Lidgard, EPA from Lynn VanEvery, ID DEQ, March 9, 1999). For primary contact recreation, waters are not to contain fecal coliform bacteria in concentrations exceeding 500/100 ml at any time, and a geometric mean of 50/100 ml based on a minimum of 5 samples taken over a thirty day period, for the time between May 1 and September 30 of each calendar year. The state may require the primary contact recreation limits in the permit through the CWA Section 401(a)(1) certification

process. The final permit must include the more stringent limits provided they are required and justified in the state's final certification (See 40 CFR § 124.53)

The proposed permit incorporates the weekly fecal coliform bacteria limit of 200/100 ml (technology-based). In order to comply with Idaho water quality standards, a maximum daily limit of 800/100 ml, and an average monthly limit of 200/100 ml will also be incorporated into the proposed permit. For the period of May 1 through September 30, a maximum daily limit of 500/100 ml, and an average monthly limit of 50/100 ml shall also be included in the proposed permit. Should DEQ not include the primary contact recreation based fecal coliform limits in the final CWA section 401 certification, the final permit would not include the more stringent limits for May through September.

During the term of this permit the State of Idaho intends to change the bacteria criteria for contact recreation to *E. coli*. As such, the State has recommended that the effluent be monitored for *E. coli* bacteria. The State recommends bi-weekly monitoring, however, the draft permit will require once per week monitoring for *E. coli* bacteria in order to be consistent with the monitoring frequency established for other parameters.

(c) Total Residual Chlorine

The existing permit has a maximum daily limit of 0.5 mg/L. A reasonable potential analysis indicates that the current discharge has the potential to violate the state water quality standards (See Appendix B). The proposed permit will include an average monthly limit of 25 µg/L (2.5 lbs/day) and a maximum daily limit of 58 µg/L (5.8 lbs/day). For additional information on developing the effluent limitation, see Appendix C.

The water quality based effluent limits for chlorine fall below the level at which chlorine can be accurately quantified using EPA analytical test methods. The analytical method required by the permit achieves a method detection limit of 10 µg/L for chlorine. The method detection limit is the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The "minimum level" is used in permits when the limitation is below or near the detection limit. The minimum level is defined as the lowest concentration that gives quantifiable results at an acceptable calibration point. The minimum level for chlorine is 100 µg/L. In this case, the limitations are less than the minimum level but greater than the detection limit. When the limitation is below the minimum level EPA Region 10 follows the policy

that the minimum level is established as the compliance evaluation level for use in reporting Discharge Monitoring Report (DMR) data. EPA will consider the permittee in compliance with the water quality based effluent limits for chlorine provided the effluent does not exceed the minimum level of 100 µg/L. The actual water quality-based limitations are included in the limitations table of the permit but a footnote reflects the use of the minimum level as the compliance level.

(d) Total Ammonia

The existing permit does not contain effluent limitations for ammonia but does include ammonia effluent monitoring. The fact sheet accompanying the existing permit found that under certain conditions the facility does contribute to exceedances of the ammonia water quality criteria, however, the fact sheet stated that actual cases of stream toxicity had not been reported. In place of an effluent limit the permit established a condition requiring the city to conduct a basic water quality monitoring study and an assessment of the Portneuf River. The assessment included ambient ammonia monitoring in the Portneuf River both above and below the outfall, concurrent with ammonia effluent monitoring. The City of Pocatello assessment study of the Portneuf River (Assessment of Possible Effects of Pocatello's Treated Wastewater on the Biology and Chemistry of the Portneuf River, November 1989) did find that un-ionized ammonia exceeded the water quality criteria for samples collected within the effluent plume during some days during the study period. Further discussion of the results of the assessment study can be found in section V.C.1.g., toxic substances.

A reasonable potential analysis was conducted by EPA for this permit reissuance in order to determine whether the facility's discharge contributes to or causes exceedances of the State's ammonia water quality criteria. The following assumptions were used:

- pH = 7.4 standard units
- temperature = 17°C
- Portneuf flow = 175 cfs
- acute criterion = 13.78 mg/L (total ammonia)
- chronic criterion = 1.9 mg/L (total ammonia)
- allow a 25% mixing zone
- Pocatello design flow = 18.6 cfs
- background concentration = 0.5 mg/L.

The pH, temperature, flow, and background concentration data above were all taken from the City of Pocatello Portneuf River assessment study. The assessment study data was used over other potential data sources, such as USGS data, due to the fact that the assessment study gathered data immediately upstream and immediately downstream of the facility. The location of data collection sites is particularly important in analysis of the Pocatello facility due to the numerous springs that enter the river in the vicinity of the facility and their influence on receiving water quality. The pH and temperature values represent the highest measured value during the assessment study and are used in determining the acute and chronic ammonia criteria for the Portneuf River. The background ammonia was also the highest value measured upstream of the facility during the study period. Further discussion of the input parameters including river flow assumptions can be found in Appendix B.

Using these assumptions it was found that the existing discharge does have a reasonable potential to cause exceedances of the acute and chronic criteria (See Appendix B). Therefore, water quality-based effluent limitations (WQBELs) were calculated for ammonia. An average monthly limit of 4.4 mg/L (440 lbs/day) and a maximum daily limit of 8.1 mg/l (810 lbs/day) will be incorporated into the proposed permit (See Appendix C for derivation of limitations).

The average effluent concentration of ammonia over the last two years is roughly 20 mg/L which is considerably higher than the limitations included in the draft permit. This facility will most likely need to construct treatment capability in order to meet the ammonia limitations and, therefore, a schedule of compliance has been established and incorporated into the permit. The schedule of compliance will require the facility to come into compliance with the final limit before the end of the 5-year term of the permit.

Federal requirements for schedules of compliance are specified under 40 CFR 12.47 and State of Idaho requirements are found at IDAPA 16.01.02.400. Anticipating a permit effective date of May-June 1999 and, therefore, a permit expiration date of May-June 2004, a final compliance date of January 1, 2004, has been preselected. The January date will allow six months of compliance with the new limitations prior to permit expiration. The draft permit will also require the city to develop a more complete schedule of compliance for approval by Idaho DEQ. The complete schedule of compliance shall include major milestones which outline how the facility will reach the January 1, 2004 date. Additionally, the facility shall submit a report to EPA and the Idaho DEQ in January of

each year which outlines the progress made towards reaching the final compliance date.

(e) Dissolved Oxygen/Biochemical Oxygen Demand (BOD)

The State water quality standards requires the level of dissolved oxygen (DO) to exceed 6.0 mg/L at all times for water bodies that are protected for aquatic life use. For water protected for salmonid spawning, the criterion is a one day minimum of not less than 6.0 mg/L or 90% of saturation, whichever is greater.

BOD is a measure of the amount of oxygen required to stabilize organic matter in wastewater. It measures the total concentration of dissolved oxygen that would eventually be demanded as wastewater degrades in the stream. Therefore, the DO level in the effluent as well as the BOD loading from the facility will have an impact on downstream DO levels.

Determining the facilities impact on DO levels downstream can be done by monitoring or through use of a DO water quality model. DO monitoring downstream of the Portneuf facility was performed by the city in 1988-1989 and reported in the assessment report cited in the previous section. With regards to downstream DO, the assessment report concluded: "There was no evidence of toxic oxygen conditions associated with Pocatello's effluent in the study reach; our research design was intended to include conditions that would be potentially most stressful (maximum summer temperatures with minimal dilution of treatment plant effluent)." Besides actual ambient monitoring, DO levels downstream could also be estimated by use of a DO water quality model. Such modeling requires a significant amount of data related to background and effluent DO, BOD, temperature, pH, and flow. Currently, there is insufficient data to conduct modeling of DO in-stream as a result of the effluent for other than screening purposes. Therefore, DO modeling will not be conducted as part of the permit reissuance.

Based on evaluation of the assessment study results and the lack of data to model in-stream DO, EPA has concluded that no DO limit or BOD limit based on DO water quality criteria are needed in the proposed permit. Instead, the permit will require DO monitoring of the effluent as well as measurement of DO in the Portneuf River (See ambient monitoring section of the fact sheet). Both the effluent and ambient data will be evaluated in the next permit reissuance in order to determine whether additional limitations are necessary to protect in-stream DO water quality criteria.

(f) Metals

The following metals are monitored twice a year as part of the pretreatment requirements of the existing NPDES permit and are considered the metals of concern for this facility: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, total cyanide, molybdenum and selenium. A reasonable potential calculation for each of these metals was completed as shown in Appendix B. The analysis found a reasonable potential that the discharge from the Pocatello facility causes or contributes to exceedances of the State's water quality standard for copper.

Analysis of the metals data submitted to EPA over the past five years found the effluent contained copper in concentrations above the method detection limit in all cases (30 sampling events). Copper concentration ranged from 11-92 micrograms per liter ($\mu$g/l). The water quality criteria for copper are 33 $\mu$g/l acute and 20 $\mu$g/l chronic. Since the discharge from the facility has a reasonable potential to cause or contribute to an exceedance of the water quality criteria, a water-quality based effluent limitation was calculated for copper. An average monthly limit of 42 $\mu$g/l (4.2 lbs/day) and a maximum daily limit of 103 $\mu$g/l (10.3 lbs/day) will be incorporated into the proposed permit (See Appendix C for derivation of limitations).

EPA was unable to conduct a reasonable potential calculation for cyanide. The State of Idaho cyanide criteria are for weak acid dissociable cyanide. The data collected under the existing permit is for total cyanide. The ratio of weak acid dissociable to total is unknown for this discharge. Monitoring for both total cyanide and weak acid dissociable cyanide is included in the proposed permit under the pretreatment monitoring requirements.

(g) Toxic Substances/Whole Effluent Toxicity

i). Bioassessment Report

The existing permit required the permittee to conduct a "Special Water Quality and Bioassessment of the Portneuf River" in order to determine whether the "discharge is creating a toxic condition in the stream." The permit specified the protocol and requirements for the assessment. The assessment was completed and the results were reported in the document entitled: Assessment of Possible Effects of Pocatello's Treated Wastewater on the Biology and Chemistry of the Portneuf River, Final Report dated November 1989. Some of the most significant conclusions are as follows:

"Throughout the effluent plume -- to the extent that it was sampled in this study -- dissolved oxygen, pH, and temperature were within acceptable ranges for maintenance of cold-water aquatic biota. Un-ionized ammonia, however, exceeded the USEPA's water quality standard of 0.016 mg/l for samples collected within the effluent plume during some days of August 1989. In fall 1988 the un-ionized ammonia concentrations were below the standard due to a greater dilution by river water and colder water temperatures, which influenced the ionization equilibrium for ammonia"

"Samples of the macroinvertibrate community within the effluent plume showed a clear indication of environmental impairment, with organisms belonging to the Ephemeroptera (mayflies) and Plecoptera (stoneflies) groups relatively less abundant, and oligochaetes, which are tolerant of environmental stress, relatively more abundant."

"There were fewer game fish above the WWTP than below both summer 1988 and fall 1989 while the opposite held true for non-game fish. The presence of springs in the reaches below the WWTP may have provided refuges for fish during periods of stressful water quality conditions, thus allowing fish normally intolerant to adverse environmental conditions to remain."

"During 1988-1989, effluent from the Pocatello WWTP had a detectable impact on water chemistry and macroinvertibrate assemblages in the lower Portneuf River. The impact of the effluent was lessened by the influx to the river channel of large volumes of groundwater, both above and below the point of discharge."

ii) Whole Effluent Toxicity

The state water quality standards require surface waters of the State to be free from toxic substances in concentrations that impair use classifications. Whole effluent toxicity (WET) limitations protect the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to the effluent. The existing permit does not contain WET limits or WET testing requirements.

WET testing was conducted on effluent samples in December 1997, January 1998, and February 1998 by Analytical Laboratories, Inc., for the City of Pocatello. The results were tabulated in three reports which were submitted to EPA as part of the NPDES permit reissuance application. The test found the following ranges for the no observed effect

concentration (NOEC) expressed as percent of effluent concentration: Ceriodaphnia test 12.5-25%, Fathead minnow test 12.5-50%, green algae 1-12.5%. This set of tests provides the only recent WET results available for the Pocatello discharge.

Due to the limited amount of available data, EPA is not establishing WET limitations at this time but instead proposes regular WET monitoring. The proposed permit will require two WET tests per year, one in winter and one in summer, for the five-year life of the permit. The additional test results will enable EPA to evaluate WET at the next permit reissuance and to also evaluate the impact of the new limitations (ammonia, chlorine, and copper limitations for example) on the toxicity of the discharge.

The permit will specify the dilution series to use during WET testing. Five dilutions are required, one at the instream waste concentration (IWC) and two above and two below the IWC. The IWC is the ratio of the effluent (18.56 cfs) over the effluent plus stream flow during critical conditions (175 cfs x 25% mixing zone). The resultant IWC is 30%.

The proposed permit also includes a "toxicity trigger". The trigger is set to identify when the target of 1 TUc (chronic toxic units) is exceeded at the edge of the mixing zone. With an IWC of 30%, the toxicity trigger is set at 1 TUc/0.30 = 3.3 TUc. When the trigger is exceeded, an accelerated test program is required. Should the toxicity trigger continue to be exceeded during the accelerated testing, a toxicity reduction evaluation (TRE) workplan shall be implemented. The proposed permit requires the facility to develop a TRE workplan within 180 days after the effective date of the permit.

(h) Temperature

The State water quality standards for cold water biota require water temperatures of 22 degrees C (72 °F) or less with a maximum daily average of no greater than 19 degrees C (66°F). The standards also require that the induced temperature variation not exceed plus one degree C. In addition to cold water biota, this segment of the Portneuf is protected for salmonid spawning. The State water quality standard for salmonid spawning requires water temperatures of 13 degrees C (55°F) or less with a maximum daily average no greater than 9 degrees C (48°F). The salmonid spawning criteria only apply during the time period for salmonid spawning and incubation as specified in the water quality standards. The time periods vary and are dependent on the species present in the water body. Idaho DEQ, with concurrence from the Idaho

Department of Fish and Game, recommends using the cutthroat trout as the species to identify the spawning and incubation time period for this stretch of the Portneuf River. Temperature requirements for this species, as outlined in Idaho's water quality standards, are from April 1 to August 1.

The existing permit requires daily monitoring of temperature of the effluent. Thirty-day average values are reported to EPA in the monthly discharge monitoring report. The existing permit does not require any instream temperature monitoring.

Temperature data from the outfall demonstrates that the effluent is in compliance with the cold water biota criteria, except for some values above 19.0 degrees C during the months of June-August. The highest monthly average value was 20.1 degrees C in August 1994. The Portneuf Bioassessment Report found that in-stream temperature was within acceptable ranges for maintenance of cold-water aquatic biota criteria during the time of the study suggesting the Portnuef has the assimilative capacity to bring effluent temperatures into acceptable range.

In-stream compliance with the salmonid spawning temperature criteria in the vicinity of the discharge is unknown. Effluent temperatures routinely exceed the monthly average criteria of 9 degrees centigrade during April-June. Monthly average temperatures are in the range of 11-17 degrees C. Little in-stream temperature data is available directly upstream of the facility or in the effluent plume. Due to the strong influence of springs in vicinity of the facility it is reasonable to assume that the Portneuf flows are much greater and cooler than the effluent during April-June and would assimilate any effluent temperature rise, although the data is insufficient to draw conclusions with regard to in-stream compliance with the salmonid spawning temperature criteria. Therefore, ambient and effluent monitoring for temperature will be required in the proposed permit. Daily effluent grab samples will continue to be monitored for temperature. Ambient monitoring for temperature, at Batiste Road and Siphon Road is being conducted by the City as part of an ongoing river quality assessment (see ambient monitoring section). Reporting of this ambient data will be required by the permit. Both the effluent and ambient data collected will be available to determine whether temperature water quality criteria are being met. This data will be used in the next permitting cycle to determine whether temperature limitations are necessary to meet state water quality criteria.

(i) Turbidity

The state water quality standards require that turbidity not exceed background turbidity by more than fifty (50) NTU instantaneously or more than twenty-five (25) NTU for more than ten (10) consecutive days. Data does not exist to support the development of a turbidity limit at this time. The proposed permit will require the permittee to monitor for turbidity, and this information will be used in the next permitting cycle to determine if a limit is required.

(j) Nutrients

The state water quality standards require surface waters of the State to be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated uses. The State of Idaho DEQ is developing a TMDL for this portion of the Portneuf River which will address nutrient loading by the City of Pocatello facility. Draft versions of the TMDL document indicate the facility may receive load allocations for two nutrient parameters: total inorganic nitrogen, and total phosphorus. When the TMDL is final, this permit may be reopened to incorporate applicable conditions. The proposed permit will require the permittee to monitor for nutrients both in the effluent and in-stream. The reopener provisions of the permit allow modification of the permit to address TMDL conditions.

(k) Floating, Suspended or Submerged Matter

The state water quality standards requires surface waters of the State to be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses. This requirement is a condition of the existing permit and will be retained in the proposed permit.

D. Pretreatment Program Requirements

The average daily industrial flow into the City of Pocatello Water Pollution Control Plant is about 1.6 mgd. The following is a list of significant industrial users provided by the City of Pocatello in the 1998 NPDES permit application:

Union Pacific Railroad
Weight Watchers Food Inc.
Gould AMI
Matlack Britesol
Great Western Malting
Gateway West Industrial Center

Meadow Gold Dairy.

The City of Pocatello operates a pretreatment program that meets the requirements of 40 CFR Part 403. The pretreatment program was approved by EPA and formally incorporated in the NPDES permit on April 18, 1985.

The city's pretreatment program has been evaluated on a periodic basis through on-site visits and review of the annual pretreatment reports. The city has submitted to EPA for review and approval program modifications including modification of the sewer use ordinance to incorporate changes required by federal regulations. The most recent modification was approved on October 28, 1996. Overall, the city is implementing an effective pretreatment program.

The proposed permit will require the permittee to conduct a local limits re-evaluation and report the results to EPA. Pretreatment conditions in the proposed permit are essentially the same as in the existing permit and include semi-annual sampling of the influent, effluent, and final sludge, submittal of a pretreatment annual report, and program management requirements. Changes in the proposed permit include deletion of the priority pollutant scan, dropping of the requirement to monitor primary clarifier effluent for metals, and deletion of the USGS survey requirement which has been completed. The priority pollutant scan and primary clarifier effluent monitoring requirements are no longer required since influent, effluent, and sludge sampling on a semiannual basis, along with annual reporting, is sufficient to evaluate performance of the program.

E. Sewage Sludge (Biosolids) Management Requirements

1. General. The sewage sludge (biosolids) management regulations of 40 CFR Part 503 were designed so that the standards are directly enforceable against most users or disposers of biosolids, whether or not they obtain a permit. Therefore, the publication of Part 503 in the *Federal Register* on February 19, 1993 served as notice to the regulated community of its duty to comply with the requirements of the rule, except those requirements that indicate that the permitting authority shall specify what has to be done. EPA Region 10 has chosen to implement the program through NPDES permits.

   Requirements are included in 40 CFR Part 503 for pollutants in biosolids, the reduction of pathogens in biosolids, the reduction of the characteristics in biosolids that attract vectors, the quality of biosolids that is placed in a MSWLF unit, and the sites where biosolids is either land applied or placed for final disposal. The sections of the federal standards at 40 CFR Part 503 applicable to this facility’s proposed practices are Section A (General

Provisions, 40 CFR §503.1-9), Section B (Land Application, 40 CFR §503.10-18), and Section D (Pathogen & Vector Control, 40 CFR §503.30-33).

2. Biosolids Management. The City of Pocatello Water Pollution Control Plant produces biosolids from the primary sedimentation process and from secondary activated sludge processes. The City currently treats and stabilizes biosolids in anaerobic digesters. After a residence time of about a month, digested biosolids are transferred to a lined storage lagoon. Biosolids are stored in the lagoon up to one year and are eventually applied as a fertilizer to agricultural land. The permittee has submitted to EPA, a biosolids management plan (City of Pocatello, Idaho, Biosolids Management Plan, February 1998), which describes the procedures used by the City for the recycling/reuse of biosolids through land application on agricultural fields. The biosoids plan also describes the city-owned sites where biosolids will be applied (see 3.f. below ).

   For land application sites being used for the distribution of biosolids, the proposed permit defines the area where biosolids may be distributed, establishes limitations for ten metals, establishes pathogen reduction requirements, establishes vector control requirements, and requires the permittee to notify interested parties prior to application at new sites within established boundaries.

3. Permit Requirements. To ensure compliance with the CWA and the federal standards for the use or disposal of biosolids (40 CFR Part 503), the proposed permit contains the following requirements:

   a. State Laws and Future Federal Standards

   Pursuant to 40 CFR §122.41(a), a condition has been incorporated into the proposed permit requiring the Permittee to comply with all existing federal and state laws, and all regulations applying to biosolids use and disposal. These standards shall be interpreted using the proposed permit and the specific EPA guidance documents listed in paragraph b, below. These documents are used by EPA Region 10 as the primary technical references for both permitting and enforcement activities.

   b. Health and Environmental General Requirement

   The CWA requires that the environment and public health be protected from toxic effects of any pollutants in biosolids. Therefore, the Permittee must handle and use/dispose of biosolids in such a way as to protect

human health and the environment. Under this requirement the permittee is responsible for being aware of all pollutants allowed to accumulate in the biosolids, and for preventing harm to the public from those pollutants.

The U.S. Department of Agriculture can assist the facility in evaluating potential nutrient or micronutrient problems. Additionally, EPA has published the following guidance to assist facilities in evaluating their biosolids for pollutants other than those listed in 40 CFR Part 503: *Part 503 Implementation Guidance*, EPA 833-R-95-001, and *Environmental Regulations and Technology: Control of Pathogens and Vector Attraction in Sewage Sludge*, EPA/625/R-92/013.

c. Protection of Surface Waters from Biosolids Pollutants

Section 405(a) of the CWA prohibits any practice where biosolids pollutants removed in a treatment works at one location would ultimately enter surface waters at another location. Under this requirement the Permittee must protect surface waters from metals, nutrients, and pathogens contained in the biosolids.

d. Responsibility for Land Application

40 CFR §503.7 of the biosolids regulations specify that generators are responsible for correct use or disposal of their biosolids. For purposes of this permit and for purposes of compliance with the 40 CFR Part 503 regulations, the permittee is considered the "person who applies biosolids to the land" under the land application regulations. All haulers, contractors, farmers, or others who might be involved in the land application process or in post-application control of the land and the crops are considered agents for the permittee, for determination of compliance with the permit and for determination of compliance with the 40 CFR Part 503 regulations (which are self-implementing).

e. Control of Pathogens, Vectors, and Metals

The regulations allow alternative methods and measurements for preparing Class B biosolids. The proposed permit, developed based on the permittee's application, establishes basic standards that the biosolids must meet for metals, pathogens, and vector control. Additionally, the proposed permit allows the Permittee to use alternative standards which are available under the regulations. The permittee must submit written notice to EPA 30 days in advance of using an alternative standard.

f. Distribution Areas, Products, and Use/Disposal Practices

The proposed permit identifies the geographical area within which the permittee may distribute sludge or biosolids products. The Biosolids Management Plan (February 1998) describes the City-owned land where biosolids are applied. The city presently applies biosolids to about 800 acres of farm land (see Appendix D for map). All of the current areas are within the "Pocatello Biosolids Recycling/Reuse Site." Also within this site boundary is additional acreage available to the city for development. The city is pursuing development of a portion of these additional acres within the current five-year planning period. The current and proposed sites are listed in the following table.

**Table 2. Application Sites Used for Land Application -- "Pocatello Biosolids Beneficial Reuse Site"**

| Site Name | Acre-age | Location | | Site Type | Crop |
|---|---|---|---|---|---|
| | | Latitude | Longitude | | |
| Old Airport | 300 | 112°32'30" | 42°55' | Agricultural Land | Wheat, Canola |
| Airport120 | 120 | 112°34' | 42°54' | Agricultural Land | Wheat |
| Airport 20 | 20 | 112°34' | 42°54' | Agricultural Land | Wheat |
| Airport 11 | 11 | 112°34' | 42°54' | Agricultural Land | Alfalfa, Wheat Rotation |
| Freeway 30 | 30 | 112°34' | 42°54' | Agricultural Land | Alfalfa, Wheat Rotation |
| Runway 30 | 30 | 112°34' | 42°55' | Agricultural Land | Alfalfa, Wheat Rotation |
| West Airport 800 | 800 | 112°34' | 42°55' | Agricultural Land | Alfalfa, Wheat Rotation |
| Future Acquired Land | 500 | | | Agricultural Land | Alfalfa, Wheat Rotation |

The City's Biosolids Management Plan states that operating criteria for biosolids reuse on the future acquired land will be identical to the criteria used on existing sites and as detailed in the management plan. The proposed permit authorizes land application to the sites listed in the table

but will require the city to provide notice to interested parties prior to applying biosolids to areas listed under "future acquired sites". Part of the notification process will include distribution of the most recent Biosolids Management Plan for the new site. The general methods and options for biosolids treatment, use, or disposal are described in the proposed permit.

g. Crop Trials

Optimum loading rates, application methods, crop responses, environmental impacts, cost-effectiveness, and other agricultural practices may vary with different crops and from site to site when using biosolids as a soil amendment. Applying biosolids to areas of land two acres or less facilitates the development of appropriate agricultural practices when using biosolids as a soil amendment.

The permit authorizes the distribution of biosolids on areas of land two acres or less for the purpose of optimizing agricultural practices. The land used for crop trials does not need to be within the authorized land application sites.

The permittee must notify the Environmental Protection Agency, Idaho Operations Office, the Idaho Division of Environmental Quality, Southwest Idaho Regional Office, and the Natural Resources Conservation Service of the U.S. Department of Agriculture nearest the area of the site when distributing biosolids for crop trials outside the authorized land application sites.

h. Reporting

At a minimum, 40 CFR §503.18 specifies that certain facilities report annually the information that they are required to develop and retain under the record keeping requirements (40 CFR §503.17). This requirement applies to permittees defined as Class I management facilities, POTWs with a flow rate equal to or greater than one mgd, and POTWs serving a population of 10,000 or greater. The following information should be included to improve the reliability of the report: units for reported concentrations, dry weight concentrations, number of samples collected during the monitoring period, number of excursions during the monitoring period, sample collection techniques, and analytical methods.

F. Monitoring Requirements

The following monitoring requirements have been included in the permit pursuant to section 308 of the CWA and 40 CFR §122.44(I). Monitoring frequencies are based on the nature and effect of the pollutants, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance.

1. Influent and Effluent Monitoring. The proposed permit requires monitoring for the following parameters.

**Table 3. Influent and Effluent Monitoring**

| Parameter | Sample Location | Sample Frequency | Sample Type |
|---|---|---|---|
| Flow, mgd | Effluent | Continuous | Recording |
| Temperature, °C | Effluent | daily | grab |
| pH, standard units | Effluent | daily | grab |
| $BOD_5$, mg/L | Influent and Effluent | 5 days /week | 24 hour composite |
| TSS, mg/L | Influent and Effluent | 5 days/week | 24 hour composite |
| Fecal Coliform Bacteria, colonies/100 ml | Effluent | 5 days/week | grab |
| Total Residual Chlorine, mg/L | Effluent | 5 days/week | grab |
| Ammonia as N, mg/L | Effluent | 5 days/week | 24 hour composite |
| Dissolved Oxygen, mg/L | Effluent | 5 days/week | grab |
| E. Coli Bacteria | Effluent | 1/week | grab |
| Copper, µg/L | Effluent | 1/week | 24 hour composite |
| WET, $TU_c$ [1] | Effluent | quarterly | 24 hour composite |
| Total Kjeldahl Nitrogen[2], mg/L | Effluent | 1/week | 24 hour composite |
| Nitrate-Nitrite as N[2], mg/L | Effluent | 1/week | 24 hour composite |
| Total Phosphorus[2], mg/L | Effluent | 1/week | 24 hour composite |
| Ortho-phosphate[2], mg/L | Effluent | 1/week | 24 hour composite |
| Turbidity[2], NTU | Effluent | 1/week | 24 hour composite |

1. For first five years following issuance of the permit for a total of ten sampling events.
2. These parameters shall be analyzed for a period of one year.

2. Ambient Monitoring. At the time of the drafting of this fact sheet the City of Pocatello is conducting a two-year monitoring study of the Portneuf River near the waste-water treatment plant facility. The program is designed to address questions regarding groundwater spring influences near the outfall, determination of the spatial distribution of the mixing zone, and monitoring of water quality characteristics in the Portneuf River near the facility. The monitoring program started in January 1998, and is scheduled to be completed in December 1999. Study results are scheduled to be available in April 2000. A description of the monitoring program was provided to EPA by the city in a memorandum dated February 25, 1998, and is included as Appendix E to this fact sheet.

   Due to the monitoring program currently being conducted by the City of Pocatello, no further ambient monitoring is required by the NPDES permit. Due to the importance of the study results, particularly with regards to nutrients, temperature and DO compliance with water quality standards, the permit will require the City to complete the monitoring through December of 1999, as outlined in the memorandum, and to submit the final report and data to EPA by May 1, 2000. EPA will review the results, along with the effluent monitoring required in the permit, and determine whether the data indicates additional NPDES requirements are necessary in order to protect water quality of the Portneuf River. If additional requirements are necessary, EPA has the ability to exercise the reopener clause of the permit and propose modification of the requirements.

3. Pretreatment Certified Data Method Detection Limits. During the next permitting cycle the need for incorporating water quality based effluent limits into the permit will be re-evaluated. In order to assess if the water quality of the Portneuf River is being impacted by the effluent from Pocatello's facility, it is necessary to use analytical methods that have method detection limits below the water quality criteria. Therefore, the permittee will be required to achieve the following:

Table 4. Method Detection Limits

| Parameter | Method Detection Limit |
|---|---|
| Arsenic | 0.5 µg/L |
| Cadmium | 0.05 µg/L |
| Chromium | 0.1 µg/L |
| Copper | 5 µg/L |
| Cyanide | 20 µg/L |

| Table 4. Method Detection Limits | |
|---|---|
| Parameter | Method Detection Limit |
| Lead | 0.7 µg/L |
| Mercury | 0.2 µg/L |
| Nickel | 0.6 µg/L |
| Silver | 0.5 µg/L |
| Total Residual Chlorine | 10 µg/L |
| Zinc | 0.05 µg/l |

G. Quality Assurance Plan

Under 40 CFR §122.41(e), the permittee must properly operate and maintain all facilities which it uses to achieve compliance with the conditions of the permit. This regulation also requires the permittee to ensure adequate laboratory controls and appropriate quality assurance procedures. Quality assurance requirements apply to all monitoring requirements in the proposed permit including sample collection, handling, and shipment, on-site continuous and daily measurements, laboratory analysis, and data reporting and storage.

The draft permit requires the permittee to develop a quality assurance project plan within 90 days of the effective date of the permit. The plan is intended to address sampling techniques, sample preservation and shipment procedures, instrument calibration and preventive maintenance procedures, personnel qualifications and training, and analytical methods.

## VI. Antidegradation

The Portneuf River is a Tier I waterbody. In proposing to reissue this permit, EPA has considered Idaho's antidegradation policy (IDAPA 16.01.02.051.01). This provision states that "the existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." The issuance of this permit will not result in the increase loading of pollutants. Therefore, the limits in the permit are consistent with Idaho's antidegradation policy.

## VII. Other Legal Requirements

A. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USF&WS) regarding potential effects an action may have on listed endangered species. In a letter dated September 18, 1998, the U.S. Department of the Interior, Fish and Wildlife Service provided a preliminary determination that the project (reissuance of the permit) is unlikely to adversely impact any species listed under the Endangered Species Act of 1973, as amended.

In a letter dated October 2, 1998, the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service stated that there are no threatened or endangered anadromous fish species known to be present in the proposed action area. The Service does, however, note that Snake River spring/summer and fall chinook salmon, Snake River Sockeye salmon, and West Coast steelhead are anadromous fish species listed under the ESA that are known to occur in the Snake River basin, downstream from the Hells Canyon Dam. Critical habitat has been designated for chinook and sockeye salmon, more than 200 miles downstream from the mouth of the Portneuf River. There are no proposed or candidate anadromous fish species known to be present in the proposed action area.

The proposed permit includes secondary treatment limitations as well as limits on ammonia, chlorine, and copper. The proposed permit also includes WET monitoring and additional effluent and ambient river monitoring. Due to the nature of the discharge, it is not likely that the proposed permit will affect the Snake River salmon or West Coast steelhead. EPA will provide NMFS and USF&WS with copies of the proposed permit and fact sheet during the public notice period. Any comments received from these agencies regarding this determination will be considered prior to reissuance of this permit.

B. State Certification

Because state waters are involved in this permitting action, the provisions of Section 401 of the CWA apply. In accordance with 40 CFR §124.10(c)(1), public notice of the draft permit has been provided to the State of Idaho agencies having jurisdiction over fish, shellfish, and wildlife resources.

As part of the certification, the State will be asked to certify the mixing zone used in calculating the effluent limitations in the proposed permit. If certification of the mixing zone is not provided, the limitations in the permit will be recalculated based on meeting water quality standards at the point of discharge.

C. Length of Permit

This permit shall expire five years from the effective date of the permit.

APPENDIX A

Criteria Applicable To the Portneuf River

**Criteria for the protection of cold water biota:**

1.

| Parameter | Aquatic Life Criteria[1] | | Human Health Criteria[2] |
|---|---|---|---|
| | Acute criteria | Chronic criteria | |
| Arsenic ($\mu$g/L) | 360 | 190 | 50 |
| Cadmium[3] ($\mu$g/L) | 7.8 | 1.7 | NA |
| Chromium[3] ($\mu$g/L) | 980 | 320 | NA |
| Copper[3] ($\mu$g/L) | 33 | 21 | NA |
| Lead[3] ($\mu$g/L) | 140 | 5.4 | NA |
| Mercury ($\mu$g/L) | 2.0 | 0.012 | 0.15 |
| Nickel[3] ($\mu$g/L) | 2577 | 286 | 4600 |
| Silver[3] ($\mu$g/L) | 12 | NA | NA |
| Zinc[3] ($\mu$g/L) | 208 | 190 | NA |
| Cyanide[4]($\mu$g/L) | 22 | 5.2 | NA |
| Selenium ($\mu$g/L) | 20 | 5 | NA |
| Chlorine (µg/L) | 19 | 11 | NA |
| Ammonia[5] (mg/L) | 13.8 | 1.9 | NA |

1. The acute and chronic aquatic life criteria for metals are expressed as the dissolved fraction of the metal.
2. The human health criteria are expressed as the total recoverable fraction of the metal.
3. The aquatic life criteria for cadmium, chromium, copper, lead, nickel, silver, and zinc are hardness dependent. The hardness value used was 203 mg/l as $CaCO_3$ and represents hardness at the edge of the mixing zone. This value is a weighting of 190 mg/L assumed in the stream (minimum value in STORET data base at Tyhee site) and 326 mg/l in effluent (minimum value in 1998 WET test sample data base).
4. Cyanide is expressed as "weak acid dissociable".
5. The ammonia criteria are dependent on ambient pH and temperature. The temperature and pH assumed for instream is 17° C and 7.4 standard units respectively. With pH and temperature the ammonia criteria were determined from the Idaho Water Quality Standards, cold water biota criteria, Tables 3 and 4. The temperature and pH values were taken from the City of Pocatello 1989 Portneuf River assessment report from the Rowlands site immediately upstream of the facility during conservative conditions (i.e. late-summer, high and ambient and water temperatures and low river flow).

2. pH values must be within the range of 6.5 - 9.5.

3. The total concentration of dissolved gas not exceeding 110% of saturation at atmospheric pressure at the point of sample collection.

4. Dissolved Oxygen Concentrations must exceed 6 mg/L at all times.

5. Water temperature must be 22°C or less with a maximum daily average of no greater than 19 °C .

6. Turbidity, below any applicable mixing zone set by the Department, shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.

7. Surface waters shall be free from floating, suspended or submerged materials.

8. Surface waters shall be free from toxic substances in concentration that impair designated beneficial uses.

**Criteria for the protection of secondary contact recreation:**

1.

| Parameter | Human Health Criteria |
|---|---|
| Arsenic ($\mu$g/L) | 50 |
| Nickel ($\mu$g/L) | 4600 |

2. Fecal coliform bacteria are not to exceed:

   i. 800 colonies/100ml at any time; and
   ii. 400 colonies/100 ml in more than 10% of the samples taken over 30 days; and
   iii. a geometric mean of 200 colonies/100 ml based on a minimum of 5 samples taken over a thirty day period.

3. Surface waters shall be free from floating, suspended or submerged materials.

4. Surface waters shall be free from toxic substances in concentration that impair designated beneficial uses.

**Criteria for the protection of agricultural use:**

1.

| Parameter | Livestock Criteria | Irrigation Criteria |
|---|---|---|
| Arsenic ($\mu$g/L) | 200 | 100 |
| Cadmium ($\mu$g/L) | 50 | 10 |

| Parameter | Livestock Criteria | Irrigation Criteria |
|---|---|---|
| Chromium ($\mu$g/L) | 1000 | 100 |
| Copper ($\mu$g/L) | 500 | 200 |
| Lead ($\mu$g/L) | 50 | 5000 |
| Nickel ($\mu$g/L) | NA | 200 |
| Zinc ($\mu$g/L) | 25000 | 2000 |
| Nitrates & Nitrites (mg/L) | 100 | NA |
| Nitrites (mg/L) | 10 | NA |
| NOTE: NA = not applicable | | |

2. Surface waters shall be free from floating, suspended or submerged materials.

3. Surface waters shall be free from toxic substances in concentration that impair designated beneficial uses.

**Criteria for the protection of salmonid spawning:**

1. Waters designated for salmonid spawning are to exhibit the characteristics listed in paragraph 2, 3, and 4 below during the spawning period and incubation for the particular species inhabiting those waters. Time periods for each species are found in the Idaho Water Quality Standards. Idaho DEQ recommends using cutthroat trout as the species inhabiting the Portneuf River. The time period for salmonid spawning and incubation for cutthroat trout is April 1 through August 1.

2. Dissolved Oxygen. Intergravel dissolved oxygen shall have a one day minimum of not less than 5.0 mg/l; seven day average mean of not less than 6.0 mg/l. Water-column dissolved oxygen shall have a one day minimum of not less than 6.0 mg/l or 90% of saturation, whichever is greater.

3. Water temperatures of 13 degrees C or less with a maximum daily average no greater than 9 degrees C.

4. The ammonia criteria established for cold-water biota apply for protection of salmonid spawning.

APPENDIX B
Reasonable Potential Determination

To determine if a water quality based effluent limitation is required, the receiving water concentration of pollutants is determined downstream of where the effluent enters the receiving water with an allowance made for a mixing zone. If the projected receiving water concentration is greater than the applicable numeric criterion for a specific pollutant, there is reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard and an effluent limit must be incorporated into the NPDES permit.

The receiving water concentration is determined using the following mass balance equation.

$C_d \text{ X } Q_d = (C_e \text{ X } Q_e) + (C_u \text{ X } Q_u)$

$$C_d = \frac{(C_e \text{ X } Q_e) + (C_u \text{ X } Q_u)}{Q_d}$$

where,
$C_d$ = receiving water concentration downstream of the effluent discharge
$Q_d$ = receiving water flow downstream of the effluent discharge
$C_e$ = maximum projected effluent concentration
$Q_e$ = maximum effluent flow
$C_u$ = upstream concentration of pollutant
$Q_u$ = upstream flow

**Mixing Zone/Flow Conditions**

The Idaho water quality standards at IDAPA 16.01.02060 allow twenty-five percent (25%) of the receiving water to be used for dilution for aquatic life criteria. One hundred percent (100%) of the receiving water can be used for dilution for human health criteria. Typically, the flow used by EPA to evaluate compliance with the criteria include:

- The 1 day, 10 year low flow (1Q10) is used for the protection of aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years.
- The 7 day, 10 year low flow (7Q10) is used for the protection of aquatic life from chronic effects. It the lowest 7 day average flow expected to occur once in 10 years.
- The harmonic mean flow is used for the protection of human health from carcinogens. It is the number of daily flow measurements divided by the sum of the reciprocals of the flows.
- The 30 day, 5 year low flow (30Q5) is used for the protection of human health

from non carcinogens. It represents the 30 day average flow expected to occur once in 5 years.

The statistical flows are typically calculated from USGS sites or other data bases, nearest to the outfall. No USGS sites are in the immediate vicinity of the City of Pocatello facility. The nearest upstream site is roughly four miles above the facility in the City of Pocatello at Carson Street. The statistical flows calculated from the Carson Street USGS data base:

| Table B-1.<br>Statistical River Flows - Carson Street | |
|---|---|
| 1Q10 | 6.92 cfs |
| 7Q10 | 13.19 cfs |
| 30Q5 | 34.88 cfs |

The nearest downstream USGS site is the Tyhee site which is roughly 3 miles from the facility.

The 1989 assessment of the Portneuf River by the City of Pocatello (Assessment of Possible Effects of Pocatello's Treated Wastewater on the Biology and Chemistry of the Portneuf River, 11/89) contains a summary of the hydrology in the vicinity of the outfall. A dominant feature of the Portneuf River near the facility is the presence of numerous springs. Batiste Spring and Papoose Springs are two major springs that discharge into the river in the vicinity of the facility. Portions of both of these springs are used as water source for trout/salmon farming operations. The 1989 assessment report notes that "In addition to spring tributaries which have identifiable confluences with the Portneuf River, other areas of groundwater discharge within the river channel are visibly apparent as indicated by patterns of water clarity, temperature, and the distribution of aquatic macrophytes. The surface and groundwater hydrology of this reach of the Portneuf River is extremely complex".

The 1989 assessment of the Portneuf City reported the following flows:

| Table B-2, Estimated Flow for the Portneuf River (11/89 Report) | | | | |
|---|---|---|---|---|
| Location | Date | | | |
| | 9/1/88 | 6/12/89 | 7/3/89 | 8/4/89 |
| Portneuf at Carson St. Gauge | 26 | 201 | 58 | 24 |
| Portneuf above WWTP Effluent | 186 | 323 | 199 | 175 |
| WWTP Effluent to River | 11 | 9 | 2 | 10 |
| Portneuf at Siphon Road | 316 | 455 | 330 | 328 |
| Portneuf at Tyhee Gauge | 193 | 245 | 126 | 195 |

The table shows flow estimates at the Carson Street gauge, a site immediately above the plant, the effluent discharge to the river, a site below the plant, and the site at the Tyhee gauge. The data demonstrates the large increases between the Carson Street site and the site immediately above the plant. The river flow continues to increase below the facility as measured at the Siphon Road site, due to spring and groundwater discharge to the river. There is a canal diversion below Siphon Road which accounts for the decrease between Siphon Road and Tyhee Gauge.

Due to the complex hydrology in the vicinity of the plant, EPA will use flow measured immediately upstream in the water quality evaluations as an alternative to using the USGS data. The 1988-1989 assessment report is the only known source of river flow data adjacent to the plant. The size of the data base does not allow for statistical determination of low flow, therefore, the lowest actual measured value will be used to evaluate the reasonable potential of the facility to contribute to water quality standard exceedances and to determine effluent limitations if needed. The lowest flows above the facility occurred on August 4, as shown in Table B-2. The flow of 175 cfs will be used as the Portneuf River flow immediately upstream of the facility for the subsequent calculations shown in this appendix and in appendix C.

In accordance with state water quality standards, only the Idaho Department of Health and Welfare, Division of Environmental Quality (IDHW-DEQ) may authorize mixing zones. The reasonable potential calculations are based on a mixing zone of 25% for aquatic life. If the State does not authorize a mixing zone in its 401 certification, the permit limits will be re-calculated to ensure compliance with the standards at the point of discharge.

If a mixing zone (%MZ) is allowed, the mass balance equation becomes

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

**Maximum Projected Effluent Concentration**

When determining the projected receiving water concentration, EPA's *Technical Support Document for Water Quality-based Toxics Controls (1991)* recommends using the maximum projected effluent concentration. To determine the maximum projected effluent concentration ($C_e$) EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) (standard deviation/mean) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV's for each parameter have been calculated, the reasonable potential multiplier used to derive the maximum projected effluent concentration ($C_e$) can be found in Table 3-1 of EPA's *Technical Support Document for Water Quality-based Toxic Control* (TSD).

The maximum projected concentration ($C_e$) for the effluent is equal to the highest observed value of the data set multiplied by the reasonable potential multiplier.

The following table summarizes the CV's, reasonable potential multipliers from the TSD, the highest observed effluent concentration and maximum projected concentration ($C_e$) for twelve metals, ammonia, and chlorine. The CV and maximum effluent concentration for the metals were determined from data submitted in the pretreatment reports over the past 5 years (30 sampling events). Ammonia and chlorine CV's and maximum effluent concentrations were determined from monthly data reports submitted over the last 2 years.

Table B-3. Effluent Data Summary for Reasonable Potential Determinations

| Parameter | Coefficient of Variation (CV) | Reasonable Potential Multiplier | Maximum Effluent Concentration [1], $\mu$g/L | Maximum Projected Effluent Concentration ($C_e$), $\mu$g/L |
|---|---|---|---|---|
| Arsenic | --- [2] | --- | Non-detect (ND) | ND |
| Cadmium | --- | --- | ND | ND |
| Chromium | 0.27 | 1.6 | 12 | 19.2 |
| Copper | 0.97 | 3.5 | 92 | 322 |
| Lead | --- | --- | ND | ND |
| Mercury | 0.6 | 2.3 | 0.6 | 1.38 |
| Nickel | 0.6 | 2.3 | 6 | 13.8 |
| Silver | 0.6 | 2.3 | 4 | 9.2 |
| Zinc | 0.43 | 1.8 | 98 | 176.4 |
| Total Cyanide | 0.52 | 2.0 | 17 | 34 |

| Table B-3. Effluent Data Summary for Reasonable Potential Determinations | | | | |
|---|---|---|---|---|
| Molybdenum | 0.6 | 2.3 | 2 | 4.6 |
| Selenium | --- | --- | ND | ND |
| Ammonia | 0.50 | 1.0 | 29,400 | 29,400 |
| Chlorine | 0.50 | 1.0 | 1,250 | 1,250 |

1. The maximum projected effluent concentration for the metals is expressed as total metal.
2. Where all data was below the method detection limit there is no reasonable potential of the effluent to cause an exceedance of this parameter. If the number of samples above detection is greater than 0 but less than 10, the CV was assumed to equal the default of 0.6.

**Dissolved vs Total Metals**

When determining the reasonable potential of these parameters to violate water quality standards, the projected receiving water concentration is compared to the criteria. The aquatic life criteria for the metals are expressed as dissolved. The maximum projected receiving water concentrations in the table above are expressed as total.

The dissolved metal is the concentration of an analyte that will pass through a 0.45 micron membrane filter assembly. Total metal is the concentration of analyte in an unfiltered sample. In order to compare the projected receiving water concentration to the criteria, the projected receiving water concentration was multiplied by a translator to convert the value to dissolved. These are default translators (See "The Metals Translator: Guidance for Calculation a Total Recoverable Permit Limit from a Dissolved Criterion," EPA 823-B-96-007, June 1996).

**Reasonable Potential Calculations for Chlorine and Ammonia**

1. Ammonia

(a) Determine if there is reasonable potential for the acute aquatic life criterion to be violated. The upstream flow used to make the determination is 175 cfs (see discussion above). Assume the State will allow a 25% mixing zone. The $Q_e$ is 18.56 cfs which is the facility design flow. The effluent concentration ($C_e$) is 29.4 mg/L (see table B-2). $Q_u$ is the maximum upstream ammonia concentration from the 1989 City of Pocatello assessment report; 0.5 mg/L.

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

$$C_d = \frac{(29.4 \times 18.56) + (0.5 \times (175 \times .25)}{18.56 + (175 \times .25)} = 9.11 \text{ mg/L}$$

Since 9.11 mg/L is less that the acute aquatic life criterion 14 mg/L there is no reasonable potential for the effluent to cause an exceedance to the acute water quality standard.

(b) Determine if there is reasonable potential for the chronic aquatic life criterion to be violated. For this permit, the river flow assumption is the same for both acute and chronic calculations so the $C_d$ will also be the same for both determinations. Since 9.11 mg/L is greater than the chronic aquatic life criterion (1.9 mg/L), there is a reasonable potential for the effluent to cause an exceedance to the chronic water quality standard and a water quality based effluent limit is needed for ammonia.

2. Chlorine

(a) Determine if there is reasonable potential for the acute aquatic life criterion to be violated. The upstream flow used to make the determination is 175 cfs (see discussion above). Assume the State will allow a 25% mixing zone. The $Q_e$ is 18.56 cfs which is the facility design flow. The effluent concentration ($C_e$) is 1250 $\mu$g/L (see table B-2). The upstream concentration of chlorine is assumed to be zero.

$$C_d = \frac{(C_e \text{ X } Q_e) + (C_u \text{ X } (Q_u \text{ X } \%MZ))}{Q_e + (Q_u \text{ X } \%MZ)}$$

$$C_d = \frac{(1250 \text{ X } 18.56) + (0 \text{ X } (175 \text{ X } .25)}{18.56 + (175 \text{ X } .25)} = 372 \text{ µg/L}$$

Since 372 µg/L is greater than the acute aquatic life criterion (19 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard. Therefore, a water quality based effluent limit is required.

(b) Determine if there is reasonable potential for the chronic aquatic life criterion to be violated. For this permit, the river flow assumption is the same for both acute and chronic calculations so the $C_d$ will also be the same for both determinations. Since 372 $\mu$g/L is greater than the chronic aquatic life criterion (11 $\mu$g/L), there is a reasonable potential for the effluent to cause an exceedance to the chronic water quality standard and a water quality based effluent limit is needed for chlorine.

**Reasonable Potential Calculations for Metals**

Similar reasonable potential calculations were carried out for the metals using the data in Table B-2 above. For all the metals analyzed, only copper showed a reasonable potential to contribute to an exceedance of a water quality criteria:

1. Copper

(a) Determine if there is reasonable potential for the acute aquatic life criterion to be violated. The upstream flow used to make the determination is 175 cfs (see discussion above). Assume the State will allow a 25% mixing zone. The $Q_e$ is 18.56 cfs which is the facility design flow. The effluent concentration ($C_e$) is 322$\mu$g/L as total metal (see Table B-2 above). The translator for converting copper in total form to copper dissolved is 1.04 (Ce = 322$\mu$g/L/1.04 = 309.6$\mu$g/L). The upstream concentration of copper used in the calculation is 5$\mu$g/L dissolved. This value was from a 1995 EPA report that monitored metal concentration in the Portneuf river downstream of the FMC facility. The copper concentration was immediately upstream of the City of Pocatello facility.

$$C_d = \frac{(C_e \text{ X } Q_e) + (C_u \text{ X } (Q_u \text{ X } \%MZ))}{Q_e + (Q_u \text{ X } \%MZ)}$$

$$C_d = \frac{(309.6 \text{ X } 18.56) + (5 \text{ X } (175 \text{ X } .25)}{18.56 + (175 \text{ X } .25)} = 95.7 \text{ µg/L}$$

Since 95.7 µg/L is greater than the acute aquatic life criterion (33 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard. Therefore, a water quality based effluent limit is required.

(b) Determine if there is reasonable potential for the chronic aquatic life criterion to be violated. For this permit, the river flow assumption is the same for both acute and chronic calculations so the $C_d$ will also be the same for both determinations. Since 95.7 $\mu$g/L is greater than the chronic aquatic life criterion (20 $\mu$g/L), there is a reasonable potential for the effluent to cause an exceedance to the chronic water quality standard and a water quality based effluent limit is needed for copper.

2. Other Metals

A reasonable potential calcuation was not completed for mercury. Of the 30 samples taken for mercury over the last 5 years, 29 samples were found to be below the method detection limit. EPA will not conduct a reasonable potential calculation for mercury for this permit based on one data sample above detection. Additional monitoring is required in the permit.

A reasonable potential calculation was also not conducted for cyanide since the water quality standard is for weak acid dissociable cyanide and the data available is for total cyanide. As discussed in this fact sheet, the proposed permit contains additional monitoring requirements for weak acid dissociable cyanide.

# APPENDIX C
## Derivation of Water Quality Based Effluent Limitations

The purpose of a permit limit is to specify an upper bound of acceptable effliuent quality. For water quality based requirements, the permit limits are based on maintaining the effluent quality at a level that will comply with the water quality standards, even during critical conditions in the receiving water (i.e., low flows). These requirements are determined by the wasteload allocation (WLA). The WLA dictates the required effluent quality which, in turn, defines the desired level of treatment plant performance or target long-term average (LTA).

To support the implementation of EPA's national policy for controlling the discharge of toxicants, EPA developed the "Technical Support Document for Water Quality-Based Toxics Control" (EPA/505/2-90-001, March 1991). The following is a summary of the procedures recommended in the TSD in deriving water quality-based effluent limitations for toxicants. This procedure translates water quality criteria for chlorine, ammonia, and copper to "end of the pipe" effluent limits.

Step 1: Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations ($WLA_{acute}$ or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$Q_dC_d = Q_eC_e + Q_uC_u$$

where,
- $Q_d$ = downstream flow = $Q_u + Q_e$
- $C_d$ = aquatic life criteria that cannot be exceeded downstream (see Appendix A)
- $Q_e$ = effluent flow = 12 mgd = 18.564 cfs (design flow from permit application)
- $C_e$ = concentration of pollutant in effluent = $WLA_{acute}$ or $WLA_{chronic}$
- $Q_u$ = upstream flow = 175 cfs (see Appendix B)
- $C_u$ = upstream background concentration of pollutant
  - = 0.0 for chlorine (assumption)
  - = 0.5 mg/L, ammonia, from the 1989 Portneuf River assessment report by City of Pocatello
  - = 0.5 $\mu$g/L, copper, from EPA study -----

Rearranging the above equation to determine the effluent concentration ($C_e$) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{Q_dC_d - Q_uC_u}{Q_e} .$$

When a mixing zone is allowed, this equation becomes:

$$C_e = WLA = \frac{C_d(Q_u \text{ X } \%MZ) + C_d Q_e}{Q_e} - \frac{Q_u C_u (\%MZ)}{Q_e}.$$

The term, %MZ is the mixing zone[1] allowable by the state standards. The Idaho water quality standards at IDAPA 16.01.02060 allow twenty-five percent (25%) of the receiving water to be used for dilution for aquatic life criteria. The effluent limits have been derived using Idaho's guidelines for mixing zones. However, establishing a mixing zone is a State discretionary function, if the State does not certify a mixing zone in the 401 certification process the effluent limits will be recalculated without a mixing zone.

Chlorine $WLA_{acute}$ $= \frac{C_d(Q_u \text{ X } \%MZ) + C_d Q_e}{Q_e} - \frac{Q_u C_u (\%MZ)}{Q_e}$

$= \frac{19(175 \text{ X } .25) + (19 \text{ X } 18.56)}{18.56} - \frac{175 \text{ X } 0 \text{ } (.25)}{18.56} = 63.79$ µg/L

Chlorine $WLA_{chronic}$ $= \frac{11(175 \text{ X } .25) + (11 \text{ X } 18.56)}{18.56} - \frac{175 \text{ X } 0 \text{ } (.25)}{18.56} = 36.93$ µg/L

Ammonia $WLA_{acute}$ $= \frac{13.78(175 \text{ X } .25) + (13.78 \text{ X} 18.56)}{18.56} - \frac{175 \text{ X} 0.5 \text{ } (.25)}{18.56} = 45.084$mg/L

Ammonia $WLA_{chronic}$ $= \frac{1.9(175 \text{ X } .25) + (1.9 \text{ X } 18.56)}{18.65} - \frac{175 \text{ X } .5 \text{ } (.25)}{18.56} = 5.2$ mg/L

Copper $WLA_{acute}$ $= \frac{33(175 \text{ X } .25) + (33 \text{ X} 18.56)}{18.56} - \frac{175 \text{ X} 5(.25)}{18.56} = 99.00$µg/L dissolved

=99.00 $\mu$g/L dissolved x 1.04 (translator) = 102.96 $\mu$g/L total

Copper $WLA_{chronic}$ $= \frac{21(175 \text{ X } .25) + (21 \text{ X} 18.56)}{18.56} - \frac{175 \text{ X} 5(.25)}{18.56} = 58.72$µg/L dissolved

=58.72 $\mu$g/L dissolved x 1.04 (translator) = 61.07 $\mu$g/L total

Step 2: Determine the LTA

The acute and chronic WLAs are then converted to Long Term Average concentrations ($LTA_a$ and $LTA_c$) using the following equations (or use Table 5-1, page 102 of TSD):

---

[1] Mixing zone - is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. Only the State of Idaho has the regulatory authority to grant a mixing zone.

$LTA_{acute} = WLA_{acute} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$
where,
$\sigma^2 = \ln(CV^2 + 1)$
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation = standard deviation/mean (see Appendix B)
$CV_{chlorine} = .5$
$CV_{ammonia} = .5$
$CV_{copper} = .97$

$LTA_{chronic} = WLA_{chronic} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$

where,
$\sigma^2 = \ln(CV^2/4 + 1)$
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation = standard deviation/mean (see Appendix B)
$CV_{chlorine} = .5$
$CV_{ammonia} = .5$
$CV_{copper} = .97$

Calculate the $LTA_{acute}$ and the $LTA_{chronic}$ :

Chlorine $LTA_{acute}$ = 0.373(63.787 µg/L) = 23.8 µg/L
Chlorine $LTA_{chronic}$ = 0.581(36.930 µg/L) = 21.5 µg/L

Ammonia $LTA_{acute}$ = 0.373(45.084 mg/L) = 16.82 mg/L
Ammonia $LTA_{chronic}$ = 0.581(5.200 mg/L) = 3.02 mg/L

Copper $LTA_{acute}$ = 0.210(102.96 µg/L) = 21.6 µg/L
Copper $LTA_{chronic}$ = 0.382(61.07 µg/L) = 23.3 µg/L

Step 3

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated $LTA_{acute}$ and $LTA_{chronic}$ is used to derive the effluent limitations. The TSD recommends using the 95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL).

Step 4: Determine the Permit Limitations

1. The MDL and the AML would be calculated (or use Table 5-2 of the TSD) as follows:

$MDL = LTA_{chronic} \text{ X } e^{[z\sigma - 0.5\sigma^2]}$
where,

$\sigma^2$ = $\ln(CV^2 + 1)$
z = 2.326 for $99^{th}$ percentile probability basis
CV = coefficient of variation

$AML = LTA_{chronic} \text{ X } e^{[z\sigma - 0.5\sigma^2]}$
where,
$\sigma^2$ = $\ln(CV^2/n + 1)$
z = 1.645 for $95^{th}$ percentile probability basis
CV = coefficient of variation = standard deviation/mean
n = number of sampling events required per month = 4

The exponential term is also called the MDL or AML multiplier and can also be found in Table 5-2 of the Technical Support Document.

With CV = 0.5 for chlorine results in the following multipliers:
Chlorine: MDL multiplier of 2.68, AML multiplier of 1.16 with n=30 and 1.45 if n=4

Chlorine MDL = $LTA_{chronic}$ x 2.68 = 21.456 ug/L x 2.68 = 57.5 ug/L
Chlorine AML = $LTA_{chronic}$ x 1.16 = 21.456 ug/L x 1.16 = 24.9 ug/L

With CV = 0.5 for ammonia results in the following multipliers:
Ammonia: MDL multiplier of 2.68, AML multiplier of 1.45 with n=4 samples per month

Ammonia MDL = $LTA_{chronic}$ x 2.73 = 3.02 mg/L x 2.68 = 8.09 mg/L
Ammonia AML = $LTA_{chronic}$ x 1.46 = 3.02 mg/L x 1.45 = 4.38 mg/L

With CV = 0.97 for copper results in the following multipliers:
Copper: MDL multiplier of 4.77, AML multiplier of 1.92 with n=4 samples per month

Copper MDL = $LTA_{chronic}$ x 4.77 = 21.6 $\mu$g/L x 4.77 = 103.0 $\mu$g/L total
Copper AML = $LTA_{chronic}$ x 1.92 = 21.6 $\mu$g/L x 1.92 = 41.5 $\mu$g/L total

Allowable Loads:

lbs/day = flow (mgd) x concentration (mg/L) x 8.34 (conversion factors)
use flow of 12 mgd (from permit application)

Chlorine maximum daily pounds = 12 x .058 mg/L x 8.34 = 5.8 lbs/day
Chlorine monthly average = 12 x .025 mg/L x 8.34 = 2.5 lbs/day

Ammonia maximum daily pounds = 12 x 8.09 mg/L x 8.34 = 810 lbs/day
Ammonia monthly average = 12 x 4.38 mg/L x 8.34 = 438 lbs/day

Copper maximum daily pounds = 12 x .103 mg/L x 8.34 = 10.3 lbs/day
Copper monthly average = 12 x .042 mg/L x 8.34 = 4.2 lbs/day

The following table lists the effluent limitations for Outfall 001:

TABLE C-1

| OUTFALL 001 | WATER QUALITY-BASED LIMITATIONS | |
|---|---|---|
| | Maximum Daily Limit | Average Monthly Limit |
| Chlorine Concentration | 58 µg/L | 25 µg/L |
| Chlorine Loads | 5.8 lbs/day | 2.5 lbs/day |
| Ammonia Concentration | 8.1 mg/L | 4.4 mg/L |
| Ammonia Loads | 810 lbs/day | 440 lbs/day |
| Copper Concentration | 103 µg/L | 42 µg/L |
| Copper Loads | 10.3 lbs/day | 4.2 lbs/day |

# Appendix D

Pocatello Biosolids Beneficial Recycling/Reuse Site
Agricultural Sites for Land Application

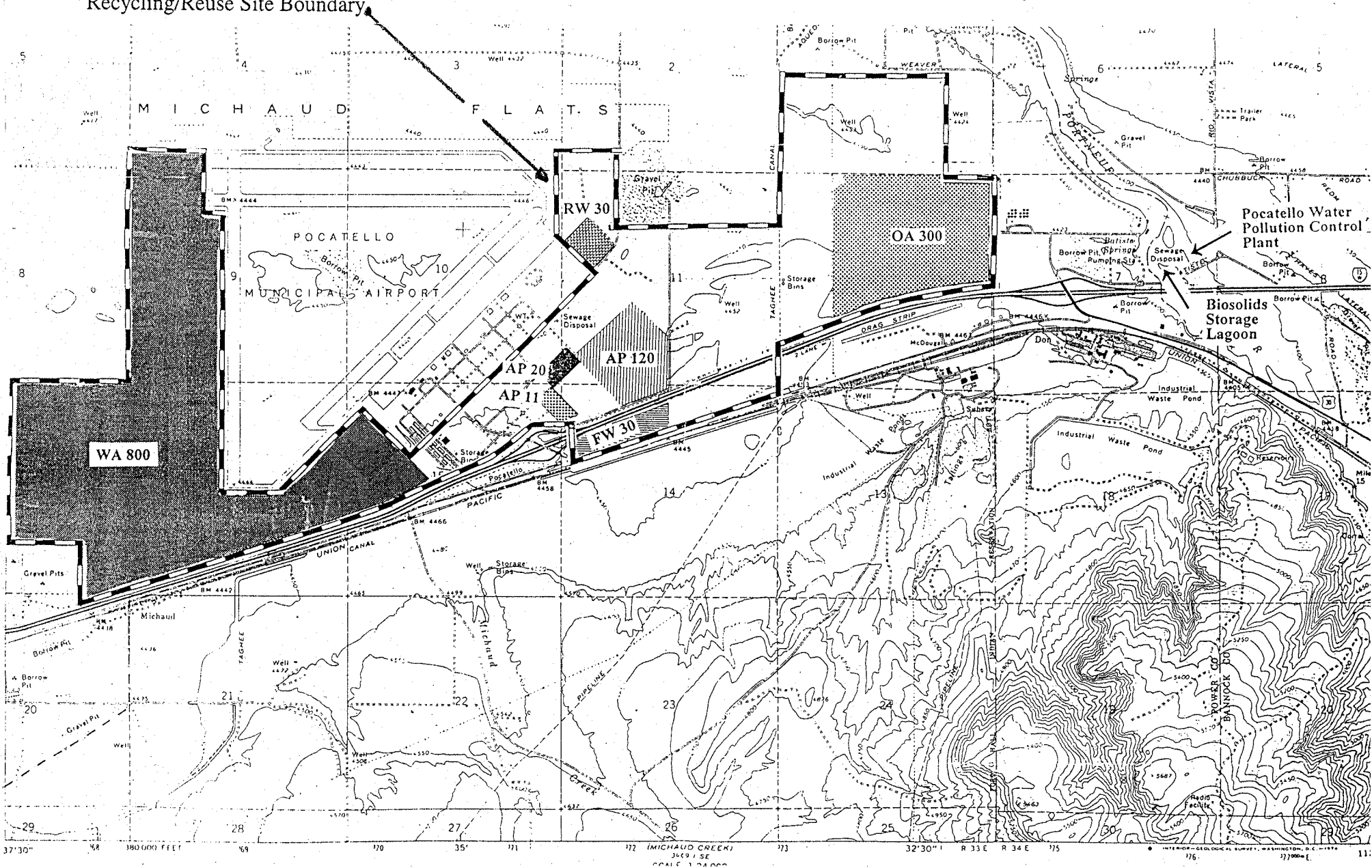
Appendix D

Pocatello Biosolids Beneficial Recycling/Reuse Site
Agricultural Sites for Land Application

| Site Name | Acre-age | Map Reference | Location | | Site Type | Crop |
|---|---|---|---|---|---|---|
| | | | Latitude | Longitude | | |
| Old Airport | 300 | OA 300 | 112°32'30" | 42°55' | Agricultural Land | Wheat, Canola |
| Airport120 | 120 | AP 120 | 112°34' | 42°54' | Agricultural Land | Wheat |
| Airport 20 | 20 | AP 20 | 112°34' | 42°54' | Agricultural Land | Wheat |
| Airport 11 | 11 | AP 11 | 112°34' | 42°54' | Agricultural Land | Alfalfa, Wheat Rotation |
| Freeway 30 | 30 | FW 30 | 112°34' | 42°54' | Agricultural Land | Alfalfa, Wheat Rotation |
| Runway 30 | 30 | RW 30 | 112°34' | 42°55' | Agricultural Land | Alfalfa, Wheat Rotation |
| West Airport 800 | 800 | WA 800 | 112°34' | 42°55' | Agricultural Land | Alfalfa, Wheat Rotation |
| Future Acquired Land | 500 | within site boundary | | | Agricultural Land | Alfalfa, Wheat Rotation |

Appendix D

Pocatello Biosolids Beneficial Recycling/Reuse Site
Agricultural Sites for Land Application



# APPENDIX E

Memorandum from Brent Hokanson, City of Pocatello to Robert Robichaud, U.S. EPA

Subject: "Description of Portneuf River Monitoring Program and Its Application to Revised NPDES Requirements for the Pocatello Water Pollution Control Plan (Permit No. ID-002178-4)"

Date: February 25, 1998

25 February 1998

**To:** Robert R. Robichaud
NPDES Permits Unit, OW-130
U.S. Environmental Protection Agency
Seattle, Washington

**From:** Brent N. Hokanson
Superintendent
Water Pollution Control Department
City of Pocatello, Idaho

**Subject:** Description of Portneuf River Monitoring Program and Its Application to Revised NPDES Requirements for the Pocatello Water Pollution Control Plant (Permit No. ID-002178-4)

## Introduction

The City of Pocatello presently discharges about 7 MGD (12 cfs) of treated wastewater effluent from its Water Pollution Control (WPC) Plant to the Portneuf River. A dominant feature of the lower Portneuf River downstream from Interstate 15 West is numerous springs that emanate within the river's flood plain. The estimated combined flow of these springs is about 280 cfs. During periods of low surface runoff, the majority of flow in the Lower Portneuf River originates as groundwater. Groundwater hydrology and water quality both are important issues with respect to water quality impacts of Pocatello's WPC Plant.

At the time of the last NPDES permit renewal in 1988, toxicity associated with residual chlorine was identified as a potential source of environmental degradation in the receiving stream. As a result of concerns related to chlorine, the Pocatello WPC Plant was upgraded with a dechlorination facility, which is intended to maintain the chlorine residual at non-toxic levels (< 0.5 mg/L) in the effluent. The City of Pocatello is in the process of applying for renewal of its WPC Plant's NPDES permit. Issuance by the USEPA of a draft permit is scheduled for later this year. In order to evaluate if there are any significant deleterious impacts on water quality caused by the Pocatello WPC Plant, the City budgeted and funded a river monitoring study for FY1998. That study is presently underway and will provide critical information related to water quality conditions in the lower Portneuf River.

The purpose of this memorandum is to provide the USEPA with a description of the river monitoring study as it pertains to the draft NPDES permit that will be prepared later this year.

## Background

**Hydrology** - The lower Portneuf River consists of about 13 miles of channel between US Interstate 15 West and the Portneuf's confluence with American Falls Reservoir, an impoundment of the Snake River. The closest upstream gauging station on the Portneuf River is located at Carson Street, a distance of six miles from the Pocatello outfall. As mentioned in the introduction, groundwater accrual to the river channel is significant. Discharge measurements at the Pocatello USGS gauge on Carson Street (USGS Station No. 13075500) do not include influence of the springs, which emanate downstream. Three salient reference points in the lower Portneuf River are bridges located at Batiste Road, Siphon Road, and Tyhee Road (see Figure 1). Figure 2 provides a flow schematic illustrating the relative contributions of water flow to the Portneuf River as estimated for low flow conditions in September 1988. On 1 September 1988, discharge from the Pocatello WPC Plant was 11 cfs, river flow at the Carson Street Gage was 26 cfs, and Portneuf River flow at Siphon Road was 316 cfs. Although detailed seepage studies have yet to be undertaken for the reach, input from springs is estimated to contribute as much as 88% of Portneuf River's flow at Siphon Road during dry year summer minimum flows. Figure 3 depicts the relative contribution to flow at Siphon Road from the various sources, further illustrating the influence of groundwater.

**Water Chemistry** - First appearances would suggest that the cool, clear water from the springs improves water quality in the Lower Portneuf River. Batiste Spring, the largest of the lower Portneuf River springs complex, supports a trout fishing club and trout rearing facility. Upstream of Batiste Road the Portneuf River water quality is degraded to the extent that cold water biota are impaired. The density of game fish downstream of the springs has been found to be greater than that observed upstream (City of Pocatello 1989). The springs however, have a relatively high nutrient load. Results of water chemistry analyses indicate that the springs have ammonia concentrations in the range 0.05 - 6.19 mg/L. Depending on the assumed concentration of ammonia from groundwater, the ammonia load from the springs could exceed that of the Pocatello WPC Plant. Assuming a spring water concentration of 0.97 mg/L, and a background river concentration of 0.3 mg/L, the relative contributions to ammonia load to the Portneuf River are shown in Figure 3.

**Biological Assessment** - Several studies have examined water quality and ecological conditions in the lower Portneuf River. The most comprehensive research report available documented conditions during Fall 1988 and Summer 1989 with respect to water quality, fish and aquatic macroinvertebrates (City of Pocatello, 1989). The study concluded that while environmental impairment was apparent within the plume of the WPC Plant, ecological conditions in the Lower Portneuf were complicated by the presence of cold springs in the area. Although monitoring of the effluent plume was not extensive, the study found dissolved oxygen, pH, and temperature conditions to be within acceptable ranges for the maintenance of cold water biota. Un-ionized

ammonia, however, exceeded USEPA's standard for some samples collected within the effluent plume on some days sampled under low flow, warm weather conditions. Downstream from the effluent discharge point but outside the mixing zone, biotic conditions appeared to be improved compared to upstream. The large volume of relatively cool, clear spring water apparently helped to mitigate possible adverse effects that may be associated with the WPC Plant effluent.

## Description of Portneuf River Monitoring Program

The City of Pocatello is conducting a two-year study of the Portneuf River in the vicinity of the WPC Plant as part of its Facilities Planning activities. The monitoring program is addressing the following objectives, which pertain to the Lower Portneuf River between Batiste and Tyhee Roads:

i. **Groundwater Influence** - Determine the location and discharge of groundwater springs that may affect the discharge of the Portneuf River in the vicinity of the point of discharge of PWPCP

ii. **Effluent Mixing Zone** - Determine the spatial distribution of the mixing zone of the PWPCF effluent under low and average flow conditions. Based on tracer studies specify an appropriate mixing zone consistent with IDAPA 16.01.02.060.

iii. **Monitor River Quality** - Determine water quality characteristics of the Portneuf River especially with respect to conformance with Idaho criteria for dissolved oxygen, temperature, pH, phosphorus, and ammonia. Monitoring will include the PWPCF outfall, the river upstream from the outfall, groundwater flow to the river, the boundary of the mixing zone, and downstream conditions to Siphon Road.

iv. **Data Analysis and Interpretation** - Based on monitoring data collected in this study as well as other available sources, determine the mixing zone for the PWPCF outfall, prescribe appropriate discharge limitations, and if needed recommend a compliance schedule for meeting Idaho water quality criteria. The analysis will include a presentation of appropriate Portneuf River flow and quality conditions for use in setting discharge limitations. Recommend any follow up monitoring that may be appropriate for documenting future impacts of PWPCF effluent on the river.

The primary purposes of the study are to better define the characteristics of the mixing zone and to evaluate whether additional treatment processes (e.g., nitrification) are needed at the WPC Plant in order to meet water quality standards in the Portneuf River.

Table 1 summarizes the constituents and their frequency in the Portneuf River monitoring program. Primary sample stations are Portneuf River at Batiste Rd, WPC

effluent, Portneuf River at Siphon Rd, and selected samples from springs and within the mixing zone.

Table 1. Summary of Portneuf River Monitoring Program

| Constituent | Frequency | Description |
|---|---|---|
| discharge | monthly | measurement at Batiste Rd and Siphon Rd |
| | 1/yr during low flow | intensive groundwater seepage study with multiple measurements to determine accrual |
| water chemistry | one day/month | total alkalinity, carbonaceous BOD, ammonia, nitrite, nitrate, TKN, ortho P, total P, sulfate, TDS, TSS, turbidity |
| | 3/yr during low flow | synoptic samples throughout Batiste to Siphon Rd reach to define mixing zone characteristics |
| field parameters | 2 da/month in winter<br>10 da/month in summer | continuous recording of DO, temp, pH, EC at Batiste Rd, Siphon Rd, and WPC Plant effluent |
| mixing zone | 1/yr | tracer study to determine WPC plant effluent plume and groundwater upwelling |

**Preliminary Results of Monitoring Program**

The City of Pocatello's monitoring program for the Lower Portneuf River collected its first data during January 1998. Data collection is planned on a monthly basis for the period January 1998 - December 1999. Results of continuous monitoring using multiparameter sondes for dissolved oxygen (DO), temperature, and pH are shown in Figures 4-6. Preliminary results of water chemistry are summarized in Table 3. Although these results are provisional and subject to revision they provide an example of the type of data the monitoring program will produce.

Table 2. Preliminary water chemistry results for 15-16 January 1998

| Constituent | Location | Concentration Range (mg/L) |
|---|---|---|
| Total P | Portneuf R. At Batiste Rd | 0.19 |
| | Springs and surface accrual | 0.13 -1.7 |
| | Portneuf R. At Siphon Rd. | 0.58 |
| | WPC Plant Effluent | 0.99-1.2 |
| Ammonia as N | Portneuf R. At Batiste Rd | 0.04 |
| | Springs and surface accrual | 0.01-0.77 |
| | Portneuf R. At Siphon Rd. | 0.44 |
| | WPC Plant Effluent | 15.0-16.0 |
| Nitrite + Nitrate as N | Portneuf R. At Batiste Rd | 1.2 |
| | Springs | 1.2-4.0 |
| | Portneif R. At Siphon Rd. | 1.9 |
| | WPC Plant Effluent | <0.2 |
| Organic Nitrogen | Portneuf R. At Batiste Rd | 0.76 |
| | Springs and surface accrual | <0.3-0.53 |
| | Portneuf R. At Siphon Rd. | 0.46 |
| | WPC Plant Effluent | 3.0-5.0 |
| Total Suspended Solids | Portneuf R. At Batiste Rd | 120 |
| | Springs and surface accrual | 2-6 |
| | Portneuf R. At Siphon Rd. | 89 |
| | WPC Plant Effluent | 11-12 |

## Application of Monitoring Program Results to NPDES Permit Requirements

The Portneuf River monitoring program will provide essential data related to the impact of the Pocatello WPC Plant on the Lower Portneuf River. While the instream biological assessment conducted during 1989 revealed some environmental impairment within the mixing zone of the WPC Plant, no serious water quality degradation was identified attributable to the Plant effluent. The City of Pocatello has initiated the monitoring program in order to evaluate the impacts of its discharge on river water quality. Our goal is to provide a sound technical basis for management decisions related to water quality on the Portneuf River.

The City of Pocatello believes it would be inappropriate to require any significant commitment of resources for further treatment at the WPC Plant until results of the study are available in April 2000.

I would be happy to assist the USEPA with available data and information related to Portneuf River monitoring as the Agency proceeds with work on the draft permit. Please do not hesitate to call me at (208)234-6254 if I can be of assistance.

## References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City of Pocatello 1989. Assessment of possible effects of Pocatello's treated wastewater on the biology and chemistry of the Portneuf River. Final Report prepared for Region X U.S. Environmental Protection Agency by City of Pocatello, Idaho.

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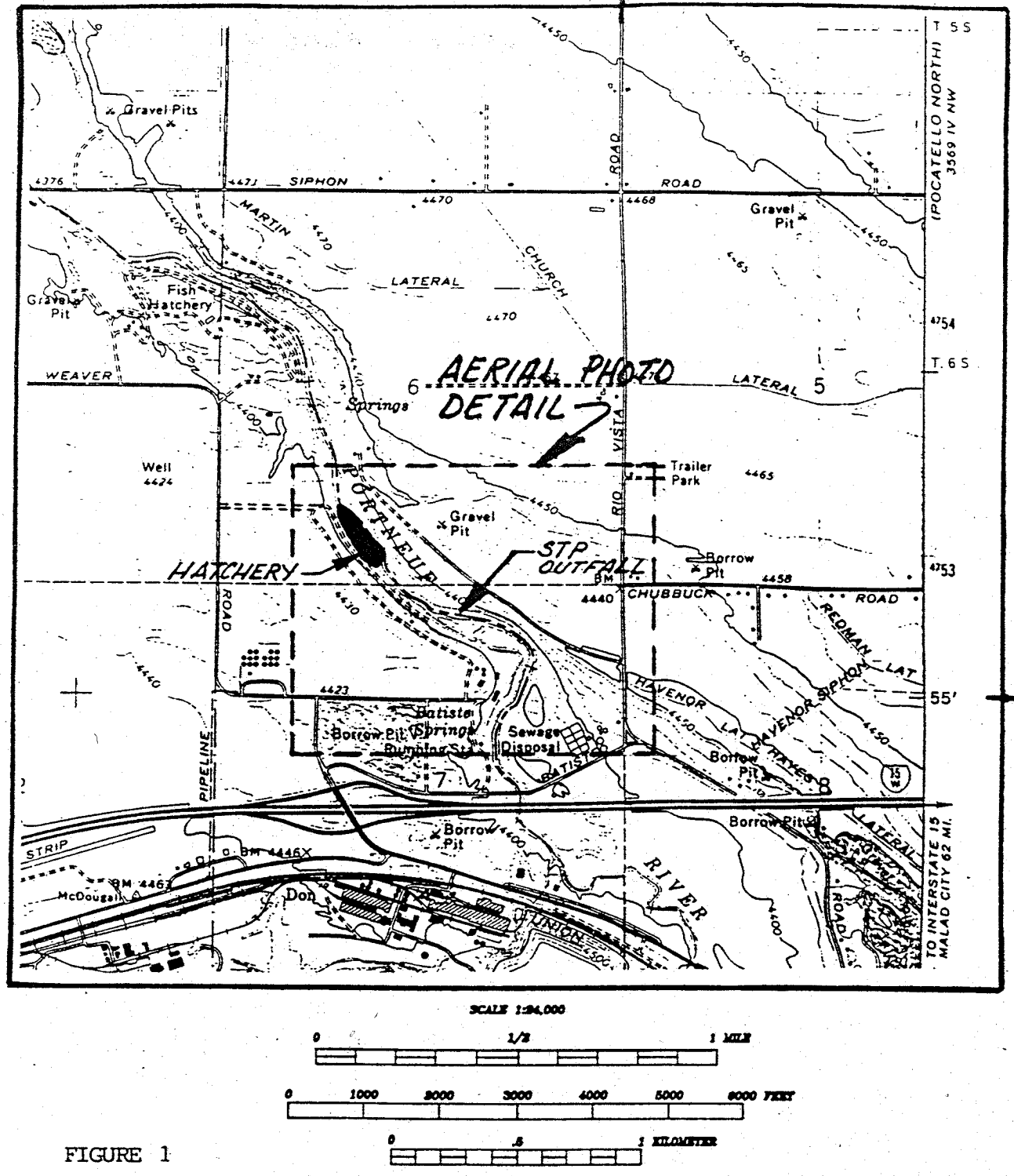



FIGURE 1

*PORTNEUF RIVER IN THE VICINITY OF POCATELLO WASTEWATER TREATMENT PLANT EFFLUENT SHOWING LOCATION OF STUDY SITES USED FOR THE FALL OF 1988 BIOASSESSMENT.*
*BASE MAP IS USGS POCATELLO NORTH, IDAHO– 7.5 MINUTE QUADRANGLE (1971)*

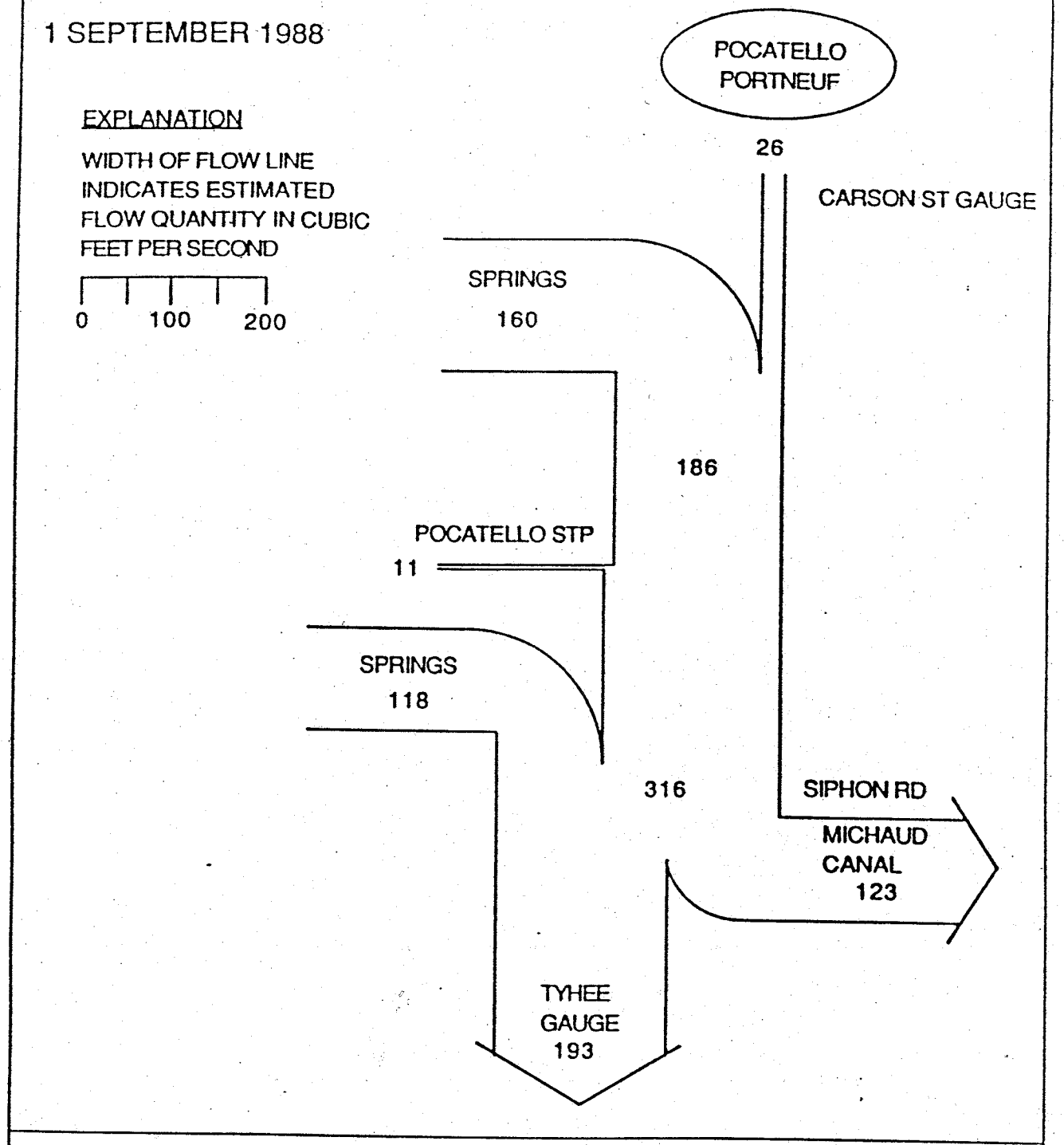
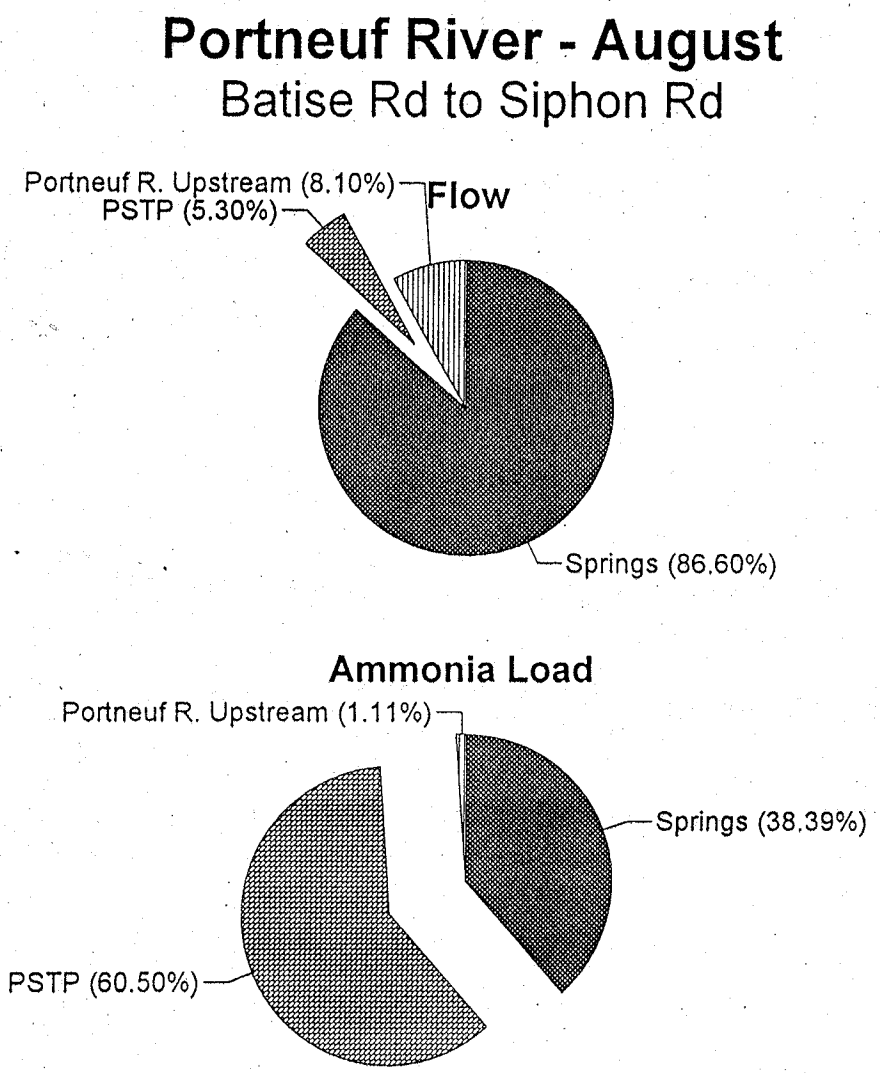



FIGURE 1-4 Estimated flow quantity (cfs) of Lower Portneuf River on 1 September 1988.

Note: Sources of data, U.S. Geological Survey, Fort Hall Michaud Canal, City of Pocatello, Idaho State University

Figure 2

**Figure 3** . Estimated flow and ammonia loading to Portneuf River during August base flow conditions

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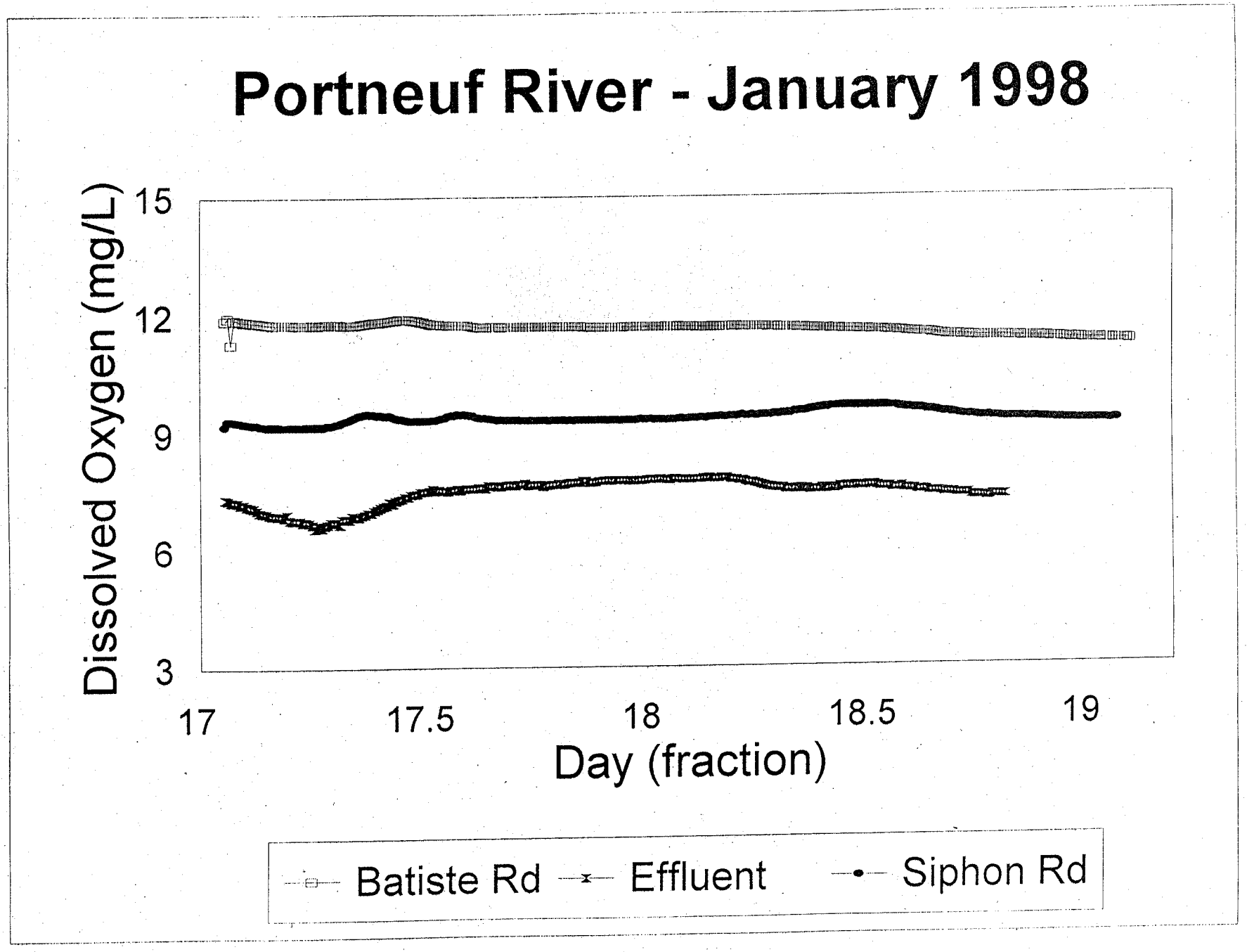


Figure 4

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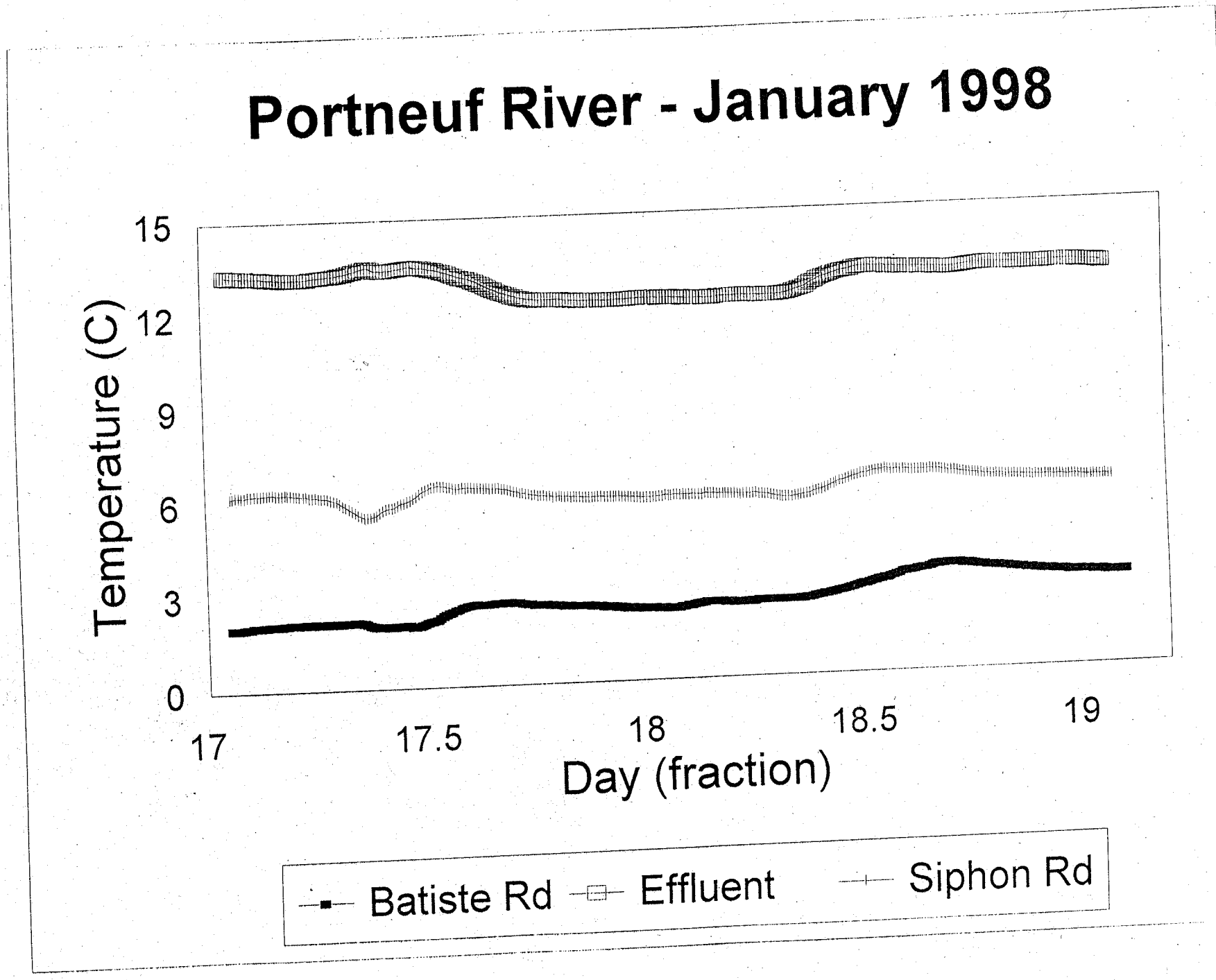


Figure 5

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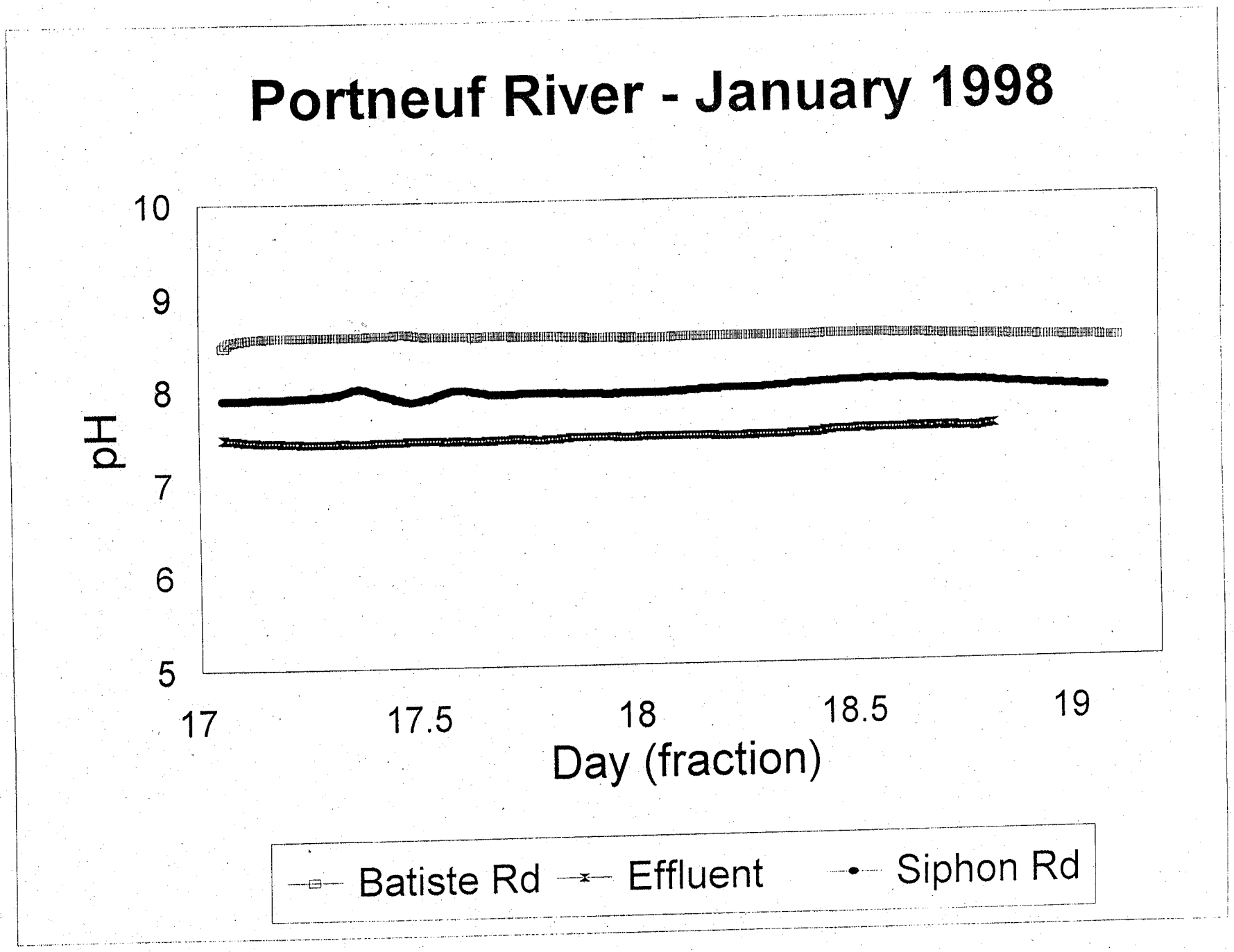


Figure 6

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