Fact Sheet

Permit Number: ID-002279-9
Public Notice start date: November 24, 2010
Public Notice expiration date: December 27, 2010
Technical Contact: Kai Shum, (206) 553-0060
1-800-424-4372 (within Region 10)
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The United States Environmental Protection Agency (EPA) Plans to Issue a National Pollutant Discharge Elimination System (NPDES) Permit to

City of Kamiah
Wastewater Treatment Plant
1775 Laguna Drive
Kamiah, Idaho 83536

EPA Proposes NPDES Permit Issuance.

EPA proposes to issue an NPDES permit to the City of Kamiah's Wastewater Treatment Plant. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to Clearwater River. 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.

This Fact Sheet includes:

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

EPA Region 10 Proposes Certification.

EPA is certifying the NPDES permit for the City of Kamiah Wastewater Treatment Plant, under Section 401 of the Clean Water Act. The physical location and discharge from this Wastewater Treatment Plant is within the boundaries of the Nez Pierce Reservation.

Public Comment

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

EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, EPA=s Director for the Office of Water and Watersheds will make a final decision regarding permit reissuance.

Persons wishing to comment on the proposed permit or on EPA Certification should submit written comments by the Public Notice expiration date to the U.S. Environmental Protection Agency, Region 10, 1200 Sixth Avenue, Suite 900 (OWW-130), Seattle, Washington 98101.

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.

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
http://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900 (OWW-130)
Seattle, Washington 98101
(206) 553-2108 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The Fact Sheet and draft permit are also available at:

City of Kamiah
Wastewater Treatment Plant
1775 Laguna Drive
Kamiah, Idaho 83536
Attention: Mike Stanton
Phone: (208) 935-2406
Cell: (208) 935-5010

United States Environmental Protection Agency
Idaho Operations Office
1435 North Orchard
Boise, Idaho 83706
(208) 378-5746

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Facility Name: City of Kamiah Wastewater Treatment Plant

NPDES Permit Number: ID0028002

Facility Location Address:
1775 Laguna Drive
Kamiah, Idaho 83536

Facility Mailing Address:
P.O. Box 338
Kamiah, Idaho 83536

Facility Contact: Mike Stanton, Wastewater Treatment Plant Operator, (208) 935-2406
Applicant Contact: Dale Schneider, Mayor, (208) 935-2672

II. FACILITY INFORMATION

The City of Kamiah is located in the Clearwater Basin, Lewis County, Idaho, at approximately 1,240 feet elevation. According to the Wastewater Treatment Plant Operator on January 13, 2010, the City of Kamiah, the Nez Perce Tribe, Pine Ridge and Valley View Sewer Districts discharge wastewater to the Kamiah Wastewater Treatment Plant. The City of Kamiah had submitted an application dated April 27, 2007, for the reissuance of a NPDES Permit; revised information was received from the operator on January 15, 2010.

The treatment plant is located on the Nez Perce Indian Reservation and provides service to the City of Kamiah, the Nez Perce Tribe, and the Pine Ridge and Valley View Sewer Districts. The facility serves a population of approximately 1,933 according to its application. A map has been included in Appendix A which shows the location of the treatment plant and the discharge location.

The facility is a mechanical treatment plant with grit removal, fine screen, activated sludge treatment, clarification, and ultraviolet disinfection prior to discharging to the Clearwater River. The facility has a design flow of 0.613 million gallons per day (mgd). The facility was constructed and came on-line in August 2003 to replace an existing lagoon system. According to the Wastewater Treatment Plant Operator (on January 13, 2010), that there had not been any operational changes after the plant had been constructed. Additional information on the wastewater treatment system is included in Appendix A.

The Kamiah WWTP receives domestic wastewater from residential and commercial sources. There are no industrial sources. The collection system has no combined stormwater with sanitary wastewater sewers. The WWTP utilizes a 0.613mgd activated sludge system. The facility consists of the following unit operations: primary screen, first-stage aeration tank, second-stage aeration tank, clarifier, and in-line UV disinfection. In addition, the treatment of sludge generated at this facility consists of the following unit operations: digester and dewatering unit. A process flow diagram has been included in Appendix A which shows the processes of the treatment plant, including all bypass piping and all redundancy in the system.

According to the application and the revised update, the designed flow rate of the plant is 0.613mgd, as compared to its annual average daily flow rate of 0.140mgd in 2005, 0.144mgd in 2006, and 0.124mgd in 2009. Correspondingly, the maximum daily flow rate was 0.276mgd in 2005 and 0.257mgd in December 2009. This indicates that the plant was operating at below its designed flow rate.

The collection system used by the treatment plant consists only of a separate sanitary sewer system, and the plant discharges from one outfall into the Clearwater River. The plant does not discharge into basins, ponds or other surface impoundments, it does not land apply treated wastewater, and the plant does not transport treated (or untreated) wastewater to another treatment works. This treatment plant is designed with secondary treatment, with over 90% removal of both biochemical oxygen demand (BOD) and suspended solids (SS); and, this plant is equipped with an ultraviolet (UV) disinfection system.

According to its application, it was estimated that the city’s collection system has an inflow and infiltration rate of 23,000 gallons per day, and the city had planned to perform smoke testing and remote visual inspection to locate and/or to eliminate infiltration sources.

During the development of the proposed permit, EPA conducted formal tribal consultation with the Nez Perce Tribe because the Kamiah Wastewater Treatment Plant discharges into tribal waters located within the reservation boundary. EPA has communicated with Darryl Reuben, the Utilities Supervisor at the Nez Perce Tribe, and has written to Nez Perce Chairman McCoy Oatman in a letter dated July 2, 2010. On August 3rd, 2010, the Nez Perce Tribe through Darryl Reuben, indicated that they did not have any comments on the Preliminary Draft Fact Sheet, the Preliminary Draft Permit or their subsequent revisions.

III. RECEIVING WATER

The treated effluent from the City of Kamiah WWTP discharges from one outfall, named, Outfall 001, located at latitude 46E14'14" N and longitude 116E01'42" W, into the Clearwater River. The outfall is not equipped with a diffuser, and the point of discharge in the Clearwater River is located within the boundaries of the Nez Perce Indian Reservation. The Clearwater

River, is a substantially sized waterbody, and is a tributary to the Snake River.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the Idaho WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria.

EPA used all daily flow data available from USGS station #13339000 (1912 to 1965) and the DFLOW computer program to calculate the critical low flows of Clearwater River at Kamiah, Idaho. USGS station #13339000 is located at latitude 46° 13'58" N, longitude 116° 01'21" W (Rev.) (NAD83), in SW1/4 NE1/4 sec.1, T.33 N., R.3 E., Lewis/Idaho County line, Kamiah quad., Hydrologic Unit 17060306, Nez Perce Indian Reservation, on left bank 0.25 mi downstream from highway bridge at Kamiah, 0.75 mi downstream from Lawyer Creek, 6 mi downstream from South Fork, and at river mile 67.0. Data were available from 1912 to 1965. These are the calculated low flows: 1Q10 is 481cfs, 7Q10 is 672cfs and 30B3 is 889cfs.

B. Water Quality Standards

Section 301(b)(1)(C) of the Clean Water Act (Act) requires that NPDES permits contain effluent limits necessary to meet water quality standards. A State/Tribe's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as cold water biota, contact recreation, etc.) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State/Tribe to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

The Nez Perce Tribe has not applied for the status of Treatment as a State (TAS) from the EPA for purposes of the Clean Water Act. When the Nez Perce Tribe is granted TAS, and when it has Water Quality Standards (WQS) approved by EPA, those tribal WQS will be used for determining effluent limitations. Meanwhile, the Idaho WQS were used as reference for setting permit limits, and to protect downstream uses in the State of Idaho.

The criteria that the State of Idaho has deemed necessary to protect the beneficial uses for the Clearwater River are provided in the basis for effluent limitations. In reference to IDAPA 58.01.02.120.08, HUC 17060306, Clearwater Subbasin, Unit C-22, "Clearwater River – confluence of South and Middle Fork Clearwater Rivers to Lolo Creek", this segment has the following use designations:
Cold – Cold Water Communities: water quality appropriate for the protection and maintenance

of a viable aquatic life community for cold water species.
SS – Salmonid Spawning: waters which provide or could provide a habitat for active self-propagating populations of salmonid fishes.
PCR – Primary Contact Recreation: water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to, those used for swimming, water skiing, or skin diving.
DWS – Domestic Water Supply: water quality appropriate for drinking water supplies.
SRW – Special Resource Water

The Idaho Water Quality Standards state that all waters of the State of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c), wildlife habitats (100.04) and aesthetics (100.05). The WQS also state, in Section 252.02 that the criteria from *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA-R3-73-033) can be used to determine numeric criteria for the protection of the agricultural water supply use.

In addition, the Idaho *Water Quality Standards* state that the following general water quality criteria apply to all surface waters of the state, in addition to the water criteria set forth for specifically designated waters:

Hazardous Materials (Section 200.01);
Toxic Substances (Section 200.02);
Deleterious Materials (Section 200.03);
Radioactive Materials (Section 200.04);
Floating, Suspended or Submerged Matter (Section 200.05);
Excess Nutrients (Section 200.06);
Sediment (Section 200.07); and
Natural Background Conditions (Section 200.09)

There is no information indicating the presence of existing beneficial uses other than those that are designated. Therefore, the permit ensures a level of water quality necessary to protect the designated uses and, in compliance with IDAPA 58.01.02.051.01, also ensures that the level of water quality necessary to protect existing uses is maintained and protected**.** If EPA receives information during the public comment period demonstrating that there are existing uses for which this segment of the Clearwater River is not designated, EPA will consider this information before issuing a final permit and will establish additional or more stringent effluent limitations if necessary to ensure protection of existing uses.

Section 303(d) of the Clean Water Act requires listings of waters that are not attaining water quality standards. This is known as the list of impaired waters. There is no Section 303(d) listing for this segment of the Clearwater River where the facility discharges. There is also no Total Maximum Daily Load (TMDL) for the receiving water.

IV. PROPOSED EFFLUENT LIMITATIONS

A. Basis for Permit Effluent Limits

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. A technology-based effluent limit requires a minimum level of treatment for municipal point sources based on currently available treatment technologies. A water quality-based effluent limit is designed to ensure that the water quality standards of a water body are being met. The basis for the proposed effluent limits in the draft permit is located in Appendix B.

B. Proposed Effluent Limitations

Table 1 and the following list summarizes the effluent limitations that are in the draft permit:

The effluent pH range must be between 6.5 and 9.0 standard units (s.u.).
For BOD_5 and TSS, the monthly average percent removal shall not be less than 85 percent.
There must be no discharge of floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.

Table 1: Proposed Effluent Limitations for Outfall 001

Parameter	Unit	Average Monthly	Average Weekly	Maximum Daily
E. Coli Bacteria	#/100 ml	126[1]	126[1]	281[2]
BOD_5	mg/l	30	45	---
	lbs/day[4]	18[4]	28[4]	---
	% removal[3]	85% (min.) [3]	---	---
TSS	mg/l	30	45	---
	lbs/day[4]	18[4]	28[4]	---
	% removal[3]	85% (min.) [3]	---	---
pH	s.u.	6.5 to 9.0		
<u>Footnotes</u>:				

Table 1: Proposed Effluent Limitations for Outfall 001

Parameter	Unit	Average Monthly	Average Weekly	Maximum Daily

1. Average Monthly Limit for E. coli: The permittee must report the geometric mean for e-coli concentration. If any value used to calculate the geometric mean is less than 1, the permittee must round that value up to 1 for purposes of calculating the geometric mean. Based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
3. Percent removal is calculated using the following equation:
   ((average monthly influent – average monthly effluent)) average monthly influent) x100
4. Listed loading limits are retained from the previous permit. See Fact Sheet pages 10 and 23.

C. Statutory Prohibitions on Backsliding

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

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

All the limits in the proposed permit are at least as stringent as the previous permit, therefore, this proposed permit meets backsliding requirements.

BOD_5 and TSS

In the proposed permit, BOD and TSS concentration and loading limits are retained from the previous permit. EPA is aware that the previous permit limit for loading was calculated in error by a factor of 8.34. However, in the absence of an approved antidegradation implementation procedures in Idaho, and because the facility has been consistently in compliance with the BOD and TSS loading limits, and does not appear to need an increased loading limit at this time, EPA has determined that the previous loading limits be retained to comply with antidegradation and anti-backsliding regulations. Section 402(o)(1) of the act restricts the establishment of less stringent effluent limits in reissued permits, for effluent limits based on Sections 301(b)(1)(C), 303(d), 303(e), and 402(a)(1)(B), meaning water quality-based effluent limits and technology-based effluent limits based on best professional judgment. When approved antidegradation implementation procedures are in place (regulations are currently being developed by IDEQ), upon petition from the facility having provided the required documentation to comply with those approved procedures, and based on the facility's need, EPA will consider modifying the loading limits either through a permit modification or at a time of reissuance of the next permit.

The technology-based concentration effluent limits for TSS and BOD_5 in both the 2002 final permit and the draft permit are based on Section 301(b)(1)(B) of the Act.

E.Coli Bacteria and pH

E.Coli bacteria and pH limits in the proposed permit are unchanged from the previous permit, therefore, this proposed permit complies with anti-backsliding for these two parameters.

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

Because the E. coli limits apply current water quality criteria at the end-of-pipe, the effluent limits are derived from and comply with water quality standards for E. coli. The secondary treatment technology-based effluent limits do not include effluent limits for bacteria. Because the effluent limits will continue to ensure that water quality standards are met and do not violate the secondary treatment effluent limits, the limits proposed limits comply with Section 402(o)(3) of the CWA.

D. Antidegradation

Overview

EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure compliance with State water quality standards, including antidegradation requirements. The fact that the State of Idaho has not identified methods for implementing its antidegradation policy does not necessarily prevent EPA from establishing such permit conditions.

The City of Kamiah NPDES permit contains limits as stringent as necessary to ensure compliance with all applicable water quality standards, including Idaho's antidegradation policy (IDAPA 58.01.02.051). As explained in detail below, the reissued permit ensures that "the existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected" consistent with the requirements of 40 CFR 131.12(a)(1) and IDAPA 58.01.02.051.01. Relative to the prior permit issued in 2002, the reissued permit does not allow lower water quality for those parameters where the receiving water quality “exceeds levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water,” therefore, the reissued permit maintains and protects the existing level of water quality, consistent with 40 CFR 131.12(a)(2) and IDAPA 58.01.02.051.02. Finally, the antidegradation policy for outstanding resource waters is inapplicable in this reissued permit because no waters of the State of Idaho are designated as “outstanding resource waters” (IDAPA 58.01.02.051.03).

The draft reissued permit ensures compliance with the State of Idaho’s antidegradation policy and CWA regulations because the permit conditions ensure protection of existing uses and do not allow lower water quality relative to the prior permit. Under the circumstances of this draft reissued permit, EPA may issue an NPDES permit even though the State has not yet identified methods for implementing its antidegradation policy. In its antidegradation analysis below, EPA determined compliance with Idaho’s antidegradation requirements.

EPA Antidegradation Analysis

Protection of Existing Uses (IDAPA 58.01.02.051.01 and 40 CFR 131.12(a)(1))

The effluent limits in the draft permit ensure compliance with applicable numeric and narrative water quality criteria. The numeric and narrative water quality criteria are set at levels that ensure protection of the designated uses. As there is no information indicating the presence of existing beneficial uses other than those that are designated the draft permit ensures a level of water quality necessary to protect the designated uses and, in compliance with IDAPA 58.01.02.051.01 and 40 CFR 131.12(a)(1), also ensures that the level of water quality necessary to protect existing uses is maintained and protected. If EPA receives information during the public comment period demonstrating that there are existing uses for which the Clearwater River is not designated, EPA will consider this information before issuing a final permit and will establish additional or more stringent effluent limitations if necessary to ensure protection of existing uses.

High Quality Waters (IDAPA 58.01.02.051.02 and 40 CFR 131.12(a)(2))

The City of Kamiah WWTP discharges to a segment (assessment unit) of the Clearwater River that is considered high quality for all of the pollutants of concern. As such, the quality of the Clearwater River must be maintained and protected, unless it is deemed appropriate and necessary to allow a lowering of water quality (IDAPA 58.01.02.051.02, 40 CFR 131.12(a)(2)).

All of the effluent limits in the reissued permit are as stringent as the corresponding limits in the prior (2002) permit. Because the limits are as stringent as the corresponding limits in the prior permit, the reissued permit will not allow lower water quality for pollutants that were limited in the prior permit. .

As to those pollutants present in the discharge without effluent limits in both the reissued permit and the prior permit, there is no factual basis to expect that those pollutants will be discharged in greater amounts under the reissued permit than were authorized in the prior permit. Similarly, there is no factual basis to expect that the effluent contains any new pollutants that have not been discharged previously. EPA reached these conclusions because the permit application and the discharge monitoring report data indicate no changes in the design flow, influent quality or treatment processes that could result in a new or increased discharge of pollutants.

Summary

As explained above, the effluent limits in the draft reissued permit are adequately stringent to ensure that existing uses are maintained and protected, in compliance with IDAPA 58.01.02.051.01 and 40 CFR 131.12(a)(1).

Furthermore, the reissued permit will not authorize an increased discharge of any pollutants that were not subject to effluent limits under the prior permit.

The reissuance of the NPDES permit for the City of Kamiah WWTP will therefore not allow lower water quality relative to the prior permit, and will be in compliance with IDAPA 58.10.02.051.02 and 40 CFR 131.12(a)(2). Consequently, there is no need for the State of Idaho to make a finding that “allowing lower water quality is necessary to accommodate important economic or social development” under IDAPA 58.01.02.051.02. Under these circumstances, EPA may issue an NPDES permit even though the State of Idaho has not yet identified methods for implementing its antidegradation policy.

V. PROPOSED MONITORING REQUIREMENTS

A. Basis for Effluent and Receiving Water Monitoring

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) require effluent monitoring in NPDES permits to determine compliance with effluent limitations. Section 308 also allows additional effluent and receiving water monitoring to gather data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports to EPA.

B. Proposed Effluent Monitoring

Monitoring frequencies are retained from the previous permit with the addition of one additional parameter, phosphorus. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6, and where each test is conducted in a separate permit year during the permitted discharge period for the first three years of the permit cycle. Note that several parameters named in Part B.6 which are required to be monitored are not named individually on this table. Table 2 presents the proposed effluent monitoring requirements for the draft permit.

Table 2: Proposed Effluent Monitoring for Outfall 001				
Parameter	Unit	Location[1]	Sample Frequency	Sample Type
BOD_5	mg/l	influent and effluent	1/week	24-hour composite
	% removal			calculation[2]
	lbs/day			calculation[3]
TSS	mg/l	influent and effluent	1/week	24-hour composite
	% removal			calculation[2]
	lbs/day			calculation[3]
Flow	Mgd	effluent	continuous	Recording
E. Coli Bacteria[4]	colonies/100 ml	effluent	5/month[4]	grab[4]
pH	s.u.	Effluent	5/week	Grab
Temperature	EC	effluent	5/week	Grab
Dissolved Oxygen	mg/l	effluent	2/week	Grab
Total Phosphorus[5] as P	mg/l	Effluent	1/quarter	Grab
Total Ammonia[5] as N	mg/l	effluent	1/quarter	24-hour composite
NPDES	mg/l	Effluent	3x /5 years	See

Table 2: Proposed Effluent Monitoring for Outfall 001

Parameter	Unit	Location[1]	Sample Frequency	Sample Type
Application Form 2A Effluent Testing Data[6] in mg/l				Footnote 6

Footnotes:

1. Influent and effluent samples must be collected during the same 24-hour period.
2. Percent removal is calculated using the following equation:
((Average monthly influent – average monthly effluent) x 100) ÷ (average monthly influent)
3. Loading is calculated by multiplying the concentration in mg/L by the average daily flow for the day of sampling in mgd and a conversion factor of 8.34. If the concentration is measured in μg/L, the conversion factor is 0.00834. For more information on calculating, averaging, and reporting loads and concentrations see the NPDES Self-Monitoring System User Guide (EPA 833-B-85-100, March 1985).
4. Average Monthly Limit for E. coli: The permittee must report the geometric mean for e-coli concentration. If any value used to calculate the geometric mean is less than 1, the permittee must round that value up to 1 for purposes of calculating the geometric mean. Based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period. See Part VI for a definition of geometric mean.
5. The maximum Method Detection Limit (MDL): for Total Ammonia is 0.05 mg/l, and for Total Phosphorus is 0.01mg/l.
6. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6, and where each test is conducted in a separate permit year during the permitted discharge period for the first three years of the permit cycle. Note that several parameters named in Part B.6 which are required to be monitored are not named individually on this table.

C. Proposed Receiving Water Monitoring

Upstream receiving water monitoring for temperature, pH and Total Ammonia are retained from the previous permit. Total Phosphorus and Dissolved Oxygen are proposed for both upstream and downstream surface water monitoring to determine if effluent limits are warranted in the next permitting cycle. Grab sampling is proposed instead of composite sampling because the WWTP Operator informed EPA on January 13, 2010 that it is not possible to approach the opposite bank on the downstream side due to private property. Therefore, all upstream receiving water samples continue to be composite sampling, and all downstream receiving water monitoring are to be grab samples taken from the facility’s side of the river. The proposed receiving water monitoring requirements for the draft permit are provided in Table 3.

Table 3: Proposed Receiving Water Monitoring

Parameter	Unit	Location	Sample Frequency	Sample Type	Max. Method Detection Limit
Temperature	EC	upstream	1/quarter	Composite	---
pH	s.u.	upstream	1/quarter	Composite	---
Total Ammonia as N	mg/l	upstream	1/quarter	Composite	0.05 mg/l
Dissolved Oxygen	mg/l	Upstream and downstream	1/quarter	Composite for Upstream, and Grab for Downstream	---
Total Phosphorus as P	mg/l	Upstream and downstream	1/quarter	Composite for Upstream, and Grab for Downstream	0.01 mg/l

VI. SPECIAL CONDITIONS

A. Quality Assurance Plan (QAP)

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The Kamiah WWTP is required to update the Quality Assurance Plan for the WWTP within 90 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained on site and made available to EPA, and Nez Perce Tribe upon request.

B. Operation and Maintenance Plan

The permit requires the WWTP to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 90 days of the effective date of the final permit. The plan shall be retained on site and made available to EPA and Nez Perce Tribe upon request.

C. Pretreatment Requirements

The facility certified in its permit application that it does not receive Industrial User Discharges and RCRA/CERCLA Wastes; therefore, no pretreatment requirements are proposed in the draft permit. In addition, the design flow of the treatment plant is less than 5 mgd, therefore, EPA does not believe it is necessary to develop a pretreatment program for EPA’s approval at this time. However, the permit contains conditions requiring that the facility monitor and control industrial users.

D. Standard Permit Provisions

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

E. Sludge (biosolid) Requirements

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

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State’s biosolids program. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

VII. OTHER LEGAL REQUIREMENTS

A. Certification Requirements

Since this permit authorizes the discharge into Nez Perce tribal waters, EPA will provide Section 401 certification under the Clean Water Act

B. Standard Permit Provisions

Sections II, III, and IV of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

C. Endangered Species Act of 1973

Section 7 of the Endangered Species Act requires Federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that the issuance of this permit will have no effect on any of the threatened or endangered species in the vicinity of the discharge. See Appendix D for further details.

D. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action.

E. Permit Expiration

Section 402(1)(B) of the Clean Water Act require that NPDES permits are issued for a period not to exceed five years, therefore, this permit will expire five years from the effective date of the permit.

VIII. REFERENCES

EPA, 1991. *Technical Support Document for Water Quality-based Toxics Control*. U.S. Environmental Protection Agency, Office of Water, 3PA\505\2-90-001, March, 1991.

EPA Region 10, 1996. *EPA Region 10 Guidance for WQBEL Below Analytical Detection/Quantitation Level*, U.S. Environmental Protection Agency, Region 10, Office of Water, March 22, 1996.

NPDES Permit and Factsheet, July, 2002. Permit issued to City of Kamiah Sewage Treatment Plant by EPA Region 10, signed on July 12, 2002.

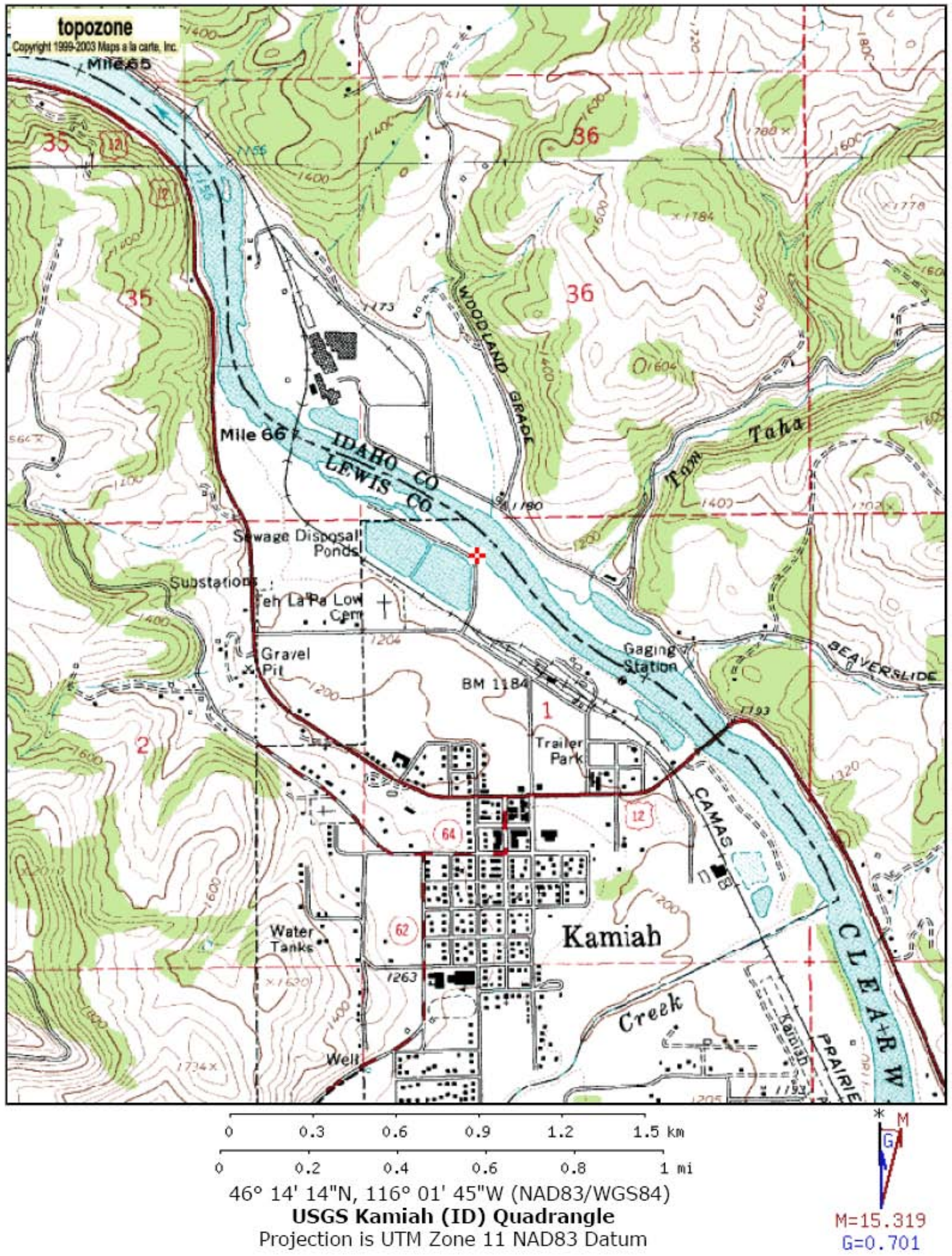
IDAPA, 2006. *Idaho Administrative Procedures Act 58, Title 01, Chapter 02: Water Quality Standards and Wastewater Treatment Requirements*. Idaho Department of Environmental Quality, IDAPA 58.01.02.

IDEQ, 2009. *City of Kamiah WWTP Draft NPDES Permit*, Idaho Department of Environmental Quality. Jennifer Wester, January 2009.

Appendix A: Facility Information

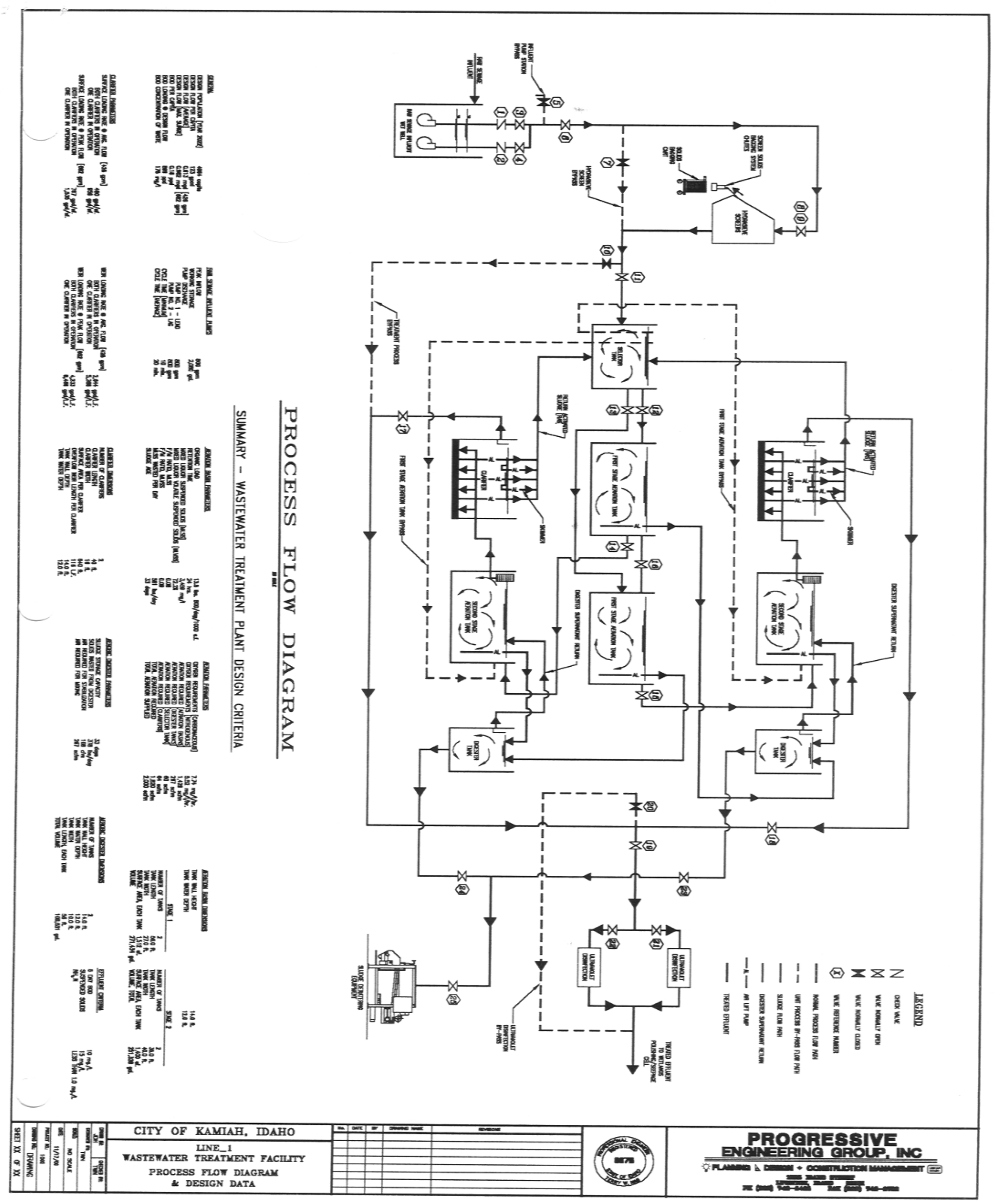
General Information	
NPDES ID Number:	ID-002800-2
Physical Location of Treatment Plant:	1775 Laguna Drive, Kamiah, Idaho. Located north of No Kid Road on the north side of Kamiah, Idaho
Physical Location of Discharge:	Clearwater River near Laguna Drive
Mailing Address:	P.O. Box 338 Kamiah, ID 83536
Facility Information	
Type of Facility:	Municipal Wastewater Treatment Plant
Treatment Train:	Grit removal, fine screen, activated sludge treatment, clarification, ultraviolet disinfection.
Biosolids (Sludge) Handling:	Thickening, anaerobic or aerobic digestion, dewatering, landfill or land application.
Flow:	Design flow rate is 0.613 mgd.
Outfall Location:	Outfall 001: latitude 46º 14' 14" N; longitude 116º 01' 42" W
Receiving Water Information	
Receiving Water:	Clearwater River
Watershed:	Clearwater Subbasin (HUC 17060306), IDADA 58.01.02.120.08, water body unit, C-22 – "Clearwater River – confluence of South and Middle Fork Clearwater Rivers to Lolo Creek"
Beneficial Uses:	Cold Water Communities Salmonid Spawning Primary Contact Recreation Domestic Water Supply Special Resource Water industrial and agricultural water supply (Section 100.03.b, c.) wildlife habitats (100.04) aesthetics (100.05).

Figure A-1: Facility Location Map



Note: The former “Sewage Disposal Ponds” shown in on the map is the present location of Kamiah Wastewater Treatment Plant.

Figure A-2: Process Flow Diagram



Appendix B: Basis for Effluent Limits

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

Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

In sections 301(b)(1)(B) and 304(d)(1), the Act established a performance level, referred to as "secondary treatment," which all POTWs are required to meet. EPA developed and promulgated "secondary treatment" regulations that are found in 40 CFR 133. These technology-based effluent limits apply to all municipal wastewater treatment plants, and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD_5 TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table C-1.

Table B-1: Secondary Treatment Effluent Limits (40 CFR 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5 and TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

Chlorine

The City of Kamiah Wastewater Treatment Plant uses ultraviolet radiation for disinfection. Chlorine is not used, therefore, no technology-based chlorine limits are applicable to this discharge.

Mass-Based Limits

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

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

In this case, for the monthly average technology-based BOD_5 and TSS effluent limits (30 mg/L):

---

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

30 mg/L × 0.613 mgd × 8.34 = 153.37 lb/day

In the case for the weekly average technology-based BOD_5 and TSS effluent limits (45 mg/L):

45 mg/L × 0.613 mgd × 8.34 = 230.06 lb/day

However based on a lack of approved antidegradation procedures in Idaho, the loading limits are retained from the previous permit and are expressed in Table 1.

Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the water quality standards of all affected States. The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality.

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

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed based on numeric criteria, EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it is appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body, and decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the receiving water meets the criteria necessary to protect the designated uses of the water body.

Procedure for Deriving Water Quality-based Effluent Limits

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

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the mixing zone is not authorized, then the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permitted discharge will not cause an excursion above the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

Facility-Specific Water Quality-based Effluent Limits

pH

The most stringent water quality criteria for pH are for the protection of aquatic life uses. The pH criteria for these uses state that the pH must be no less than 6.5 and no greater than 9.0 standard units. The upper bound of the water quality criteria is equal to the upper bound of the technology-based pH limits (9.0 standard units). Therefore, the pH of the effluent could not be greater than 9.0 standard units regardless of the discharges’ effects on the receiving water and whether a mixing zone were authorized. EPA has determined that the effluent pH must be at least 6.5 standard units in order to ensure that water quality standards for pH are met in the receiving water. Therefore, the proposed pH effluent limits are a range of 6.5 to 9.0 standard units at all times. The proposed pH effluent limits are unchanged from the previous permit.

Ammonia

EPA has determined that the discharge does not have reasonable potential to cause or contribute to excursions above water quality standards for ammonia. Therefore, EPA has not calculated water quality-based effluent limits for ammonia (see Appendix D).

E. Coli

IDAPA 58.01.02.251.01, Surface Water Quality Criteria for Recreation use Designations, states that waters designed for recreation are not to contain E. coli bacteria, used as indicators of human pathogens, in concentrations exceeding:

Geometric Mean Criterion is applied for this parameter. Waters designated for primary or secondary contact recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of 126 E. coli organisms per 100 ml based on a minimum of 5 samples taken every 3 to 7 days over a 30-day period. In addition, for waters designated as primary contact recreation, a single sample maximum of 406 E. coli organisms per 100 ml.

The previous permit required that E.Coli bacteria levels do not exceed 126 organisms per 100 ml for both the geometric mean of both the average weekly and monthly limits, and 281 organisms per 100ml as the Daily Maximum Limit. These effluent limits are retained in the proposed permit to comply with anti-backsliding regulations.

BOD$_5$ and Total Suspended Solids

Pursuant to 40 C.F.R. 133.102, the Federal technology-based effluent limit for BOD$_5$ and TSS at a wastewater treatment plant with secondary treatment, is 30 mg/L (average monthly limit) and 45 mg/l (average weekly limit). The 85% minimum removal rates are also required for both parameters. These concentration effluent limits are retained from the previous permit.

Appendix C: Reasonable Potential Calculations

The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of the State of Idaho federally approved WQS. EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential.

To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This section discusses how the maximum projected receiving water concentration is determined.

A. Mass Balance

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

$$C_dQ_d = C_eQ_e + C_uQ_u \qquad \text{(Equation C-1)}$$

where,

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

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

$$C_d = \frac{C_eQ_e + C_uQ_u}{Q_e + Q_u} \qquad \text{(Equation C-2)}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

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

Where MZ is the fraction of the receiving water flow available for dilution. In this case, the mixing zone is based on complete mixing of the effluent and the receiving water, and MZ is equal to unity (1). Therefore, in this case, Equation C-3 is equal to Equation C-2.

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

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

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

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

For each season of the year, there are three values for the dilution factor: one based on the 1Q10 flow rate (481 cfs) in the receiving stream and used to determine reasonable potential and wasteload allocations for acute aquatic life criteria, one based on the 7Q10 flow rate (672 cfs) to determine reasonable potential and wasteload allocations chronic aquatic life criteria (except for ammonia) and conventional pollutants, and one based on the 30B3 flow rate (889 cfs) to determine reasonable potential and wasteload allocations for the chronic ammonia criterion. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.613mgd (0.95cfs). When applied to Equation C-5, and using 25% of flow per Idaho regulations, this results in a total of four different dilution factors under consideration. The dilution factors are listed in Table C-1, below.

Table C-1: Dilution Factors

Acute Dilution Factor	Chronic Dilution Factor	Chronic Ammonia Criterion Dilution Factor	Acute Ammonia Criterion Dilution Factor
128	178	235	128

Calculations:

Note – Pursuant to IDAPA 58.01.02.060(e)(iv), Mixing Zone Policy, the multiplication of 0.25 is included in the calculations because the mixing zone is not to include more than 25% of the volume of the stream flow.

For Acute Dilution Factor and Acute Ammonia Criterion Dilution Factor

= (0.95 + (481x0.25))/0.95 = 128;

Chronic Ammonia Dilution Factor = (0.95 + (889x0.25))/0.95 = 235;

Chronic Dilution Factor = (0.95 + (672x0.25))/0.95 = 178

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

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

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as shown in Equation C-7.

$$C_d = \left[\frac{CF \times C_e - C_u}{D}\right] + C_u \qquad \text{(Equation C-7)}$$

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

Equations C-6 and C-7 are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

B. Maximum Projected Effluent Concentration

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

For chlorine, EPA has used the technology-based limit as the maximum projected effluent concentration. The technology-based effluent limit is used in this manner because water quality-based effluent limits are required only when a discharge of the pollutant at the technology-based limit has the reasonable potential to cause or contribute to water quality standards violations. EPA also considered the reasonable potential for the facility to exceed the State of Idaho WQS, and it has been determined that there is no potential because the facility does not use chlorine for disinfection.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6. For ammonia, there were more than 10 data points, and the calculated CV is 2.38 based on the division of the standard deviation of the data, divided by the mean value.

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for ammonia as an example.

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

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

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

For a set of 36 ammonia samples:

$p_n = (1\text{-}0.99)^{1/37}$
$p_n = 0.88$

This means that we can say, with 99% confidence, that the maximum reported effluent ammonia concentration is greater than the 88th percentile.

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

$RPM = C_{99}/C_p$ (Equation C-9)

Where,
$C = \exp(z\delta - 0.5\delta^2)$ (Equation C-10)

Where,
$\delta^2 = \ln(CV^2 + 1)$ (Equation C-11)
$\delta = \sqrt{\sigma^2}$
CV = coefficient of variation = (standard deviation) ÷ (mean)
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of ammonia:

CV = coefficient of variation = 2.38
$\delta^2 = \ln(CV^2 + 1) = 1.89678$
$\delta = \sqrt{\sigma^2} = 1.37723$
z = 2.326 for the 99th percentile

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

$C_e = (RPM)(MRC)$ (Equation C-12)

where MRC = Maximum Reported Concentration

In the case of ammonia,

$C_e = (4.89)(22{,}700\ \mu g/L) = 111{,}003\ \mu g/L = 111\ mg/l$

C. Maximum Projected Receiving Water Concentration

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant. The maximum projected receiving water concentration is calculated from Equation C-13:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{(Equation C-13)}$$

Or, if the criterion is expressed as dissolved metal, the maximum projected receiving water concentration is calculated from Equation C-14:

$$C_d = \left[\frac{CF \times C_e - C_u}{D} \right] + C_u \qquad \text{(Equation C-14)}$$

Where C_e is expressed total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is the conversion factor.

Using a State of Idaho spreadsheet for calculating the ammonia criteria (http://www.deq.state.id.us/water/data_reports/surface_water/monitoring/ammonia_criteria.xls), and data obtained from facility, the Acute Ammonia Criteria is 4.6 mg/l, and the Chronic Ammonia Criteria is 1.35 mg/l. The ammonia data used for this calculation was submitted from the facility along with its permit application, and represents the worst case scenario (highest ambient pH of 8.1; highest ambient temperature of 21.3C; and the highest ambient ammonia concentration of 0.36 mg/l).

The analysis is shown in Table C-2. EPA computed reasonable potential using a programmed spreadsheet. The results show that data from the facility show that the effluent of ammonia has no potential to exceed applicable WQS. Therefore, based on these circumstances, EPA is not requesting an effluent limit for ammonia.

Table C-2: Reasonable Potential Calculations

		Water Quality Stds.		Max concentration		Calculations									
	Ambient Concentration	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQUIRED?**	Effluent percentile value		Computed Max effluent conc. measured (metals as total recoverable)	Coeff of Variation		# of samples	Reasonable Potential Multiplier	Acute Dilution Factor	Chronic Dilution Factor
Parameter	*ug/l*	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
Ammonia, as N	360	4600	1350	1223	830	**NO**	0.99	0.88	22700	2.38	1.38	36	4.89	128	235

Footnote: 1. Based on State of Idaho Water Quality Standards, incorporating EPA's 99th percentile statistical calculation. As modified from State of Washington's spreadsheet for calculating reasonable potential.

2. Ambient Concentration based on the highest facility supplied upstream monitoring result (Feb. 7, 2007).

3. Ammonia WQS calculated using highest upstream temperature reading of 22 C (August 2008), and Using the highest upstream ambient pH reading of 8.1 (October 2004).

APPENDIX D

ENDANGERED SPECIES ACT

As discussed in Section VII.C. of this fact sheet, Section 7 of the Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if there are potential affects a federal action may have on threatened and endangered species.

I. Threatened and Endangered Species

According to the USFWS species list, the following federally-listed species are in the vicinity of the discharge (for Idaho County and Lewis County). The species denoted by a * are under the jurisdiction of NMFS:

Endangered Species:
Sockeye salmon (*Oncorhynchus nerka)*

Threatened Species:
Bull Trout (*Salvelinus confluentus*)
MacFarlane=s Four-O=clock (*Mirabilis macfarlanei)*
Chinook Salmon (*Oncorhynchus tshawytscha*)*
Steelhead (*Oncorhynchus mykiss*)*
Spalding’s catchfly *(Silene spaldingii)*
Canada Lynx (*Lynx canadensis*)

Proposed Threatened Species:
None

II. Potential Effects for Species

A. Sockeye Salmon (*Oncorhynchus nerka)* - Endangered

The sockeye salmon is the third most abundant of the seven species of Pacific salmon, after pink salmon (*O. gorbuscha*) and chum salmon. Sockeye contributed about 17 percent by weight and 14 percent in numbers to the total salmon catch in the North Pacific Ocean and adjacent waters during the period 1952 to 1976 (Burgner 2003).

Sockeye salmon exhibit a greater variety of life history patterns than other member of the genus

Oncorhynchus and characteristically make more use of lake rearing habitat in juvenile stages. Although sockeye are primarily anadromous, there are distinct populations called kokanee that mature, spawn, and die in fresh water without a period of sea life. Typically, but not universally, juvenile anadromous sockeye utilize lake rearing areas for one to three years after emergence from the gravel; however, some populations utilize stream areas for rearing and may migrate to sea soon after emergence. Anadromous sockeye may spend from one to four years in the ocean before returning to freshwater to spawn and die in late summer and autumn. The sockeye also shows a wide variety of racial adaptations to specialized spawning and rearing habitat combinations (Burgner 2003).

The primary spawning grounds of sockeye salmon in North America extend from tributaries of the Columbia River to the Kuskokwim River in western Alaska, and, on the Asian side, the spawning areas are found mainly on the Kamchatka Peninsula of Russia. During their feeding and maturation phase in the ocean, sockeye range throughout the North Pacific Ocean, Bering Sea, and eastern Sea of Okhotsk north of 40E N. There is considerable intermingling of Asian and North American populations from Bering Sea and Gulf of Alaska streams. Maturing sockeye return to their respective spawning rivers at different times varying from late spring to midsummer. Spawning time range from late July through January, but are primarily from midsummer until late autumn (Burgner 2003).

Analysis of Potential Impacts to Sockeye Salmon

In consideration of all factors pertaining to the Sockeye Salmon and the discharge from the WWTP, it is predicted that there will be no impact to the Sockeye Salmon. The discharge does not contribute to the factors responsible for the bull trout’s decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Sockeye Salmon. The Sockeye Salmon is a highly mobile species, discharge is not from a major facility, and the effluent is treated to Federal Secondary Treatment Standards, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the Sockeye Salmon from the discharge.

B. Bull Trout (*Salvelinus confluentus*) - Threatened

The bull trout is a member of the char family (*Salvelinus*) and is represented by different life history forms, including river-resident populations, lacustrine populations, and sea-run populations. The latter appear to be relatively rare (Behnke 2002).

The stream-resident form is subdivided into two basic types: one lives its entire life in small headwater streams, often isolated above waterfalls; the other typically spawns in smaller tributary streams but spends most of its time foraging in larger rivers. This second form, often called “fluvial,” occurs only in relatively larger river basins that contain a network of headwater spawning tributaries connected to larger riverine habitat, allowing bull trout to undertake movements of more than 100 miles (Behnke 2002).

The northernmost distribution of bull trout occurs in the headwaters of the Yukon and Mackenzie River basins of Alaska and Canada. In Pacific Coast drainages, they occur in rivers of British Columbia southward to around Puget Sound. Bull trout are not native to Vancouver Island or other islands off the Pacific Coast of and Canada and southern Alaska. Native distribution includes the upper parts of the North and South Saskatchewan River drainages of Alberta, Canada (Behnke 2002).

To the south, a few bull trout populations persist in cold headwater tributary streams in the Upper Klamath Lake basin of Oregon. The southernmost population of bull trout once occurred in the McCloud River of California. However, those bull trout declined rapidly in the 1940s after construction of Shasta Dam (Behnke 2002).

Columbia Basin Bull Trout

Status

The CR bull trout distinct population segment (DPS) was listed as threatened on June 10, 1998 (62 FR 32268). The following information on bull trout was taken from 63 FR 31647-31674 and USFWS 2002a).

Geographic Range and Spatial Distribution

The Columbia River population segment is from the northwestern United States and British Columbia, Canada. This population segment is comprised of 386 bull trout populations in Idaho, Montana, Oregon, and Washington with additional populations in British Columbia. The Columbia River population segment includes the entire Columbia River basin and all its tributaries, excluding the isolated bull trout populations found in the Jarbridge River in Nevada. Bull trout populations within the Columbia River population segment have declined from historic levels and are generally considered to be isolated and remnant.

Critical Habitat

Critical habitat has been designated for Columbia River Basin bull trout on September 26, 2005 (70 FR 56213). The critical habitat proposal for bull trout in the Columbia River basin calls for a total of 3,828 miles of streams in Oregon, Washington, Idaho, and Montana to be designated as critical bull trout habitat, along with 143,218 acres of lakes and reservoirs in those four states.

Life History

Bull trout are seldom found in waters where temperatures are warmer than 15EC to 17.8EC. Besides very cold water, bull trout require stable stream channels, clean spawning gravel, complex and diverse cover, and unblocked migration routes (USFWS 2002a). Because bull trout life history patterns include migratory and resident forms, both adults and juveniles are present in the streams throughout the year. Bull trout adults may begin to migrate from feeding to spawning grounds in the spring and migrate slowly throughout the summer (Pratt 1992).

Bull trout eggs incubate from 100 to 145 days, usually in winter, after which the alevins require 65 to 90 days to absorb their yolk sacs (Pratt 1992). They remain within the interstices of the streambed as fry for up to three weeks before filling their air bladder, reaching lengths of 25-28 mm, and emerging from the streambed in late April (McPhail and Murry 1979, Pratt 1992).

Population Trends and Risks

The Columbia River population segment includes bull trout residing in portions of Oregon, Washington, Idaho and Montana. Bull trout are estimated to have once occupied about 60 percent of the Columbia River basin; they presently are known or predicted to occur in less than half of watersheds in the historical range (Quigley and Arbelbide 1997), which amounts to approximately 27 percent of the basin (67 FR 71239). Another evaluation of the distribution and status of bull trout within the Columbia River and Klamath River basins indicates that bull trout are present in about 36 percent of the watersheds in their potential range and are estimated to have strong populations in only 6-12 percent of the potential range (Rieman et al. 1997). Among the many factors that contributed to the decline of the bull trout in the Columbia River and Klamath River basins, the following three factors seem to be particularly significant. First, fragmentation and isolation of local populations due to the proliferation of dams and water diversions which have eliminated habitat, altered water flow and temperature regimes and impeded migratory movements (Rieman and McIntyre 1993, Dunham and Rieman 1999). Second, degradation of spawning and rearing habitat in upper watershed areas, particularly alterations in sedimentation rates and water termperature resulting from past forest and rangeland management practices and intensive development of roads (Fraley and Shepard 1989). Thirdly, the introduction and spread of nonnative species particularly brook trout, and lake trout, which compete with bull trout for limited resources (Ratliff and Howell 1992, Leary et al. 1993).

Analysis of Potential Impacts to Bull Trout

In consideration of all factors pertaining to the Bull Trout and the discharge from the WWTP, it is predicted that there will be no impact to the Bull Trout. The discharge does not contribute to the factors responsible for the bull trout's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Bull Trout. The bull trout is a highly mobile species, discharge is not from a major facility, and the effluent is treated to Federal Secondary Treatment Standards, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the bull trout from the discharge.

C. MacFarlane=s Four-O=clock (*Mirabilis macfarlanei)* - Threatened

On October 26, 1979, the MacFarlane's Four-o'clock was designated as endangered in its entire range (USFWS 1979). Since that time, additional populations were discovered, and populations on Federal lands were being actively managed and monitored. As a result of these ongoing recovery efforts, the MacFarlane’s Four-o'clock was downlisted to threatened status in March 1996 (USFWS 1996).

Range of Species

Within the area covered by this listing, this species is endemic to portions of the Snake, Salmon and Imnaha River canyons in Wallowa County in northeast Oregon, and adjacent Idaho county in Idaho (Moseley 1993).

Critical Habitat

Critical habitat has not been designated for this species.

Life History

MacFarlane's four-o'clock is a member of the four-o'clock family (Nyctaginaceae). It is a perennial plant with a stout, deep-seated taproot. Flowering is from early May to early June, with mid-May usually being the peak flowering period. Known MacFarlane’s four-o’clock locations include Cottonwood Landing, Island Gulch, Kurry Creek, Kurry Creek-West Creek divide, Mine Gulch, Tyron Bar, and West Creek. *Mirabilis macfarlanei* is found on talus slopes in canyon land corridors where the climate is regionally warm and dry, with precipitation occurring mostly in a winter-to-spring period. If *M. macfarlanei* originated in northern areas during a warmer period and its path of retreat with cooling climate was cut off by less favorable conditions, the warmer climate would explain the restricted distribution of the species.

Population Trends and Risks

Twelve years of recovery efforts for the MacFarlane's Four-o'clock, have removed this species from the brink of extinction. As a result, on March 15, 1996, USFWS reclassified the plant from endangered to the less critical category of threatened in 1996 (USFWS 1996). Improved livestock grazing management, research, the discovery of additional plant locations on public lands, and the stable condition of existing populations led the USFWS to conclude that the status of MacFarlane's Four-o'clock has substantially improved. MacFarlane’s Four-o’clock is currently found in eleven populations in Idaho and Oregon. The amount of occupied habitat located in Idaho and Oregon since the species' listing represents a three-fold increase due to new discoveries.

Habitat destruction due to vehicular travel along with surface disturbance associated with mining could contribute to degradation of MacFarlane’s four-o'clock habitat. Livestock damage may also minimally impact the species, and weedy invasion in areas of previous grazing activity may be a threat (Mancuso and Moseley 1991). Increased collecting pressure is a foreseeable problem if the specie's location becomes known. Mule deer prefer forbs and some utilization of *Mirabilis macfarlanei* has also been observed.

Insect depredation has been shown to be detrimental to MacFarlane's four-o'clock. Past indiscriminate herbicide spraying has also had adverse effects on the small number of *Mirabilis macfarlanei* plants. In addition, using insecticides for insect control is detrimental to many of the known pollinators of this species, including several genera of bees.

Analysis of Potential Impacts to MacFarlane's Four-O'clock

In consideration of all factors pertaining to the plant MacFarlane's Four O'clock and the discharge from the WWTP, it is predicted that there will be no impact to the MacFarlane's Four O'clock. The discharge does not contribute to the factors responsible for this plant's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to this plant because the MacFarlane's Four O'clock is found on talus slopes in canyon land corridors where the climate is regionally warm and dry. The discharge is into the Clearwater River, not where this plant is found. Therefore, no measurable impacts are predicted. **No effect** is predicted on the MacFarlane's Four O'clock from the discharge.

D. Chinook Salmon (*Oncorhynchus tshawytscha)* - Threatened

(The following summary is taken from 63 FR 11481, 3/9/98).

Chinook salmon are easily distinguished from other *Oncorhynchus* species by their large size. Adults weighing over 120 pounds have been caught in North American waters. Chinook salmon are very similar to coho salmon in appearance while at sea (blue-green back with silver flanks), except for their large size, small black spots on both lobes of the tail, and black pigment along the base of the teeth. Chinook salmon are anadromous and semelparous. This means that as adults, they migrate from a marine environment into the freshwater streams and rivers of their birth (anadromous) where they spawn and die (semelparous). Adult female Chinook will prepare a spawning bed, called a redd, in a stream area with suitable gravel composition, water depth and velocity. Redds will vary widely in size and in location within the stream or river. The adult female Chinook may deposit eggs in four to five "nesting pockets" within a single redd. After laying eggs in a redd, adult Chinook will guard the redd from four to 25 days before dying. Chinook salmon eggs will hatch, depending upon water temperatures, between 90 to 150 days after deposition. Stream flow, gravel quality, and silt load all significantly influence the survival of developing Chinook salmon eggs. Juvenile Chinook may spend from three months to two years in freshwater after emergence and before migrating to estuarine areas as smolts, and then into the ocean to feed and mature.

Among Chinook salmon two distinct races have evolved. One race, described as a “stream-type” Chinook, is found most commonly in headwater streams. Stream-type Chinook salmon have a longer freshwater residency and perform extensive offshore migrations before returning to their natal streams in the spring or summer months. The second race is called the “ocean-type” Chinook, which is commonly found in coastal steams in North America. Ocean-type Chinook typically migrate to sea within the first three months after emergence, but they may spend up to a year in freshwater prior to emigration. They also spend their ocean life in coastal waters. Ocean-type Chinook salmon return to their natal streams or rivers as spring, winter, fall, summer, and late-fall runs, but summer and fall runs predominate. The difference between these life history types is also physical, with both genetic and morphological foundations.

Juvenile stream- and ocean-type Chinook salmon have adapted to different ecological niches. Ocean-type Chinook salmon tend to utilize estuaries and coastal areas more extensively for juvenile rearing. The brackish water areas in estuaries also moderate physiological stress during parr-smolt transition. The development of the ocean-type life history strategy may have been a response to the limited carrying capacity of smaller stream systems and glacially scoured, unproductive, watersheds, or a means of avoiding the impact of seasonal floods in the lower portion of many watersheds.

Stream-type juveniles are much more dependent on freshwater stream ecosystems because of their extended residence in these areas. A stream-type life history may be adapted to those watersheds, or parts of watersheds, that are more consistently productive and less susceptible to dramatic changes in water flow or which have environmental conditions that would severely limit the success of sub-yearling smolts. At the time of saltwater entry, stream-type (yearling) smolts are much larger, averaging 73-134 mm depending on the river system, than their ocean-type (sub-yearling) counterparts and are, therefore, able to move offshore relatively quickly.

Coast wide, Chinook salmon remain at sea for one to six years (more common, two to four years), with the exception of a small proportion of yearling males, called jack salmon, which mature in freshwater or return after two or three months in salt water. Ocean- and steam-type Chinook salmon are recovered differentially in coastal and mid-ocean fisheries, indicating divergent migratory routes. Ocean-type Chinook salmon tend to migrate along the coast, while stream-type Chinook salmon are found far from the coast in the central North Pacific. Differences in the ocean distribution of specific stocks may be indicative of resource partitioning and may be important to the success of the species as a whole.

There is a significant genetic influence to the freshwater component of the returning adult migratory process. A number of studies show that Chinook salmon return to their natal streams with a high degree of fidelity. Salmon may have evolved this trait as a method of ensuring an adequate incubation and rearing habitat. It also provides a mechanism for reproductive isolation and local adaptation. Conversely, returning to a stream other than that of one’s origin is important in colonizing new areas and responding to unfavorable or perturbed conditions at the natal stream.

Chinook salmon stocks exhibit considerable variability in size and age of maturation, and at least some portion of this variation is genetically determined. The relationship between size and length of migration may also reflect the earlier timing of river entry and the cessation of feeding for Chinook salmon stocks that migrate to the upper reaches of river systems. Body size, which is correlated with age, may be an important factor in migration and redd construction success. Under high density conditions on the spawning ground, natural selection may produce stocks with exceptionally large-sized returning adults.

Early researchers recorded the existence of different temporal “runs” or modes in the migration of Chinook salmon from the ocean to freshwater. Freshwater entry and spawning timing are believed to be related to local temperature and water flow regimes. Seasonal “runs” (i.e., spring, summer, fall, or winter) have been identified on the basis of when adult Chinook salmon enter freshwater to begin their spawning migration. However, distinct runs also differ in the degree of maturation at the time of river entry, the thermal regime and flow characteristics of their spawning site, and their actual time of spawning. Egg deposition must occur at a time to ensure that fry emerge during the following spring when the river or estuary productivity is sufficient for juvenile survival and growth.

Pathogen resistance is another locally adapted trait. Chinook salmon from the Columbia River drainage were less susceptible to *Ceratomyxa shasta*, an endemic pathogen, than stocks from coastal rivers where the disease is not known to occur. Alaskan and Columbia River stocks of Chinook salmon exhibit different levels of susceptibility to the infectious hematopoietic necrosis virus (IHNV).

The preferred temperature range for Chinook salmon has been variously described as 12.2-13.9 degrees C (Brett 1952), 10-15.6 degrees C (Burrows 1963), or 13-18 degrees C (Theurer et al. 1985). Temperatures for optimal egg incubation are 5.0-14.4 degrees C (Bell 1986). The upper lethal temperature limit is 25.1 degrees C (Brett 1952) but may be lower depending on other water quality factors (Ebel et al. 1971). Variability in temperature tolerance between populations is likely due to selection for local conditions; however, there is little information on the genetic basis of this trait.

Dissolved oxygen concentrations of 5.0 mg/L or greater are needed for successful egg development in redds for water temperatures between 4-14 degrees C (Reiser and Bjornn 1979, as cited in NMFS 1996). Freshwater juveniles avoid water with dissolved oxygen concentrations below 4.5 mg/L at 20 degrees C (Whitmore et al. 1960). Migrating adults will pass through water with dissolved oxygen levels as low as 3.5-4.0 mg/L (Fujioka 1970; Alabaster 1988, 1989).

Snake River Fall Chinook Salmon

Status

This ESU was listed as threatened on April 22, 1992. The 11/2/94 Emergency Rule (59 FR 54840), reclassifying Snake River Chinook from threatened to endangered, expired on May 26, 1995.

Geographic Range and Spatial Distribution

The Snake River Basin includes an area of approximately 280,000 km^2 and incorporates a range of vegetative life zones, climatic regions, and geological formations. The Snake River ESU includes the mainstem of the river and all tributaries, from their confluence with the Columbia River to the Hells Canyon Dam complex. Because genetic analyses indicate that fall-run chinook salmon in the Snake River are distinct from the spring-summer-run in the Snake River Basin (Waples and Johnson 1991a, as cited in Meyers et al. 1998), Snake River fall-run Chinook salmon are considered separately from the other two forms. They are also considered separately from those assigned to the Upper Columbia River summer- and fall-run ESU because of considerable differences in habitat characteristics and adult ocean distribution and less definitive, but still significant, genetic differences. There is, however, some concern that recent introgression from Columbia River hatchery strays is causing the Snake River population to lose the qualities that made it distinct for ESA purposes.

Critical Habitat

The critical habitat for the Snake River fall Chinook salmon was listed on December 28, 1993 (58 FR 68543) and modified on March 9, 1998 (63 FR 11515) to include the Deschutes River. A 1995 status review found that the Deschutes River fall-run Chinook salmon population should be considered part of the Snake River fall-run ESU. Populations from Deschutes River and the Marion Drain (tributary of the Yakima River) show a greater genetic affinity to Snake River ESU fall Chinook than to the Upper Columbia River summer-fall-run Chinook (March 9, 1998, 63 FR 11490). The designated critical habitat (63 FR 11515, March 9, 1998) for the Snake River fall Chinook salmon includes all river reaches accessible to Chinook salmon in the Columbia River from The Dalles Dam upstream to the confluence with the Snake River in Washington (inclusive). Critical habitat in the Snake River includes its tributaries in Idaho, Oregon, and Washington (exclusive of the upper Grande Ronde River and the Wallowa River in Oregon, the Clearwater River above its confluence with Lolo Creek in Idaho, and the Salmon River upstream of its confluence with French Creek in Idaho). Also included are river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to The Dalles Dam. Excluded are areas above specific dams identified in Table 17 (see March 9, 1998, 63 FR 11519) or above longstanding, naturally impassable barriers (e.g., natural waterfalls in existence for at least several hundred years).

Historical Information

Snake River fall-run Chinook salmon remained stable at high levels of abundance through the first part of the 20th century, but then declined substantially. Although the historical abundance of fall-run Chinook salmon in the Snake River is difficult to estimate, adult returns appear to have declined by three orders of magnitude since the 1940s and perhaps by another order of magnitude from pristine levels. Irving and Bjornn (1981) estimated that the mean number of fall-run Chinook salmon returning to the Snake River declined from 72,000 during the period 1938 to 1949, to 29,000 during the 1950s. Further declines occurred upon completion of the Hells Canyon Dam complex, which blocked access to primary production areas in the late 1950s. Estimated returns of naturally produced adults from 1985 through 1993 range from 114 to 742 fish (USEPA 1998).

Life History

Fall-run Chinook salmon in this ESU are ocean-type. Ocean-type Chinook typically migrate to sea within 3 months of emergence but may spend up to a year in freshwater prior to emigration. Adults return to the Snake River at ages 2 through 5, with age 4 most common at spawning (Chapman et al. 1991, as cited in Meyers et al. 1998). Spawning, which takes place in late fall, occurs in the mainstem and in the lower parts of major tributaries (NWPPC 1989, Bugert et al. 1990). Juvenile fall-run Chinook salmon move seaward slowly as subyearlings, typically within several weeks of emergence (Chapman et al. 1991, as cited in Meyers et al. 1998). Based on modeling by the Chinook Technical Committee, the Pacific Salmon Commission estimates that a significant proportion of the Snake River fall-run Chinook (about 36 percent) are taken in Alaska and Canada, indicating a far-ranging ocean distribution. In recent years, only 19 percent were caught off Washington, Oregon, and California, with the balance (45 percent) taken in the Columbia River (Simmons 2000).

Habitat and Hydrology

With hydrosystem development, the most productive areas of the Snake River Basin are now inaccessible or inundated. The upper reaches of the mainstem Snake River were the primary areas used by fall-run Chinook salmon, with only limited spawning activity reported downstream from river kilometer (Rkm) 439. The construction of Brownlee Dam (1958; Rkm 459), Oxbow Dam (1961; Rkm 439), and Hells Canyon Dam (1967; Rkm 397) eliminated the primary production areas of Snake River fall-run Chinook salmon. There are now 12 dams on the mainstem Snake River, and they have substantially reduced the distribution and abundance of fall-run Chinook salmon (Irving and Bjornn 1981).

Hatchery Influence

The Snake River has contained hatchery-reared fall-run Chinook salmon since 1981 (Busack 1991). The hatchery contribution to Snake River escapement has been estimated at greater than 47 percent (Meyers et al. 1998). Artificial propagation is recent, so cumulative genetic changes associated with it may be limited. Wild fish are incorporated into the brood stock each year, which should reduce divergence from the wild population. Release of sub-yearling fish may also help minimize the differences in mortality patterns between hatchery and wild populations that can lead to genetic change (Waples 1999).

Population Trends and Risks

Almost all historical Snake River fall-run Chinook salmon spawning habitat in the Snake River Basin was blocked by the Hells Canyon Dam complex; other habitat blockages have also occurred in Columbia River tributaries. The ESU's range has also been affected by agricultural water withdrawals, grazing, and vegetation management. The continued straying by nonnative hatchery fish into natural production areas is an additional source of risk. Assessing extinction risk to the newly configured ESU is difficult because of the geographic discontinuity and the disparity in the status of the two remaining populations. The relatively recent extirpation of fall-run Chinook in the John Day, Umatilla, and Walla Walla Rivers is also a factor in assessing the risk to the overall ESU. Long-term trends in abundance for specific tributary systems are mixed. For the Snake River fall-run Chinook salmon ESU, NOAA Fisheries estimates that the median population growth rate (lambda) over a base period from 1980 through 1998 ranges from 0.94 to 0.86, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared with that of fish of wild origin (McClure et al. 2000). The Snake River component of the fall Chinook run has been increasing during the past few years as a result of hatchery and supplementation efforts in the Snake and Clearwater River Basins. In 2002, more than 15,200 fall chinook were counted past the two lower dams on the Snake River, with about 12,400 counted above Lower Granite Dam. These adult returns are about triple the 10-year average at these Snake River projects (FPC 2003).

Analysis of Potential Impacts to the Chinook Salmon

In consideration of all factors pertaining to the Chinook Salmon and the discharge from the WWTP, it is predicted that there will be no impact to the Chinook Salmon. The discharge does not contribute to the factors responsible for the Chinook Salmon's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Chinook Salmon. The Chinook Salmon is a highly mobile species, discharge is not from a major facility, and the effluent is treated to Federal Secondary Treatment Standards, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the Chinook Salmon from the discharge.

E. Steelhead (*Oncorhynchus mykiss)* - Threatened

The steelhead is the anadromous form of the rainbow trout (*O. mykiss*), which occurs in two subspecies, *O. mykiss irideus* and *O. mykiss gaidneri*. Whereas stream-resident rainbow trout may complete their life cycle in a limited area of a small stream and attain a length of only 8 inches or so, steelhead may spend half their lives at sea, roaming for thousands of miles in the North Pacific Ocean. Steelhead return to spawn at sizes ranging from about 24 inches and 5 pounds to about 36 to 40 inches or more and 20 pounds or more (Behnke 2002).

Biologically, steelhead can be divided into two reproductive ecotypes, based on their state of sexual maturity at the time of river entry. These two ecotypes are termed "stream-maturing" and "ocean-maturing". Stream-maturing steelhead enter fresh water in a sexually immature condition and require from several months to a year to mature and spawn. These fish are often referred to as "summer run" steelhead. Ocean-maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These fish are commonly referred to as "winter-run" steelhead. In the Columbia River basin, essentially all steelhead that return to streams east of the Cascade Mountains are stream-maturing. Ocean-maturing fish are the predominate ecotype in coastal streams and lower Columbia River tributaries (ACOE 2000b).

All but one of the *O. m. gairdneri* steelhead populations migrating east of the Cascade Range are characterized as summer-run steelhead (entering the Columbia River from May into the early fall in October); the one exception is a winter-run steelhead spawning in Fifteenmile Creek, which drains the eastern side of the Cascades in Oregon. The genetic traits of Fifteenmile Creek steelhead make it intermediate between the subspecies *irideus* and *gairdneri*. Steelhead of the subspecies *irideus* are mainly winter-run fish, but *irideus* also has summer runs. Considering the entire range of *irideus* from California to Alaska, steelhead can be found entering one river or another in every month of the year (Behnke 2002).
Native steelhead in California generally spawn earlier than those to the north with spawning beginning in December. Washington populations begin spawning in February or March. Native steelhead spawning in Oregon and Idaho is not well documented. In the Clackamas River in Oregon, winter-run steelhead spawning begins in April and continues into June. In the Washougal River, Washington, summer-run steelhead spawn from March into June whereas summer-run fish in the Kalama River, Washington, spawn from January through April. Among inland steelhead, Columbia River populations from tributaries upstream of the Yakima River spawn later than most downstream populations.

Depending on water temperature, fertilized steelhead eggs may incubate in redds for 1.5 to 4 months before hatching as “alevins”. Following yolk sac absorption, young juveniles or “fry” emerge from the gravel and begin active feeding. Juveniles rear in fresh water for 1 to 4 years, then migrate to the ocean as smolts. Downstream migration of wild steelhead smolts in the lower Columbia River begins in April, peaks in mid-May, and is essentially complete by the end of June (ACOE 2000b). Previous studies of the timing and duration of steelhead downstream migration indicate that they typically move quickly through the lower Columbia River estuary with an average daily movement of about 21 kilometers (ACOE 2000b).

Juvenile steelhead generally spend two years in freshwater before smolting and migrating to the ocean at lengths of about 6 to 8 inches. After about 15 to 30 months of ocean life, most steelhead return to their natal rivers to spawn. Unlike Pacific salmon, steelhead do not all die soon after spawning, but the rate of survival to repeat spawning is generally low - about 10 percent (Behnke 2002).

Snake River Steelhead

Status

The SR steelhead ESU was listed as threatened on August 18, 1997 (62FR43937).

Geographic Range and Spatial Distribution

This inland steelhead ESU occupies the Snake River Basin of southeast Washington, northeast Oregon and Idaho. The Snake River flows through terrain that is warmer and drier on an annual basis than the upper Columbia Basin or other drainages to the north. Geologically, the land forms are older and much more eroded than most other steelhead habitat. Collectively, the environmental factors of the Snake River Basin result in a river that is warmer and more turbid, with higher pH and alkalinity than is found elsewhere in the range of inland steelhead. In many Snake River tributaries, spawning occurs at a higher elevation (up to 2,000 m) than for steelhead in any other geographic region.

Critical Habitat

The critical habitat for SR steelhead was initially designated on February 16, 2000 (65FR7764), but was withdrawn in April 2002 and is currently under development.. The initial designated habitat consisted of all river reaches accessible to listed steelhead in the Snake River and its tributaries in Idaho, Oregon, and Washington. Also included were river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to the confluence with the Snake River. Excluded were areas above the Hells Canyon and Dworshak Dams and areas above longstanding, naturally impassable barriers (i.e., Napias

Creek Falls and other natural waterfalls in existence for at least several hundred years). The revised habitat designation included numerous watersheds throughout the Clearwater and South Fork Clearwater basins as well as other watersheds throughout Washington, Idaho and Oregon. Habitat was also excluded for four watersheds including Agency Creek, Flat Creek, Lower Palouse River and Upper Orofino Creek.

Historical Information

The longest consistent indicator of steelhead abundance in the Snake River basin is derived from counts of natural-origin steelhead at the uppermost dam on the lower Snake River. According to these estimates, the abundance of summer steelhead has declined from a 4-year average of 58,300 in 1964 to a 4-year average of 8,300 ending in 1998 (NMFS 2000). In general, steelhead abundance declined sharply in the early 1970's, rebounded moderately from the mid 1970's through the 1980's, and declined again during the 1990's.

Life History

Fish in this ESU are summer steelhead. They enter freshwater from June to October and spawn during the following March to May. Two groups are identified, based on migration timing, ocean-age, and adult size. A-run steelhead, thought to be predominately age-1-ocean, enter freshwater during June through August. B-run steelhead, thought to be age-2-ocean, enter freshwater during August through October. B-run steelhead are typically 75 to 100 mm longer at the same age. Both groups usually smolt as 2- or 3-year-olds (Whitt 1954, BPA 1992, Hassemer 1992). All steelhead are iteroparous, capable of spawning more than once before death.

Habitat and Hydrology

Hydrosystem projects create substantial habitat blockages in this ESU; the major ones are the Hells Canyon Dam complex (mainstem Snake River) and Dworshak Dam (North Fork Clearwater River). Minor blockages are common throughout the region. Steelhead spawning areas have been degraded by overgrazing, as well as by historical gold dredging and sedimentation due to poor land management. Habitat in the Snake River basin is warmer and drier and often more eroded than elsewhere in the Columbia River basin or in coastal areas.

Hatchery Influence

Hatchery fish are widespread and stray to spawn naturally throughout the region. In the 1990s, on average, 86 percent of adult steelhead passing Lower Granite Dam were of hatchery origin. Hatchery contribution to naturally spawning populations varies, however, across the region. Hatchery fish dominate some stocks, but do not contribute to others.

Population Trends and Risks

For the SR steelhead ESU as a whole, NMFS (2000) estimates that the median population growth rate (lambda) over a base period from 1990 through 1998 ranges from 0.91 to 0.70, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000). The main contributor of steelhead in the Columbia River basin is the Snake River. In 2002, the tributary into the Snake River was about 210,000, 71 percent of the total counted at McNary Dam (286,805). The 2002 Snake River steelhead count was about twice the 10-year average. The numbers of wild steelhead (non-clipped adipose fin) increased to about an average of 55,000 in the Snake River in 2002 (FPC 2003).

Analysis of Potential Impacts to the Steelhead

In consideration of all factors pertaining to the Steelhead and the discharge from the WWTP, it is predicted that there will be no impact to the Steelhead. The discharge does not contribute to the factors responsible for the Steelhead's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to the Steelhead. The Steelhead is a highly mobile species, discharge is not from a major facility, and the effluent is treated to Federal Secondary Treatment Standards, as well as meeting State Water Quality Standards; therefore, no measurable impacts are predicted. **No effect** is predicted on the Steelhead from the discharge.

F. Spalding's catchfly *(Silene spaldingii)* - Threatened

On October 10, 2001, the Spalding's catchfly was designated as threatened in its entire range (USFWS 2001).

Range of Species

When Spalding's catchfly was listed in 2001 there were a total of 58 populations. Since it's listing in 2001, increased survey efforts have resulted in the discovery of an additional 39 populations. Currently there are 22 populations in Idaho, 10.33 in Montana, 17 in Oregon, 49 in Washington, and 0.66 in British Columbia, Canada (USFWS 2007).

Critical Habitat

Critical habitat was proposed for Spalding's catchfly on April 24, 2000 (USFWS 2000d).

Life History

Spalding's catchfly is a long-lived perennial herb in the carnation family. It has four to seven pairs of lance-shaped leaves and small greenish-white flowers. The plant is distinguished by it very sticky foliage and petals that are shallowly lobed. Spalding's catchfly may range from 8 to 24 inches in height, and it flowers from July through early August. Fruit and seed maturation occurs in August, with seed dispersal taking place in late August to early September (Lorain 1991). Rosettes are formed the first year and flowering may occur during or after the second season. The bumblebee, *Bombus fervidus*, appears to be the only significant pollination vector for Spalding's catchfly throughout its range (Lesica 1991). At least in some populations, Spalding's catchfly appears to be subject to pollinator limitations, inbreeding depression, and a large genetic load (Lesica 1991 and 1993).

Population Trends and Risks

Spalding's catchfly is presently known from a total of 99 populations, 22 populations in Idaho, 10.33 in Montana, 17 in Oregon, 49 in Washington, and 0.66 in British Columbia, Canada (USFWS 2007). Spalding's catchfly is a serious conservation concern in all four states where it occurs. Just over half of the known populations of this plant occur on private land, much of which is slated for development, including areas near Redbird Ridge in Idaho, and Wallowa Lake in Oregon.

Throughout its range, much of the Paillasse Prairie grassland habitat of Spalding's catchfly has been converted to crop agriculture or pastureland. Although probably once widespread in the Paillasse region, Spalding's catchfly is now found mainly in small, fragmented sites on the periphery of its former range. Threats to this species may include livestock grazing, herbicide spraying, noxious weed infestation, recreation, road construction and maintenance, conversion of prairie into farmland, fire suppression and urban development (Gamon 1991, Lorain 1991, Heidel 1995, Schassberger 1988 and USFWS 2007).

Analysis of Potential Impacts to the Spalding's Catchfly

In consideration of all factors pertaining to the plant Spalding's Catchfly and the discharge from the WWTP, it is predicted that there will be no impact to the Spalding's Catchfly. The discharge does not contribute to the factors responsible for this plant's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to this plant because the Spalding's Catchfly's habitat is on land, such as grasslands. The discharge is into the Clearwater River, not where this plant is found. Therefore, no measurable impacts are predicted. **No effect** is predicted on the Spalding's Catchfly from the discharge.

G. Canada Lynx *(Lynx canadensis)* - Threatened

Status

The U.S. lower 48 lynx population segment was designated as threatened under the Endangered Species Act on in 1998 (USFWS 1998a). This listing was extended in 1999 (for not more than six months) to include the contiguous United States lynx population segment. This extension allowed time to resolve a dispute over the status of the U.S. lower 48 lynx population (USFWS

1998b). In 2000, USFWS determined threatened status for the contiguous U.S. distinct population segment of the Canada lynx (USFWS 2000a).

Geographical Range and Spatial Distribution

Within the area covered by this listing, the Canada lynx is known to currently occur in Alaska, Arizona, Colorado, Idaho, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New York, North Dakota, Ohio, Oregon, Pennsylvania, Washington and Wyoming.

The Canada lynx is currently found throughout Alaska and Canada (except arctic islands), south through the Rocky Mountains, northern Great Lakes region, and northern New England. The Canada Lynx was considered historically resident in 16 states represented by five ecologically distinct regions: Cascade Range (Washington, Oregon); northern Rocky Mountains (northeastern Washington, southeastern Oregon, Idaho, Montana, western Wyoming, northern Utah); southern Rocky Mountains (southeastern Wyoming, Colorado); northern Great Lakes (Minnesota, Wisconsin, Michigan); and northern New England (Maine, New Hampshire, Vermont, New York, Pennsylvania, Massachusetts). Resident populations currently exist only in Maine, Montana, Washington, and possibly Minnesota. The lynx is considered extant but no longer sustaining self-support populations in Wisconsin, Michigan, Oregon, Idaho, Wyoming, Utah, and Colorado, and assumed to be extirpated from New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts (USFWS 1998a).

Critical Habitat

Critical habitat has been proposed but not designated for Idaho, Maine, Minnesota, Montana and Washington.

Life History

The Canada lynx, a medium-sized cat, breeds in late winter or early spring in North America. Gestation lasts 62-74 days, with litter size averaging 3-4 and adult females producing one litter every 1-2 years. Young lynx stay with their mother until the next mating season or longer. Some females give birth as yearlings, but their pregnancy rate is lower than that of older females (Brainerd 1985). Prey scarcity suppresses breeding and may result in mortality of nearly all young (Brand and Keith 1979). Lynx are mainly nocturnal, being most active from 2 hours after sunset to one hour after sunrise (Banfield 1974). Canada lynx primarily feed on small mammals and birds, particularly snowshoe hare, (*Lepus americanus*). Occasionally lynx may feed on squirrels, small mammals, beaver, deer, moose, muskrat, and birds, some of which are taken as carrion. Lynx have been known to cache food for later use. When prey is scarce, lynx home range increases, and individuals may become nomadic (Ward and Krebs 1985, Saunders 1963, Mech 1980). Male home range (average often about 15-30 sq km, but up to hundreds of sq km in Alaska and Minnesota) is larger than that of females. Long distance dispersal movements of up to several hundred kilometers have been recorded. Population density usually is less than 10 (locally up to 20) per 100 sq km, depending on prey availability. Mean densities range between 2 and 9 per 100 sq km (McCord and Cardoza 1982).

Canada lynx generally occur in boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth, but they may also enter open forest, rocky areas, and tundra to forage for abundant prey. When inactive or birthing, lynx occupy dens typically located in hollow trees, under stumps, or in thick brush. Den sites tend to be in mature or old growth stands with a high density of logs (Koehler 1990).

Population Trends and Risks

In the contiguous U.S., overall numbers and range of the Canada lynx are substantially reduced from historical levels. At present, lynx numbers have not recovered from overexploitation by both regulated and unregulated harvest that occurred in the 1970s and 1980s. Forest management practices that result in the loss of diverse age structure, fragmentation, increased roads, urbanization, agriculture, recreational developments, and unnatural fire frequencies have altered suitable habitat in many areas. As a result, many states may have insufficient habitat quality and/or quantity to sustain lynx or their prey (USFWS 1998a). Human access into habitat has increased dramatically over the last few decades contributing to direct and indirect mortality and displacement from suitable habitat. Although legal take is highly restricted, existing regulatory mechanisms may be inadequate to protect small, remnant populations or to conserve habitat. Competition with bobcats and coyotes may also be a concern in some areas.

Current population size of the Canada lynx in the contiguous U.S. is unknown, but probably numbers less than 2,000 individuals. The Washington lynx population probably numbers fewer than 100 individuals (Stinson 2001). It has been suggested that since lynx occurrence throughout much of the contiguous U.S. is on the southern periphery of the species' range, the presence of lynx is solely a consequence of dispersal from Canada, and that most of the U.S. may never have supported self-sustaining, resident populations over time (USFWS 1998a)

For the Pacific Northwest, U.S. Forest Service et al. (1993) recommended the following actions within known lynx range: (1) minimizing road construction, closing unused roads, and maintaining roads to the minimum standard possible; (2) using prescribed fire to maintain forage for snowshoe hare in juxtaposition with hunting cover for lynx; (3) designating areas to be closed to kill trapping of any furbearer to avoid incidental lynx mortality to maintain population refugia for lynx in key areas; (4) planning for kill-trapping closure on a wider basis if data indicate a declining lynx population as a result of incidental trapping mortality; and (5) developing and implementing a credible survey and monitoring strategy to determine the distribution of lynx throughout its potential range. U.S. Forest Service et al. (1993) listed three primary habitat components for lynx in the Pacific Northwest: (1) foraging habitat (15-35 year-old lodgepole pine) to support snowshoe hare and provide hunting cover; (2) den sites (patches of >200-year-old spruce and fir, generally less than 5 acres; and (3) dispersal/travel cover (variable in vegetation composition and structure).

The major limiting factor is abundance of snowshoe hare, which in turn is limited by availability of winter habitat (in the Pacific Northwest, primarily early successional lodgepole pine with trees at least 6 feet tall) (U.S. Forest Service et al. 1993). In general, the future of the lynx looks more promising than for many other felids. Quinn and Parker (1987) do not believe that habitat alteration has had significant impact on lynx populations, although in the southern portions of its range optimal habitat for snowshoe hares is more patchily distributed (Wolff 1980). Modified logging, leaving interspersing areas of good tree cover, can actually benefit both lynx and their prey. However, suppression of forest fires limits early successional growth favored by hares and may ultimately reduce hare abundance.

Analysis of Potential Impacts to the Canada Lynx

In consideration of all factors pertaining to the Canada Lynx and the discharge from the WWTP, it is predicted that there will be no impact to the Canada Lynx. The discharge does not contribute to the factors responsible for this plant's decline as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects to this animal because the Canada Lynx is a terrestrial species. Therefore, no measurable impacts are predicted. **No effect** is predicted on the Canada Lynx from the discharge.

III. Summary of Potential Imacts Pursuant to ESA

After analyzing potential impacts to each species above, EPA has determined that the requirements contained in the draft permit will have **no effect** on the threatened or endangered species in the vicinity of the discharge. The issuance of an NPDES permit to the City of Kamiah Sewage Treatment Plant will not be expected to result in habitat destruction, nor will it be expected to result in changes in population that could result in increased habitat destruction

APPENDIX E

ESSENTIAL FISH HABITAT

Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH.

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. It is predicted that the Kamiah WWTP would not cause any of the above adverse effects to fish habitat.

Due to the nature of this relatively small wastewater treatment plant (design flow of 0.95cfs) in comparison with the large volume of water at the Clearwater River (7Q10 low flow of 627cfs), in addition to many factors such as the plant operating with Federal Secondary Treatment Standards, and required to be in compliance with State of Idaho Water Quality Standards, the circumstances discussed indicate that there is no measurable impact. Therefore EPA has determined that the re-issuance of this permit has **no effect** on EFH in the vicinity of the discharge.