FACT SHEET

September 21, 2009

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

Washington Beef LLC
P.O. Box 832
201 Elmwood Road
Toppenish, Washington 98948

Permit Number:	WA-005020-2
Public Comment Start Date:	September 30, 2009
Public Comment Expiration Date:	October 30, 2009
EPA Contact:	Kathleen Collins, 206-553-2108, collins.kathleen@epa.gov 1-800-424-4372 ext. 3-0325 (within Region 10)

EPA Proposes NPDES Permit Reissuance.
EPA proposes to reissue an NPDES permit to Washington Beef LLC (hereafter referred to as "Washington Beef"), the owner and operator of a complex slaughterhouse facility located in Toppenish, Washington on the Reservation of the Confederated Tribes and Bands of the Yakama Nation. 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 from the facility to Wanity Slough or Spencer Lateral. The NPDES program is the primary permitting system under the federal Clean Water Act which governs all discharges to waters of the United States.

EPA is re-opening the public comment period for the draft NPDES permit for Washington Beef. The original draft of this permit was released by EPA for public review in April 2004, and again in January 2006. Based upon a new application submitted by Washington Beef on November 14, 2008, EPA has revised the draft permit and fact sheet. Since substantive changes were made to the permit, EPA is re-opening the public comment period.

This Fact Sheet includes:

- Information on public comment, public hearing and appeal procedures;
- A description of the discharge(s);
- A listing of proposed effluent limitations and other conditions;
- A listing of proposed receiving water monitoring requirements;
- Technical material supporting the conditions in the permit.

Public Comment

Persons wishing to comment on or request a public hearing concerning the draft NPDES 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 regional Director for the Office of Water and Watersheds will make a final determination regarding permit reissuance.

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

Documents are Available for Review.

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's regional office in Seattle, Washington between 8:30 a.m. and 4:00 p.m., Monday through Friday.

United States Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900, OWW - 130
Seattle, Washington 98101-3140
(206) 553-0060 or 1-800-424-4372 ext 0060 (within Alaska, Idaho, Oregon and Washington).

Draft permits, Fact Sheets and other information can also be found by visiting EPA Region 10's website at: http://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID

The Fact Sheet and draft permit are also available at the following locations:

United States Environmental Protection Agency
Washington Operations Office
300 Desmond Dr. SE, Suite 102
Lacey, WA 98503
(360) 753-9457

Yakama Nation
Department of Natural Resources
Environmental Management Program
P.O. Box 151
Toppenish, Washington 98948

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Washington Beef LLC
NPDES Permit Number: WA-005020-2
Facility Contact: Sherry Byers-Eddy, Waste Water Manager

Facility Mailing Address:
P.O. Box 832
Toppenish, Washington 98948

Facility Location:
201 Elmwood Road
Toppenish, Washington 98948

II. FACILITY INFORMATION

A. Facility Description

Washington Beef LLC (Washington Beef) owns, operates, and has maintenance responsibility for a complex slaughterhouse facility located on the Reservation of the Confederated Tribes and Bands of the Yakama Nation (the "Yakama Nation"), in Toppenish, Washington. The facility includes a live animal holding area, beef cattle slaughter house with associated facilities for rendering, meat processing, hide brining, blood drying, and boxed meat warehouse and shipping. Effluent discharge from the facility will be to Wanity Slough via Outfall 002 or Spencer Lateral via Outfall 008. Additionally, this facility is capable of land applying its effluent, and has approximately 40 acres available for effluent land application. EPA does not have legal authority to regulate land application of effluent from the facility, therefore, land application will not be discussed in this fact sheet and there are no conditions related to land application in the draft permit.

The facility has applied for authorization to discharge its processing and sanitary wastewater effluent to either Wanity Slough or Spencer Lateral through Outfalls 002 or 008, respectively, as specified below in Table 1 below.

TABLE 1: Effluent Discharge Locations

Outfall	Latitude/ Longitude	Description	Discharge Location	Current Average Flow	Projected Average Flow within 5 years
002	N 46° 22' 11.58"/ E 120° 19' 14.04"	process and sanitary wastewater	Wanity Slough	0.92 mgd	1.6 mgd
008	N 46° 22' 14.84" E 120° 19' 29.98"	process and sanitary wastewater	Spencer Lateral	0.92 mgd	1.6 mgd

The 2008 NPDES application states that the facility will gradually increase its processing capability, over the next five years, from the current 1,816,875 pounds per day live weight killed (LWK) to 2,080,000 pounds per day LWK. This increase in production will result in an increase in effluent flow (i.e., flow will increase from 0.92 mgd to 1.6 mgd).

B. Permit History

On February 28, 1994, EPA issued an NPDES permit to Washington Beef, Inc.[1] The permit became effective on March 31, 1994 and authorized the following discharges to Wanity Slough:

Outfall 001: non-contact cooling water
Outfall 002: treated process wastewater
Outfall 003: non-contact cooling water
Outfall 004: ground water well bypass
Outfall 005, 006, and 007: trough water overflow, winter only

Prior to the March 31, 1999 expiration date of the permit, Washington Beef, Inc. submitted a permit renewal application (dated September 29, 1998). Thus, pursuant to the federal regulations at 40 CFR 122.6 and 122.21(d), the 1994 permit was administratively extended and continues to be in effect until a new permit is issued.

In a letter dated August 26, 2002, EPA notified Washington Beef, Inc. that the agency was in the process of drafting a new permit and requested an updated permit application as well as all monitoring data for the effluent and receiving water to ensure the draft permit accurately reflects conditions at the facility. On September 30, 2002, EPA received a revised NPDES permit application for the facility along with the requested monitoring data for the effluent from Outfalls 001 and 002 and the receiving water (*i.e.*, Wanity Slough). The application stated the facility processed 1,250,000 pounds LWK of cattle, and identified five (5) outfall locations where effluent was discharged to Wanity Slough. The five (5) outfall discharges to Wanity Slough were:

Outfall 001: non-contact cooling water
Outfall 002: treated process wastewater
Outfall 005, 006, and 007: trough water overflow

On approximately May 15, 2003, Washington Beef LLC notified EPA that it acquired substantially all assets of Washington Beef, Inc. On April 28, 2004, EPA issued a public notice for the proposed draft permit. The draft permit included effluent limitations and monitoring requirements for the five outfalls that discharge to Wanity Slough. Washington Beef submitted comments on June 24, 2004 in response to the proposed draft permit. Washington Beef commented that the draft permit did not incorporate the changes made to the facility's treatment system as a result of the *Comprehensive Water Management Plan* developed in cooperation with the Yakama Nation (*i.e.*, the facility had added an artificial wetland, a land application site, and a new effluent discharge location to Spencer Lateral). Specifically, after treatment, the treated process wastewater goes either to the UV disinfection system and is then discharged to Wanity Slough via Outfall 002, or it goes to a three cell artificial wetland and is then either land applied, or discharged to Spencer Lateral

[1] Washington Beef, Inc. was the owner of the facility at the time the permit was issued in 1994.

via Outfall 008. The comment letter further states that Spencer Lateral is an irrigation canal that ultimately is either used for irrigation purposes or supports a small tribal wetland area. Based on the information in Washington Beef's comment letter, EPA sent a request for information to Washington Beef on January 5, 2005. EPA requested a revised application from Washington Beef to ensure that when EPA revised the draft permit it accurately reflected the conditions at the facility. EPA requested that the new application include information about when the facility will (1) land apply its effluent, (2) discharge the effluent to Spencer Lateral, and/or (3) discharge the effluent to Wanity Sough. Washington Beef did not submit a revised application but they did submit supplemental information on February 7, 2005 in response to EPA's request for information.

Based upon this new information, EPA revised the draft permit and fact sheet. Since substantive changes were made to the draft permit, including allowing the facility to discharge treated process wastewater to Spencer Lateral as well as Wanity Slough, EPA re-opened the public comment period. On January 4, 2006, EPA issued a public notice for the draft permit. The draft permit proposed to authorize the following (6) discharges:

Outfall 001: non-contact cooling water – discharge to Wanity Slough
Outfall 002: treated process wastewater – discharge to Wanity Slough
Outfall 005, 006, and 007: trough water overflow – discharge to Wanity Slough
Outfall 008: treated process water – discharge to Spencer Lateral

Washington Beef commented on the draft permit in a letter dated January 10, 2006. This letter stated that Washington Beef was remodeling the processing plant to expand the processing capability and increase efficiencies. The letter stated that production would increase from 1,250,000 pounds LWK to 1,875,000 LWK.

In a letter dated March 9, 2007, Washington Beef submitted another updated NPDES application. The cover letter to the application states that Washington Beef remodeled a portion of its processing plant and the facility will gradually increase the processing capability, over the next five years, from the current 1,562,500 pounds per day LWK to 1,875,000 pounds per day LWK. The cover letter also states that an increase in potable water will be required to accommodate the increase in processing. The average monthly discharge rate is expected to be 0.95 mgd, and the daily maximum discharge rate is expected to be 1.25 mgd. The application identified four (4) outfall locations (a separate outfall for non-contact cooling water discharge has been eliminated). The outfalls discharge to either Wanity Slough or Spencer Lateral as follows:

Outfall 002: treated process wastewater – discharge to Wanity Slough
Outfall 005, and 006: trough water overflow – discharge to Wanity Slough
Outfall 008: treated process water – discharge to Spencer Lateral
On November 14, 2008, Washington Beef submitted an additional updated NPDES application, which stated that the facility currently has a LWK of 1,816,875 pounds per day and expects to gradually increase production to 2,080,000 pounds per day within 5 years. The current average monthly discharge rate is 0.92 mgd, and the facility expects the flow to

increase the flow to 1.6 mgd within 5 years. The application requests authorization to discharge processing and sanitary wastewater from 2 outfall locations: Outfall 002 discharges to Wanity Slough and Outfall 008 discharges to Spencer Lateral. Since the most recent application only requests authorization to discharge from Outfalls 002 and 008, the permit does not authorize discharges from Outfalls 005 and 006.

C. Treatment

The facility currently provides the following treatment for its processing wastes: rotary drum screen, dissolved air floatation, anaerobic lagoon, barrier basin, sequential batch reactor, surge basin. From the surge basin the effluent may be routed to a dissolved air floatation unit, then to an ultraviolet disinfection system, and finally to Outfall 002 which discharges to Wanity Slough (Outfall 002 has a diffuser to facilitate effluent mixing in Wanity Slough); alternatively, the effluent from the surge basin may be routed to a series of 3 artificial wetlands and it is then either land applied or discharged through Outfall 008 which discharges to Spencer Lateral (Outfall 008 does not have a diffuser). The facility also treats 0.04 mgd of sanitary wastewater. The treatment train for this waste stream is identical to the treatment described above for process water except this waste stream is not sent through the rotary drum screen and the dissolved air floatation treatment steps.

III. RECEIVING WATER

A. Receiving Water and Low Flow Conditions

Wanity Slough

A portion of the flow from the Yakima River flows into Wanity Slough, a natural water body, near Parker, Washington (approximately 10 miles north of Toppenish, Washington) and continues south, entering the Marion Drain which then flows into the Yakima River just south of Granger, Washington.

There is no stream gauge upstream of Washington Beef's Outfall 002, therefore, stream flow data for Wanity Slough, upstream of Outfall 002, is not available. Stream flow data is used to calculate the 1Q10 and 7Q10 low flows for a stream. The 1Q10 and 7Q10 low flow conditions are used to determine water quality based effluent limits (low flow conditions are defined by EPA in the *Technical Support Document for Water Quality-based Toxics Control* (TSD, March 1991, EPA/505/2-90-001)). When flow data does not exist it is not possible to calculate the 1Q10 and 7Q10 flow conditions and EPA assumes the low flow condition is zero. However, on July 23, 1993, prior to issuance of the 1994 permit, a stream survey was conducted in Wanity Slough to characterize it's assimilative capacity (see *Fact Sheet for Draft NPDES Permit No. WA-005020-3, Washington Beef, Inc.,* January 8, 1994, and Technical Appendix, Brown and Caldwell, February 9, 1994). The stream survey data was used to model an approximate 7Q10 flow in Wanity Slough. The dilution capacity during the stream survey, which is typical for irrigation period flows, was 25 parts total mixed stream volume to 1 part effluent volume (25:1) at the mixing zone boundary. However, this value is not representative of the flow that occurs during non-irrigation periods therefore a minimum dilution value was modeled. Channel geometry and flow data were used to estimate minimum, or 7Q10, stream flow in Wanity Slough. This was determined to be 11.3 cfs (7.3 mgd). The water quality-based effluent limits in the 1994 permit were established using this flow. EPA has used this flow value when developing effluent limitations in this proposed permit.

Spencer Lateral

Spencer Lateral is operated and controlled by the Wapato Irrigation Project (WIP). On July 6, 2005, an EPA compliance officer walked Spencer Lateral to determine if water from Spencer Lateral flows to other waters of the United States (U.S.). The compliance officer found that Spencer Lateral discharges to waters of the U.S. at the following locations:

(1) A gate in Spencer Lateral may be opened by WIP employees. When the gate is open, flow from Spencer Lateral goes to Spencer Drain which then flows to Wanity Slough, a water of the U.S. According to WIP employees the gate is typically open October 15 through March (see *NPDES Compliance Report of Reconnaissance, Washington Beef and the Spencer Lateral*; Robert Grandinetti, EPA, Region 10; July 6, 2005). Furthermore, the gates are made of wood, and even when closed it was found that water from Spencer Lateral leaks through the gate and enters Wanity Slough. On May 26, 2009 an EPA Inspector documented that flow from Spencer Lateral enters Wanity Slough even when the gate is

closed (see *Photographic Documentation Spencer Lateral Connection to Waters of the United States, Spencer Lateral During Irrigation Season Discharging to Wanity Slough*; Robert Grandinetti, EPA, Region 10; May 26, 2009).

It should be noted that on August 6, 2009 EPA Region 10 staff met with representatives of Washington Beef. Washington Beef stated that they have gotten an agreement with the WIP to ensure that the gate between Wanity Slough and Spencer Lateral remains closed such that water from Spencer Lateral will not flow to Wanity Slough. Additionally, they believe they can work with the WIP to ensure that the gate between Wanity Slough and Spencer Lateral is fixed such that there is only very minor leakage from the gate.

(2) At the end of Spencer Lateral the water drains to Harris Drain which then flows to the Yakima River, a water of the U.S. (see *NPDES Compliance Report of Reconnaissance, Washington Beef and the Spencer Lateral*; Robert Grandinetti, EPA, Region 10; July 6, 2005)

Since the Spencer Lateral is tributary to "waters of the United States," it is a "waters of the United States" within the meaning of the federal regulation at 40 CFR 122.2. EPA does not have information on flow volumes in Spencer Lateral, therefore, EPA will assume that the critical low flow is zero. Additionally, in January 2008, a compliance inspection was conducted. During the inspection it was found that the facility was discharging its effluent to Spencer Lateral. The effluent flow comprised the entire flow in Spencer Lateral, confirming that the low flow for Spencer Lateral is zero (see *EPA Compliance Inspection Report* for NPDES permit number WA0050202; January 23, 2008).

Wetlands

On November 5, 2008 Washington Beef met with EPA. During this meeting Washington Beef stated that they may use some, or all, of the water discharged to Spencer Lateral to restore wetlands located on Yakama Tribal lands[2]. The facility is currently working with the Yakama Nation on the wetland restoration project. Discharge to the wetlands would occur primarily in the summer months, however Washington Beef did not know when they would start sending water to the wetland. The location of the wetland is adjacent to the Yakima River (see Appendix A). EPA has considered that the effluent discharged from the facility to Spencer Lateral may be diverted to restore wetlands, and has determined that the effluent limits in this permit for outfall 008 will be protective of wetland uses described in the Yakama Nation water quality standards.

As stated previously, on August 6, 2009 EPA Region 10 staff met with representatives from Washington Beef. During this meeting, Washington Beef disclosed that once the wetland restoration project is completed, the wetland may no longer be a Clean Water Act

[2] The Yakama Nation Water Quality Standards define a wetland as "…any area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, such as swamps, marshes, bogs, and similar areas. This includes wetlands created, restored, or enhanced as part of a mitigation procedure. This does not include constructed wetlands intentionally constructed from non-wetland sites."

jurisdictional water body (i.e., it would not be considered a waters of the United States) and therefore not subject Section 402 of the CWA. Upon completion of the restoration project, EPA will re-evaluate the status of the wetland. If the wetland is not considered waters of the United States, the permit may be revised to remove effluent limitations for Outfall 008.

B. Water Quality Standards

General Information

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires that NPDES permits contain limitations, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to State law or regulations, or any Federal law or regulation, or required to implement any applicable water quality standard pursuant to the CWA.

Under the CWA implementing regulations, water quality standards consist of designated uses for waterbodies (e.g., aquatic life, contact recreation, etc), numeric or narrative criteria to protect those uses, and an antidegradation policy to maintain water quality (see 40 CFR Part 131). Such standards serve both as a description of the desired water quality for particular waterbodies and as a means of ensuring that such quality is attained and maintained.

Section 101(a) of the CWA states "…it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983…." EPA has treated this interim goal as a rebuttable presumption in its water quality standards regulation, and in implementing the water quality standards program. For example, EPA's water quality standards regulation requires States and Tribes to conduct a use attainability analysis whenever the State or Tribe wishes to remove a designated use that is specified in section 101((a)(2) of the CWA or to adopt subcategories of such uses which require less stringent criteria (see 40 CFR 131.10(j)). Furthermore, when EPA has found that the State did not conduct such an analysis as required above, EPA has used this rebuttable presumption, when promulgating Federal water quality standards (see EPA's promulgation of water quality standards for the State of Idaho, 62 FR 41161 (July 31, 1997), see also *Idaho Mining Association v. Browner*, 90 F. Supp 2d 1078 (D. Idaho 2000)(upholding the rebuttable presumption approach). Furthermore, EPA believes that the objectives of restoring and maintaining water quality support the designation of the most protective attainable use for the waterbody. For example, if full primary contact recreation use is not attainable, EPA would nevertheless include some requirements in the discharge permit to limit bacterial contamination in order to provide the next best attainable level of protection (e.g., secondary contact recreational use or a seasonal recreational use if EPA determined such uses were attainable).

Washington State Water Quality Standards

The Washington Beef discharge to Wanity Slough and Spencer Lateral occurs in waters of the Yakama Nation which is located in south/central Washington. The State of Washington is downstream from the discharge. The State of Washington has EPA-approved water

quality standards; however, Washington does not have the authority to issue NPDES permits on tribal lands. Moreover, since Washington does not have Clean Water Act authority on tribal lands or in tribal waters, the Washington water quality standards are not directly applicable within the tribal reservation. EPA regulation at 40 CFR 122.4(d) does, however, prohibit EPA from issuing a permit when the "imposition of conditions cannot ensure compliance with the applicable water quality requirement of all affected states," including downstream states. Since Washington State waters are approximately 10 miles downstream of the effluent discharge from Washington Beef, the effluent limitations in this permit are not likely to affect Washington water quality standards provided there is adequate assimilative capacity in the receiving waters on tribal land. However, if the receiving waters already exceed the water quality standard then the effluent limitations in the permit must ensure that Washington water quality standards will be achieved when the discharge reaches waters under Washington's jurisdiction. This can be achieved by ensuring that the effluent discharge meets the water quality criteria prior to being discharged to the receiving water. In this case, the receiving waters do not have assimilative capacity for bacteria, turbidity, pH, dissolved oxygen, and biochemical oxygen demand.

Tribal Water Quality Standards

In 1987, Congress amended the CWA to add Section 518 which allows the Administrator of EPA to treat a Tribe in the same manner as a State (i.e., commonly referred to as "treatment as a State" (TAS) for purposes of various Clean Water Act provisions (e.g., implementing the water quality standards program, and developing water quality standards for CWA purposes) provided that the Tribe meets certain eligibility criteria. EPA's implementing regulations at 40 CFR 131.8 contain the criteria in Section 518 of the CWA that Tribes must meet in order to be eligible to administer a water quality standards program. The regulation at 40 CFR 131.8 also establishes procedures for the EPA Regional Administrator to receive and make determinations on Tribal applications.

The Yakama Nation submitted an application for TAS in 1994, however, EPA is awaiting additional information from the Yakama Nation before it can approve the TAS application. In November 2005, the Yakama Nation adopted the *Yakama Nation Water Quality Standards*. However, because the Yakama Nation does not have TAS status, there are no EPA-approved water quality standards for Clean Water Act permitting purposes on the Yakama Nation reservation.

In 1993, EPA issued the *Guidance on EPA's NPDES and Sludge Management Permit Procedures on Federal Indian Reservations* (from Cynthia Doughtery to Water Management Division Directors Regions I – X, November 16, 1993) which set forth EPA's position on NPDES permitting on tribal lands. This memo states that EPA Regions should work with Tribes who have adopted water quality standards not yet approved by EPA to ensure that, to the extent practicable, NPDES permits issued on the reservation achieve compliance with those water quality standards. In addition, the memo states that "[u]ntil a Tribe is authorized under Section 303 [i.e., has TAS], EPA is the certification authority." 40 CFR § 121.21(b) requires that EPA issue 401 certifications where water quality standards have been established but there is no state/agency who has the authority to issue the certification. This

regulatory section implements Section 401(d) of the Clean Water Act which requires that a certification set forth the effluent limitations and other limitations and monitoring requirements necessary to assure that the permittee complies with the appropriate sections of the CWA, and with any appropriate requirements of State law.

Given the EPA guidance memo as well as the regulatory/statutory provisions, EPA believes it is appropriate to consider the Yakama Nation water quality standards when determining the applicable designated uses and criteria for Wanity Slough and Spencer Lateral as long as the water quality standards are consistent with Section 303 of the CWA, as well as EPA's implementing regulations at 40 CFR 131, and they are protective of downstream waters (i.e., Washington State waters).

Moreover, it should be noted that EPA has reviewed the State of Washington WQS and the Yakama Nation WQS and found that they are very similar. As such, EPA has determined that using the Yakama Nation WQS will be protective of the downstream waters in Washington State.

Designated Uses for Wanity Slough, Spencer Lateral, and Wetlands

1. Wanity Slough

The Yakama Nation's water quality standards apply the following uses to Wanity Slough (see Yakama Nation Water Quality Standards, 21.2.3.36):

- Cultural and religious uses
- Anadromous spawning, rearing and migration
- Aquatic life
- Wildlife habitat
- Recreation
- Ground water recharge
- Agricultural water supply and/or drainage
- livestock watering

2. Spencer Lateral

The Yakama Nation's water quality standards generally classify the Wapato Irrigation Project (Spencer Lateral is part of the Wapato Irrigation Project) as Class IV waters (see Yakama Nation Water Quality Standards, 21.2.3.37). Class IV waters are protected for: agricultural waters, livestock watering, domestic water, but only at the discretion of the Officer-in-Charge, and stock water supply. However, the Yakama Nation water quality standards for Class IV waters (see section 20.1.6.1) states:

> "…Note that since their construction, incidental to their designated uses, these waters have been subject to other beneficial uses and sustained or enhanced other resources, notably cultural uses, wildlife, … and fisheries. Because of the stock water and domestic water designated uses are sensitive uses requiring stringent standards it is assumed that these standards for Class IV waters shall be of sufficient quality to sustain these

additional uses…"

Additionally, the Yakama water quality criteria for Class IV waters, at part 20.1.6.2, states:

> "…waters discharged from Class IV waters into ground waters or a different class of waters shall be of such quality as to ensure that the receiving water is in compliance with the standards assigned to the receiving water…".

As stated previously, Spencer Lateral is tributary to Wanity Slough and the Yakima River, which are designated as Class III waters, therefore, Spencer Lateral should also designated as a Class III water (i.e., cultural and religious uses, anadromous spawning, rearing and migration, aquatic life, wildlife habitat, recreation, ground water recharge, agricultural water supply and/or drainage, and livestock watering).

Applicable Water Quality Criteria

The designated uses with the most protective water quality criteria in the Yakama Nation Water Quality Standards are anadromous spawning, rearing and migration, and cultural and religious uses. The water quality criteria associated with these designated uses will also be protective of the other applicable designated uses (e.g., aquatic life, wildlife habitat, etc).

For this facility, the *Effluent Limitation Guidelines and New Source Performance Standards for the Meat and Poultry Products Point Source Category* identify the pollutants of concern as: 5-day biochemical oxygen demand (BOD_5), total suspended solids, ammonia, total nitrogen, bacteria, and oil and grease. Additionally, based on a review of the monitoring data submitted by the facility, it was found that the water quality for temperature, dissolved oxygen, pH, and turbidity, the narrative aesthetics criterion, and the narrative "no toxics in toxic amounts" criterion may be affected by the discharge. The Yakama Nation Water Quality Standards do not contain specific criteria for BOD or total suspended solids, however, the water quality criteria for the remaining constituents are presented in Table 2 on the following page.

TABLE 2: Yakama Nation Water Quality Criteria

Parameter	Yakama Nation water quality criteria
pH	pH must be within the range of 6.5 to 8.5 standard units with a human-caused variation within the above range of less than 0.5 standard units (see Yakama Nation WQS 20.1.5.2)
Bacteria	E.coli bacteria levels shall not exceed a geometric mean value of 100 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than 10 sample points exist) greater than 200 colonies/100 mL (see Yakama Nation WQS 20.1.5.2)
Total Ammonia	Acute aquatic life criterion = 11.0 mg/L (see Yakama Nation WQS 13.3.3.3) Chronic aquatic life criterion = 2.6 mg/L (see Yakama Nation WQS 13.3.3.3,) (The criteria are developed using the 95th percentile temperature and pH data collected from Wanity Slough. There were 59 samples collected from 7/7/94 to 9/27/02. The 95th percentile temperature is 20.6 °C, and the 95th percentile pH is 7.62 s.u.).
Dissolved Oxygen	August 15 – May 31: exceed 10 mg/L to protect salmon spawning June 1 – August 14: exceed 8.5 mg/L (see Yakama Nation WQS 20.1.5.2). See discussion below.
Temperature	During non-irrigation season: 16° C as a 7 day daily average (see Yakama Nation WQS 20.1.5.2) During irrigation season: 18° C as a 7day daily average for Wapato Irrigation Project and Wanity Slough with no single daily maximum temperature exceeding 20 °C (see Yakama Nation WQS 20.1.5.3.1.7).
Aesthetics Values	All waters, including any established mixing zones, shall be free from substances, materials, floating debris, oil, grease, or scum attributable to any point source discharge or nonpoint source activity that: are in amounts sufficient to be visually displeasing, deleterious, a nuisance, or which interfere directly or indirectly with any beneficial use; will settle to form bottom or shoreline deposits which are putrescent, visually displeasing, or otherwise objectionable or will significantly alter the physical, chemical or biological properties of the bottom or shoreline; are in amounts that cause a visible sheen, film, iridescent appearance, or any discoloration of the surface of the water, on any objects in the water, on the adjoining shoreline, or on nearby sediments (see Yakama Nation WQS 13.3.2).
Turbidity	Turbidity shall not exceed a 90th percentile value of 25 NTU from discharges into Class III waters…or a net 5 increase over background conditions as measured at selected background sites when the turbidity ranges from 25 – 50 NT. (see Yakama Nation WQS 20.1.5.2.5) See discussion below.
Toxic Substances	Toxic substances shall not be introduced in waters of the Yakama Nation in amounts, concentrations, or combinations which adversely affect the beneficial uses, cause acute or chronic toxicity to the indigenous aquatic biota; are harmful to human, animal, plant or aquatic life; chemically change to harmful forms in the environment; accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety or welfare…(see Yakama Nation WQS 13.3.3)

Nutrients - The Yakama Nation Water Quality Standards contain criteria for nutrients (e.g., total nitrogen, phosphorus), however a March 20, 2008 e-mail from James Thomas of the Yakama Nation indicated that the nutrient criteria will need to be revisited. Therefore, nutrient criteria have not been included in Table 2.

Dissolved Oxygen (D.O.) –Washington requires a D.O. concentration of 8.0 mg/L. The Yakama Nation requires a D.O. concentration of 10 mg/L from August 15 through May 31st to protect salmonid spawning, and a D.O. concentration of 8.5 mg/L from June 1 through August 14th.

On July 23, 1993 a stream survey of Wanity Slough was conducted to characterize the receiving water characteristics. In-stream vertically averaged concentrations of dissolved oxygen were between 9.09 mg/L and 11.2 mg/L throughout the stream study area. These values are between 102.2% saturation and 119.1% saturation. It was postulated that the supersaturated D.O. values were due to large populations of rooted aquatic plants, which were observed throughout the stream (see 1994 fact sheet for Washington Beef). While supersaturation (i.e., greater than 100% saturation) sounds good it can indicate problems such as excessive plant growth. Aquatic plants produce oxygen by photosynthesis during daylight hours but they also use oxygen for respiration. During the night or on heavily overcast days, respiration removes oxygen from the water while photosynthesis stops or drastically slows down. Oxygen depletion in the water can occur, during the night or heavily overcast days, because of heavy plant growth. These wide daily fluctuations of D.O. can be stressful to aquatic organisms.

Dissolved oxygen data was collected by the Yakama Nation Water Resources Planning Program from March 1990 through April 1991. This data was collected upstream of lateral 4, and just downstream of the Washington Beef facility. Dissolved oxygen levels varied from 6.2 mg/L to 11.4 mg/L but did not exhibit an explicit flow period or seasonal relationship. Based on this data, the stream is not meeting either Washington's or the Yakama Nation's water quality standards.

Dissolved oxygen is a characteristic of a water body that can be affected by several different parameters such as temperature, physical characteristics (stream velocities, percent sediments, etc.), nutrients, sunlight, ammonia, etc. Because any oxygen demanding material or nutrients can negatively affect dissolved oxygen, meeting the criterion without allowing some insignificant decrease in dissolved oxygen would require disallowing any discharge of any pollutant that would affect dissolved oxygen. In this case, EPA believes that this is unnecessarily restrictive for the protection of designated uses, and would lead to unnecessary and costly expenditures. Therefore, EPA is requiring the facility to control BOD and D.O. concentrations such that the discharge has a non-measureable effect on dissolved oxygen levels in the water. Washington State describes a measureable change in D.O. as a decrease in D.O. of 0.2 mg/L (see WAC 173-201A-320).

Turbidity – The first part of the Yakama Nation turbidity criterion (i.e., Turbidity shall not exceed a 90^{th} percentile value of 25 NTU from discharges into Class III waters…) is intended to address agricultural discharges to waters on the reservation. The second part of the water quality standard is similar to Washington State's water quality standard which requires that "Receiving water shall not exceed 5 Nephelometric Turbidity Units (NTU) over background when the background concentrations are less than or equal to 50 NTU." Monitoring data for Wanity Slough from July 1994 through September 2003 ranged from 1.5 NTU to 76.2 NTU, with an average turbidity level of 7.4 NTU, therefore the allowable turbidity level is 12.4 NTU (i.e., 7.4 NTU + 5 NTU). Data does not exist for Spencer Lateral, but EPA believes it is reasonable to assume that the data would be similar to Wanity Slough, therefore the same value will be used.

Other Applicable Water Quality Standards- Mixing Zones

It is not always necessary to meet all water quality criteria within the discharge pipe to protect the integrity of the water body as a whole. Sometimes it is appropriate to allow for ambient concentrations above the criteria in a small area near the outfall. These areas are called mixing zones. Whether to allow mixing zones is a matter of State or Tribal discretion. Mixing zone characteristics should be established to ensure that:
(1) mixing zones do not impair the integrity of the water body as a whole,
(2) there is no lethality to organisms passing through the mixing zone, and
(3) there are no significant health risks, considering likely pathways of exposure (*Water Quality Standards Handbook: Second Edition*, chapter 5, EPA-8238B-94-005a).

Additionally, it is EPA's position that mixing zones should not be authorized for bacteria in rivers and streams (see November 12, 2008 memo from Ephraim King on *Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation*).

The Yakama Nation Water Quality standards do not allow mixing zones for acute aquatic life criteria, wetlands, intermittent or ephemeral streams, lakes or ponds, however, the standards do allow a maximum of 20% of the 7Q10 flow for chronic aquatic life criteria.

Both the Washington Water Quality Standards and the Yakama Nation Water Quality Standards confer authority to allow a mixing zone to the State and the Tribe, respectively. EPA does not have authority to issue mixing zones. However, in this case, the Washington State does not have jurisdiction over these waters and the Yakama Nation does not have TAS. EPA believes it is not reasonable to allow a mixing zone for the discharge to Spencer Lateral since the low flow is zero, however, it is reasonable to allow a mixing zone for the discharge to Wanity Slough, based on the Yakama Nation water quality standards. Based on the Yakima Nation water quality standards no mixing zone will be allowed for acute aquatic life criteria, and 20% of the low flow will be used for chronic aquatic life criteria if there is available assimilative capacity in the waterbody for a particular pollutant. A review of the receiving water data shows that a mixing zone may be appropriate for ammonia.

C. Water Quality Limits Streams

A water quality limited segment is any waterbody, or definable portion of a water body, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. Data collected in Wanity Slough indicates that the waterbody is not meeting water quality standards for dissolved oxygen.

Section 303(d) of the Clean Water Act requires States to develop a plan, known as a Total Maximum Daily Load management plan (TMDL), for water bodies listed as water quality limited. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's water quality standards and allocates that load to known point sources and nonpoint sources.

IV. PROPOSED EFFLUENT LIMITATIONS

A. Basis for Effluent Limitations

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 (see CWA 301(b), 33 USC § 1311(b)). A technology-based effluent limit requires a minimum level of treatment for a point source 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 bases for the proposed effluent limits are provided in Appendix B and C**.**

B. Proposed Effluent Limitations

Table 3 summarizes the proposed effluent limitations in the draft permit for Outfall 002 to Wanity Slough, and Table 4 summarizes the proposed effluent limitations in the draft permit for Outfall 008 to Spencer Lateral.

TABLE 3: Effluent Limitations for Outfall 002

Parameter	Units	Average Monthly Limit	Maximum Daily Limit	Minimum Daily Limit	Range
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	--	--
	lbs/day	400.3	600.5	--	--
Total Suspended Solids (TSS)	mg/L	39	78	--	--
	lbs/day	520	1040	--	--
Oil and Grease	mg/L	10	15	--	--
	lbs/day	133.4	200.2	--	--
E. Coli Bacteria	# / 100 ml	100	see note 1	--	--
pH	s.u.	---	---	--	6.5 - 8.5
Dissolved Oxygen	mg/L	---	---	6.8	---
Turbidity	NTU	12.4	50.3	--	--
Total Nitrogen	mg/L	134	194	--	--
	lbs/day	1788	2587.5	--	--
Total Ammonia as N	mg/L	2.9	11.2	--	--
	lbs/day	38.7	149.5	--	--
1. No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.					

TABLE 4: Effluent Limitations for Outfall 008

Parameter	Units	Average Monthly Limit	Maximum Daily Limit	Minimum Daily Limit	Range
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	--	--
	lbs/day	400.3	600.5	--	--
Total Suspended Solids (TSS)	mg/L	39	78	--	--
	lbs/day	520	1040	--	--
Oil and Grease	mg/L	10	15	--	--
	lbs/day	133.4	200.2	--	--
E. Coli Bacteria	# / 100 ml	100	see note 1	--	--
pH	s.u.	---	---	--	6.5 - 8.5
Dissolved Oxygen	mg/L	---	---	6.8	---
Turbidity	NTU	12.4	44.2	--	--
Total Nitrogen	mg/L	134	194	--	--
	lbs/day	1788	2587.5	--	--
Total Ammonia as N	mg/L	2.3	9.1	--	--
	lbs/day	30.7	121.4	--	--
1. No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.					

In addition to the proposed effluent limitations above, the following limitations shall also apply:

1. The permit does not authorize the discharge of any waste streams, including spills and other unintentional or non-routine discharges of pollutants, that are not part of the normal operation of the facility as disclosed in the permit application, or any pollutants that are not ordinarily present in such waste streams.

2. There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water.

C. Proposed Compliance Schedules for Ammonia, Turbidity, and Dissolved Oxygen

The Section 18 of the Yakama Nation water quality standards allows permits to contain a schedule of compliance for water quality based effluent limits. The 1994 permit contained water quality based effluent limits for ammonia, however, the proposed permit contains water quality based effluent limits for ammonia that are more stringent than those in the 1994 permit. Additionally, the proposed permit contains new water quality based effluent limits for turbidity and dissolved oxygen. Washington Beef has requested a compliance schedule for ammonia, turbidity and dissolved oxygen to allow them time to develop and construct the necessary treatment to meet the effluent limits. The proposed permit contains a compliance schedule

which requires compliance with the final limits within 2 years of the effective date of the new permit.

V. MONITORING REQUIREMENTS

A. Basis for Effluent and Receiving Water Monitoring Requirements

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent, and surface water data to determine if additional effluent limitations are required in the future, and/or to monitor effluent impacts on the receiving water. Therefore, receiving water, effluent, and biological monitoring have been incorporated into the draft permit. The permittee is responsible for conducting the monitoring and for reporting results with Discharge Monitoring Reports (DMRs) to EPA.

B. Proposed Effluent Monitoring Requirements

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

The 1994 permit requires effluent monitoring 5 times per week for BOD_5, TSS, pH, Temperature, Turbidity, Oil and Grease, Fecal Coliform, and Ammonia. EPA's *Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies* (April 1996) provides guidance on appropriate monitoring requirements in permits. The intent of the guidance is to reduce regulatory burdens associated with reporting and monitoring based on a demonstration of excellent historical performance by facilities subject to NPDES permit requirements. Based on this guidance the facility is only eligible for reduced monitoring frequencies for oil and grease. Monitoring for this parameter could be reduced to 2 times per week. In general, the facility has had a poor performance record, however, because of a recent enforcement action, the facility has taken steps to try to improve its current treatment system. Furthermore, the facility has requested a compliance schedule for several parameters in the proposed permit because they need some time to develop and construct additional treatment. Because of this, EPA believes that monitoring three times per week will be adequate for BOD_5, TSS, pH, turbidity, bacteria, total nitrogen, dissolved oxygen, and ammonia. However, the permittee will be required to monitor the effluent temperature daily from April 15th through September 30th each year[3], and monitor the effluent flow daily. Whole effluent toxicity monitoring is required to ensure that toxic pollutants or deleterious materials are not discharged

[3] Daily monitoring is required for temperature because the metric for the temperature water quality criterion is a 7-day average of the daily maximum temperature.

in concentrations which have the potential either singularly or cumulatively to adversely affect characteristic water uses, or cause acute or chronic conditions to the most sensitive biota dependent upon those waters. Table 5 presents the proposed effluent monitoring in the draft permit:

TABLE 5: Proposed Monitoring for Outfalls 002 and 008

Parameter	**Units**	**Frequency**	
		Outfall 002	Outfall 008
Effluent Flow	mgd	daily	daily
Biochemical Oxygen Demand (BOD_5)	mg/L	3/week	3/week
Total Suspended Solids (TSS)	mg/L	3/week	3/week
Oil and Grease	mg/L	2/week	2/week
E.coli Bacteria	# / 100 ml	3/week	3/week
pH	s.u.	3/week	3/week
Temperature April 15 – September 30 each year	°C	daily	daily
Dissolved Oxygen	mg/L	3/week	3/week
Total Nitrogen	mg/L	3/week	3/week
Total Ammonia as N	mg/L	3/week	3/week
Turbidity	NTU	3/week	3/week
Whole Effluent Toxicity – Chronic[1]	TU_c	Quarterly	Quarterly
1. Whole effluent toxicity testing is required quarterly until 10 valid samples are collected, see Part VI. C. below.			

C. Proposed Receiving Water Monitoring Requirements

The purpose of receiving water monitoring is to determine water quality conditions as part of the continuing effort to evaluate if an effluent discharge is meeting water quality criteria (40 CFR §122.44).

Table 6 summarizes the receiving water monitoring requirements proposed in the draft permit for Wanity Slough. All samples must be grab samples. Samples must be collected for 3 years. The upstream and downstream sample location must be as close as possible to the mid-point of Wanity Slough. The upstream sample location must be outside the influence of Outfall 002; and the downstream location must be at a location where the effluent is completely mixed with the receiving water, and prior to any drains or discharges into Wanity Slough.

TABLE 6: Receiving Water Monitoring Requirements for Wanity Slough

Parameter	Units	Sample Frequency		Special Conditions
		Upstream	Downstream	
Biochemical Oxygen Demand (BOD_5)	mg/L	1/month	---	---
Dissolved Oxygen	mg/L	1/week	1/week	Samples must be collected in the morning between 5 a.m. and 6 a.m.; and in the evening between 5 p.m. and 6 p.m.
pH	s.u.	1/week	---	---
Temperature April 15 – September 30	°C	daily	daily	Sampling for temperature must occur between 5 p.m. and 6 p.m.
Total Ammonia as N	mg/L	1/month	---	---
Turbidity	NTU	1/month	---	---
E.coli bacteria	#/100 ml	1/week	---	---

Table 7 summarizes the receiving water monitoring requirements proposed in the draft permit for Spencer Lateral. All samples must be grab samples. Samples must be collected for 3 years. The upstream and downstream location must be as close as possible to the mid-point of the lateral. The upstream sample location must be outside the influence of Outfall 008; and the downstream location must be at least 100 feet downstream of Outfall 008, and prior to any drains or discharges into the lateral.

TABLE 7: Receiving Water Monitoring Requirements for Spencer Lateral

Parameter	Units	Sample Frequency		Special Conditions
		Upstream	Downstream	
Biochemical Oxygen Demand (BOD_5)	mg/L	1/month	---	---
Dissolved Oxygen	mg/L	1/week	1/week	Samples must be collected in the morning between 5 a.m. and 6 a.m.; and in the evening between 5 p.m. and 6 p.m.
pH	s.u.	1/week	---	---
Temperature April 15 – September 30	°C	daily	daily	Sampling for temperature must occur between 5 p.m. and 6 p.m.
Total Ammonia as N	mg/L	1/month	---	---
Turbidity	NTU	1/month	---	---
E.coli bacteria	#/100 ml	1/week	---	---

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 complete, accurate and representative of the environmental or effluent condition. The facility is required to update and implement the Quality Assurance Plan (QAP) within 60 days of the effective date of the final permit. The QAP shall be prepared in accordance with EPA guidance documents (*EPA Requirements for Quality Assurance Project Plans*, EPA/QA/R-5, and (*Guidance for Quality Assurance Project Plans*, EPA/QA/G-5), and consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The QAP must be retained on site and made available to EPA upon request.

B. Best Management Practices (BMP) Plan

Section 402 of the Clean Water Act and federal regulation 40 CFR 122.44(k) authorize EPA to require BMPs in NPDES permits, when applicable. BMPs are measures for controlling the generation of pollutants and their release to waterways. These measures are typically included in the facility Operation & Maintenance (O&M) plans and are important tools for waste minimization and pollution prevention.

The draft permit requires that the permittee develop a BMP plan and implement BMPs within 60 days of the effective date of the draft permit. EPA has a guidance manual (EPA, 1993) that may provide some assistance in the development of BMPs. Specifically, the permittee must consider spill prevention and control, optimization of chemical use and water conservation. Furthermore, it is considered a good management practice to maintain a log of daily plant operations and observations. To the extent that any of these issues have already been addressed, the permittee need only reference the appropriate document/section in its O&M plan. Additionally, the BMP plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

C. Whole Effluent Toxicity (WET) Testing

The national policy in section 101(a)(3) of the CWA states that discharges of toxic substances in toxic amounts be prohibited. The Yakama Nation's narrative water quality standards for toxics states "Toxic substances shall not be introduced in waters of the Yakama Nation in amounts, concentrations, or combinations which adversely affect the beneficial uses, cause acute or chronic toxicity to the indigenous aquatic biota….". In addition, the federal regulation at 40 CFR §122.44(d)(1) requires the permitting authority to determine if a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion of a narrative criterion for whole effluent toxicity. To make this determination, effluent WET testing is required. The WET tests use vertebrate and invertebrate species or plants to measure the aggregate effect of all toxicants in the effluent.
The current permit specified acute toxicity testing using rainbow trout (*Oncorhynchus mykiss*) and chronic toxicity testing using fathead minnow (*Pimephales promelas*) and water flea (*Ceriodaphnia dubia*). Table 8 summarizes the test results:

TABLE 8: Whole Effluent Toxicity Result

Date	Parameter	*C. dubia*		*P. promelas*		*O. mykiss*
		Survival	Reproduction	Survival	Reproduction	Survival
December 1994	NOEC	25%	6.25%	100%	100%	100%
	Toxic Units (TU)	4	16	< 1	< 1	< 1
March 1995	NOEC	100%	50%	100%	100%	100%
	Toxic Units (TU)	< 1	2	< 1	< 1	< 1
May 1995	NOEC	100%	100%	100%	100%	100%
	Toxic Units (TU)	< 1	< 1	< 1	< 1	< 1
August 1995	NOEC	100%	100%	100%	100%	100%
	Toxic Units (TU)	< 1	< 1	< 1	< 1	< 1
October 1995	NOEC	100%	25%	100%	100%	100%
	Toxic Units (TU)	< 1	4	< 1	< 1	< 1

EPA has evaluated Washington Beef's discharge in accordance with EPA's policy for controlling the discharge of toxic substances. The *Technical Support Document for Water Quality-based Toxics Control* (TSD) (EPA, 1991) recommends a minimum of ten samples in order to quantify effluent variability and determine reasonable potential, the draft permit includes a quarterly monitoring frequency, until 10 valid samples are collected, for chronic toxicity using the most sensitive species, *Ceriodaphnia dubia*. The data gathered will be used to determine if a whole effluent toxicity limit is needed at the time of the next permit reissuance.

VII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act of 1973

Section 7 of the Endangered Species Act requires Federal agencies to consult with the National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries) and the U. S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species.

There are three species listed as threatened near the Washington Beef facility: Middle Columbia River steelhead (O.mykiss), Bull trout (Salvelinus confluentus), and Ute Ladies'-tresses (spiranthes diluvialis).
EPA has determined that the issuance of this permit will have no effect Bull trout or Ute Ladies'-tresses, and is not likely to adversely affect the Mid-Columbia steelhead. EPA made the determination that Bull trout are not in the area of the discharge, and Ute Ladies'-tresses is not found within streams and therefore will not be impacted. Steelhead are within the area of the discharges and EPA made the determination that steelhead are not likely to be adversely affected

because the draft permit contains effluent limitations based on criteria that is designed to be protective of aquatic life.

EPA will provide the NOAA-Fisheries with copies of the fact sheet, draft permit, and Biological Evaluation during the comment period. Any comments received by the Agency will be considered before final issuance of the permit. (see Appendix E, and the Biological Evaluation for further details).

B. Essential Fish Habitat (EFH)

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 requires EPA to consult with the NOAA-Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. EPA has tentatively determined that the reissuance of this permit will not adversely affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action. This fact sheet and the draft permit will be submitted to NOAA-Fisheries for review during the public notice period. Any recommendations received from NOAA-Fisheries regarding EFH will be considered prior to final reissuance of this permit. See Appendix F for further details.

C. Water Quality Standards Certification

Since the discharge is from a facility located within the boundaries of the Yakama Reservation, and the Tribe is not authorized under Section 303 of the CWA, EPA is the certification authority (see 40 CFR 121.1(e), and 40 CFR 121.21(b)).

D. Interstate Waters

Under Section 401(a)(2) of the CWA, EPA must give notice of this permit action to any affected state. Notice has been given to Washington Department of Ecology. A copy of the proposed permit action has also been provided to the Yakama Nation.

E. Standard Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are 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.

F. Permit Expiration

Section 402(1)(B) of the Clean Water Act requires 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.

G. Facility Changes or Alterations

In accordance with 40 CFR §122.41(l), the facility is required to notify EPA and the Yakama Nation's Environmental Management Program of any planned physical alteration or operational changes to the facility. This requirement has been incorporated into the proposed permit to ensure that EPA and the Yakama Nation are notified of any potential increases or changes in the amount of pollutants being discharged and evaluate the impact of the pollutant loading on the receiving water.

VIII. REFERENCES

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* (TSD) U.S. Environmental Protection Agency, Office of Water, EPA/505/2-90-001, March 1991.

EPA. 1993. *Guidance Manual for Developing Best Management Practices (BMP).* U.S. Environmental Protection Agency, Office of Water, EPA/833/B-93-004.

EPA. 1996. *U.S. EPA NPDES Permit Writer's Manual.* U.S. Environmental Protection Agency, Office of Water, EPA/833/B-96-003.

WDOE. 2006. *Water Quality Standards for Surface Water of the State of Washington, Chapter 173-201A WAC*. Washington State Department of Ecology, November 20, 2006.

Yakama Nation, 2005. *The Yakama Nation Water Quality Standards, Final Draft.* Yakama Nation Environmental Management Program, November 2005.

IX. ACRONYMS

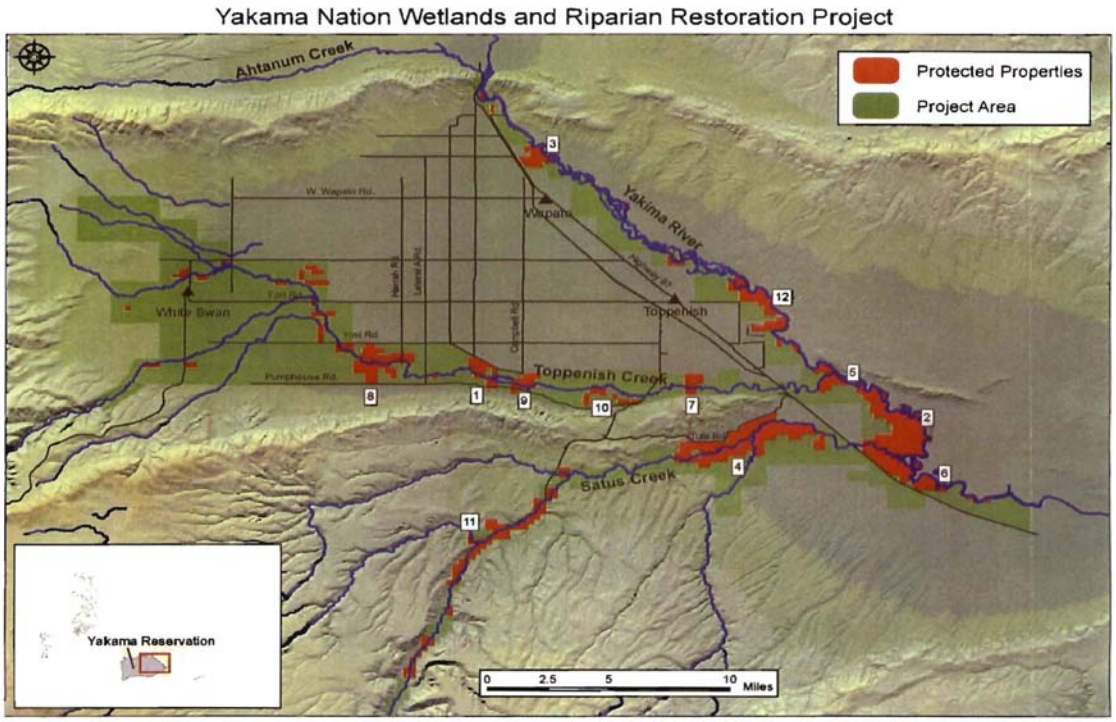
BMPs	Best management practices
BOD	Biochemical oxygen demand
BOD_5	Biochemical oxygen demand, five-day
EC	Degrees Celsius
CFR	Code of Federal Regulations
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
LA	load allocation
lb	pounds
mg/L	milligrams per liter
µg/L	micrograms per liter
mL	milliliter
N	Nitrogen
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric turbidity units
OW	Office of Water
QAP	Quality assurance plan
s.u.	Standard units
sp.	Species
TSD	Technical Support Document (EPA, 1991)
TSS	Total suspended solids
TU_c	Chronic toxic unit
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WQBEL	Water quality-based effluent limit

APPENDIX A

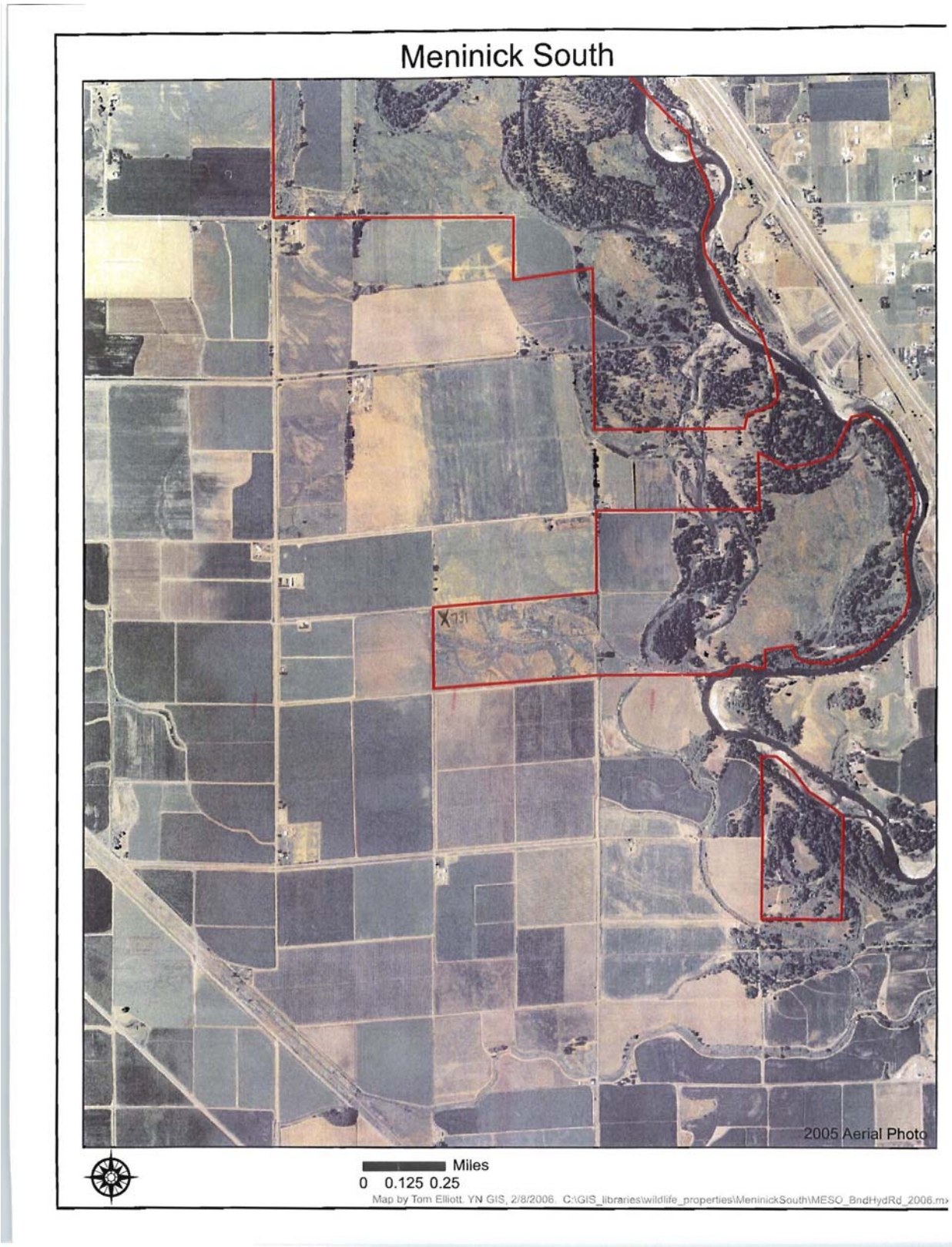
Location of Wetland Restoration Project

Map of Yakima Nations Wetland and Riparian Restoration Projects – Appendix A, page 2. This map provides an overview of all restoration projects on the Reservation. The proposed restoration project that Washington Beef is considering is located just south of parcel 12.

Menick South Map – Appendix A, page 3. This map provides a closer view of the wetland which may be restored by Washington Beef. The parcel of land is marked with an X in the upper left hand corner.



Overview of all restoration projects on the Reservation. The proposed restoration project that Washington Beef is considering is located just southwest of parcel 12.



This map provides a closer view of the wetland which may be restored by Washington Beef. The parcel of land is marked with an X in the upper left hand corner.

APPENDIX B
BASIS FOR EFFLUENT LIMITATIONS

I. Statutory and Regulatory Basis for Effluent Limits

Sections 101, 301(b), 304, 308, 401, 402 and 405 of the Clean Water Act provide the statutory basis for establishing the effluent limitations and other conditions in the draft permit. EPA evaluates discharges with respect to these sections of the Clean Water Act as well as the relevant NPDES regulations in determining which conditions to include in the permit. The technology-based effluent limits for this facility are described in Part II, below, and the basis and general information related to water quality-based effluent limits is presented in Part III. The CWA requires the effluent limits for a particular pollutant to be the more stringent of either technology-based limits or water quality-based effluent limits. Part IV. of this appendix compares the technology based effluent with the water quality based limits and determines the more stringent limit that will be incorporated into the draft permit.

II. Technology-Based Effluent Limits

Washington Beef is a complex slaughterhouse for which national effluent limitations guidelines (ELGs) have been promulgated[4]. Federal regulations at 40 CFR 432.22 and 432.23 (Subpart B - Complex Slaughterhouse Subcategory) are applicable to discharges resulting from the production of red meat carcasses, in whole or part, by complex slaughterhouses and specify standards of performance for 5-day Biochemical Oxygen Demand (BOD_5), total suspended solids (TSS), oil and grease, ammonia (as N), total nitrogen, and fecal coliform bacteria. Daily and monthly average limits are specified for BOD_5, TSS and oil and grease based on pounds per 1000 pounds live weight killed[5] (LWK). Table 1 presents the applicable guideline limits.

TABLE 1: Technology Based Effluent Guidelines

Regulated Parameter	Maximum Daily	Maximum Monthly Average
BOD_5	0.42 pounds/1000 pounds LWK	0.21 pounds/1000 pounds LWK
TSS	0.50 pounds/1000 pounds LWK	0.25 pounds/1000 pounds LWK
Fecal Coliform	400 CFU	N/A
Oil and Grease	0.16 pounds/1000 pounds LWK	0.08 pounds/1000 pounds LWK
Ammonia as N	8.0 mg/L	4.0 mg/L
Total Nitrogen	194 mg/L	134 mg/L

The federal regulation at 40 CFR 122.45(b) sets forth the requirements for calculating production-based effluent limitations. 40 CFR 122.45(b)(2)(i) states that permit limits which

[4] ELGs for this industrial category were promulgated on September 8, 2004 (69 FR 54476).
[5] Live weight kill is defined in 40 CFR 432.2 and means the total weight of animals slaughtered.

are based on production "...shall be based not upon the designed production capacity but rather upon a reasonable measure of actual production of the facility...." In general, EPA has determined that a single estimate of the expected production over the life of the permit using long term average production from the plant's historical records is an appropriate method to determine the reasonable measure of actual production of the facility (see EPA Memorandum on *Calculation of Production-Based Effluent Limits*, December 18, 1984). Usually, a five year production history is used to derive this value. The single production value is multiplied by both the daily maximum and monthly average guideline limitations. However, in this case, the facility has continually expanded its operation since approximately April 2005, therefore, using the last 5 years of data would not accurately reflect the processing occurring at this facility. Additionally, the facility has the physical capacity to process 1400 head (1,816,875 pounds per day), and the 2008 NPDES application stated that the facility expects to increase it production to 2,080,000 pounds per day, on average over the next five years. Because of the above, it is not possible to determine a reasonable measure of actual production. The regulation at 40 CFR 122.45(b)(2)(ii) (A)(*1*) allows EPA to include a condition establishing alternate permit limitations, standards, or prohibitions based upon anticipated increased (not to exceed maximum production capability) or decreased production levels. Since the facility expects to gradually expand its operation to 2,080,000 lbs per day over the life of the permit the draft permit will use the expected maximum production level to determine the technology-based effluent limits to allow the facility the flexibility it needs to expand production over the next five years.

The technology-based effluent limits for TSS, BOD_5, and oil and grease (O&G) are expressed as mass. The federal regulation at 40 CFR 122.45(f)(2) states that pollutants limited in terms of mass may also be limited in terms of other units of measurement. Therefore, the technology based limits for TSS, BOD_5, and O & G will be expressed as both mass-based and concentration-based limits.

The technology-based effluent limits for ammonia and total nitrogen are specified as concentration-based effluent limits. The federal regulation 40 CFR §122.45(f)(1) states that NPDES permits must also express the effluent limits in terms of mass-based limits. Therefore, technology based effluent limits will be expressed as both mass-based and concentration-based limits.

The technology-based effluent limit for fecal coliform bacteria is simply expressed as 400 CFU as a maximum daily limit.

The formulas for the proposed technology effluent limits for TSS, BOD_5, Oil and Grease, Ammonia, and Total Nitrogen are presented in Table 2. An example calculation is presented after Table 2 to show how the final technology effluent limits were derived. Table 3 presents the maximum allowable technology based effluent limit based on the maximum production capacity of the facility over the next 5 years.

TABLE 2: Technology-based Effluent Limitations for BOD, TSS, Oil and Grease, Ammonia, and Total Nitrogen

PARAMETER	UNITS	AVERAGE MONTHLY LIMIT[1]	MAXIMUM DAILY LIMIT[2]
BOD_5	#/day	(pounds LWK / day) x (0.21 lbs/1000 lbs LWK)	(pounds LWK / day) x (0.42 lbs/1000 lbs LWK)
	mg/L	(Average Monthly Limit in #/day) ÷ [(8.34) x (flow in mgd)]	(Maximum Daily Limit in #/day) ÷ [(8.34) x (flow in mgd)]
TSS	#/day	(pounds LWK / day) x (0.25 lbs/1000 lbs LWK)	(pounds LWK / day) x (0.50 lbs/1000 lbs LWK)
	mg/L	(Average Monthly Limit in #/day) ÷ [(8.34) x (flow in mgd)]	(Maximum Daily Limit in #/day) ÷ [(8.34) x (flow in mgd)]
Oil and Grease	#/day	(pounds LWK / day) x (0.08 lbs/1000 lbs LWK)	(pounds LWK / day) x (0.16 lbs/1000 lbs LWK)
	mg/L	(Average Monthly Limit in #/day) ÷ [(8.34) x (flow in mgd)]	(Maximum Daily Limit in #/day) ÷ [(8.34) x (flow in mgd)]
Ammonia	#/day	4.0 mg/L x [(8.34) x (flow in mgd)]	8.0 mg/L x [(8.34) x (flow in mgd)]
	mg/L	4.0 mg/L	8.0 mg/L
Total Nitrogen[3]	#/day	134 mg/L x [(8.34) x (flow in mgd)]	194.0 mg/L x [(8.34) x (flow in mgd)]
	mg/L	134 mg/L	194 mg/L

1. When determining the average monthly limit the term "pounds LWK" is equal to the total number of pounds LWK in a calendar month, the term "flow" is equal to the average monthly flow in a calendar month.
2. When determining the maximum daily limit the term "pounds LWK" is equal to the highest total number of pounds LWK in a single day during a calendar month; the term "flow" is equal to the highest daily flow in a calendar month.
3. Total Nitrogen is equal to the sum of total kjeldahl nitrogen plus nitrate/nitrite.

The following is an example calculation for BOD_5. This example assumes that the average monthly LWK, and maximum daily LWK are both equal to 2,080,000; and average monthly flow, and maximum daily flow are both equal to 1.6 mgd (i.e., the maximum values provided on the 2008 NPDES application for this facility.)

5-day Biological Oxygen Demand (BOD_5)

Monthly Average Loading = (2,080,000 lbs LWK / day) x (0.21 lbs/1000 lbs LWK)
= 436.8 lbs/day

Maximum Daily Loading = (2,080,000 lbs LWK / day) x (0.42 lbs/1000 lbs LWK)
= 873.6 lbs/day

Monthly Average Concentration = (436.8 lbs/day) ÷ [(8.34) x 1.6 mgd)]
= 32.7 mg/l

Maximum Daily Concentration = (873.6 lbs/day) ÷ [(8.34) x (1.6 mgd)] = 65.5 mg/l

A summary of the maximum allowable technology based limits, based on maximum production capability of the facility, and maximum flow are in the table below.

TABLE 3: Maximum Allowable Technology-based Effluent Limitations

Parameter	Units	Average Monthly Limit	Maximum Daily Limit	Instantaneous Limit
Biochemical Oxygen Demand	mg/l	32.7	65.5	NA
	pounds/day	436.8	873.6	NA
Total Suspended Solids	mg/l	39	78	NA
	pounds/day	520	1040	NA
Oil and Grease	mg/l	12.5	24.9	NA
	pounds/day	166.4	332.8	NA
Ammonia as N	mg/l	4.0	8.0	NA
	pounds/day	53.4	106.8	NA
Total Nitrogen	mg/l	134	194	NA
	pounds/day	1788.1	2588.7	NA
Fecal Coliform Bacteria	colonies/100 ml	NA	NA	400

III. Water Quality-Based Effluent Limits

This Part provides the regulatory and general information used to derive water quality based effluent limits. Section A, below, discusses the regulatory basis for water quality based effluent limits, Section B provides a brief description of the Reasonable Potential Analysis EPA uses to determine if water quality based effluent limits are needed, and Section C describes the general procedures for developing water quality based limits. The calculations for the Reasonable Potential Analysis can be found in Appendix C, and the water quality based effluent limit calculations can be found in Appendix D.

A. 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 by July 1, 1977. 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 water quality standard, including narrative criteria for water quality (see Part III.B. of the Fact Sheet for a discussion on applicable water quality standards).

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.

B. Reasonable Potential Analysis

In general, 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 exceedance of the applicable water quality standard, and a water quality-based effluent limit is required.

As stated previously, 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.

Appendix C contains the Reasonable Potential Analysis for ammonia, turbidity, bacteria, aesthetics, temperature, pH, and dissolved oxygen. Based on this evaluation, water quality based effluent limitations are needed for ammonia, turbidity, bacteria, aesthetics, pH, and dissolved oxygen (and BOD).

C. 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 exceedance of water quality standards in the receiving water.

In cases where a mixing zone is not authorized, or the receiving water already exceeds the applicable criterion, then the WLA is set equal to the criterion. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion.

As stated previously in the fact sheet, EPA believes it is not reasonable to allow a mixing zone for the discharge to Spencer Lateral since the low flow is zero, however, it is reasonable to allow a mixing zone for the discharge to Wanity Slough, based on the Yakama Nation water quality standards. Based on the Yakima Nation water quality standards no mixing zone will be allowed for acute aquatic life criteria, and 20% of the low flow will be used for chronic aquatic life criteria if there is available assimilative capacity in the waterbody. A review of the receiving water data shows that a mixing zone may be appropriate for the discharge of ammonia to Wanity Slough.

Once a WLA is developed, EPA calculates effluent limits that are protective of the WLA using statistical procedures described in chapter 5 of EPA's *Technical Support Document for Water Quality-based Toxics Control* (March 1991). See Appendix D for the calculation of water quality based effluent limits.

IV. Facility-Specific Effluent Limits

As discussed previously, the CWA requires the effluent limits for a particular pollutant to be the more stringent of either technology-based limits or water quality-based effluent limits. This section compares the technology based effluent with the water quality based limits and determines the more stringent limit that will be incorporated into the draft permit (see Part B of this Appendix for technology-based effluent limits, and Appendix D for water quality based effluent limits).

1. Biochemical Oxygen Demand (BOD_5) and Dissolved Oxygen (DO)

Effluent Parameter	Unit of Measurement	Monthly Average[2]	Maximum Daily
Maximum technology-based BOD_5 limit	mg/L (lbs/day)	32.7 (436.8)	65.5 (873.6)
Water quality-based BOD_5 limit	mg/L (lbs/day)	30 (400.3)	45 (600.5)
NOTE: Technology-based and water quality-based effluent limits are applicable to Outfall 002 and 008.			

The water quality-based effluent limitations are more stringent and will be included in the draft permit.
Additionally, the Streeter-Phelps analysis (see Appendix D) found that limits are also needed for dissolved oxygen. Since there are no technology-based effluent limits for D.O. the water quality-based limit of 6.8 mg/L will be included in the draft permit.

2. Turbidity and Total Suspended Solids (TSS)

The 1994 permit contained water quality based effluent limits for TSS. The water quality standards do not contain a numeric criterion for TSS, however, a TSS effluent limit was incorporated into the 1994 permit as a surrogate parameter to ensure that the effluent discharge did not cause or contribute to a water quality exceedance of the turbidity numeric criterion.

In general, Section 402(o) of the CWA and 40 CFR § 122.44(l) prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (*i.e.*, anti-backsliding). However, CWA Section 402(o)(2) does set forth some exceptions to anti-backsliding. One of the exceptions states that a less stringent effluent limitation can be included in a reissued permit if information is available which was not available at the time of permit issuance and which would have justified the application of a less stringent effluent limitation at the time of permit issuance (see Clean Water Act Section 402(o)(2)(B)(i)).

The TSS limits in the 1994 permit were water quality-based to ensure that the discharge did not cause or contribute to a water quality exceedance of the turbidity criterion (50 NTU). The TSS limits were calculated by assuming that TSS and turbidity were directly correlated with 1 mg/L of TSS equal to 1 NTU.

For this draft permit, water quality based effluent limits for turbidity were developed using turbidity monitoring data from Wanity Slough and the water quality criterion for turbidity (i.e., 12.4 NTU). The Wanity Slough monitoring data constitutes new information that was not available at the time of the last permit issuance, therefore, the draft permit proposes the following water quality based effluent limits for turbidity for Outfalls 002 and 008:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Outfall 002 (Wanity Slough)- Turbidity	NTU	12.4	50.3
Outfall 008 (Spencer Lateral)- Turbidity	NTU	12.4	44.2

There are no numeric water quality criteria for TSS, therefore, the draft permit includes the following technology-based limits for TSS for Outfalls 002 and 008:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Outfall 002 (Wanity Slough)- TSS	mg/L (lbs/day)	39 (520)	78 (1040)
Outfall 008 (Spencer Lateral)- TSS	mg/L (lbs/day)	39 (520)	78 (1040)

3. Oil and Grease

The 1994 permit included effluent limits for oil and grease which were water quality-based to ensure that the discharge did not cause or contribute to a water quality violation. The following compares the technology-based effluent limits with the water quality-based effluent limits

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Maximum technology-based limit	mg/L (lbs/day)	12.5 (166.4)	24.9 (332.8)
Water quality-based limit	mg/L (lbs/day)	10 (133.4)	15 (200.2)
NOTE: The technology-based, and water quality-based effluent limits are applicable to both Outfall 002 and 008l.			

The water quality-based effluent limits for oil and grease are more stringent and will be included in the draft permit.

4. Bacteria

The federal technology-based requirements require an instantaneous fecal coliform bacteria limit of 400 colonies/100 mL. The water quality based effluent limit for bacteria is 100 colonies/100 mL expressed as E.coli, with not more than 10% of the samples greater than 200 colonies/100 mL. The water quality-based effluent limit for E.coli will be incorporated into the permit for Outfalls 002 and 008.

5. Hydrogen ion concentration (pH)

There are no technology-based effluent limits for pH. The water quality based effluent limit for pH is 6.5 to 8.5 standard units. The 1994 permit required the effluent to be within the range of 6.5 to 8.5 standard units, these limits will be retained in the draft permit for Outfall 002 and 008.

6. Total Ammonia (NH_3 as N)

The following compares the technology based effluent limits with the water quality-based effluent limits:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Maximum technology-based limit	mg/L (lbs/day)	4.0 (53.4)	8.0 (106.8)
Water quality-based limit for Outfall 002	mg/L (lbs/day)	2.9 (38.7)	11.2 (149.5)
Water quality-based limit for Outfall 008	mg/L (lbs/day)	2.3 (30.7)	9.1(121.4)
NOTE: The technology-based effluent limits are applicable to both Outfall 002 and 008.			

The water quality-based effluent limits are more stringent and will be included in the draft permit.

7. Total Nitrogen

There are only technology-based effluent limits for total nitrogen, therefore, the technology limits will be incorporated into the permit.

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Technolgoy-based limit	mg/L	134	194
	lbs/day	1788.1	2588.7
NOTE: The technology-based effluent limits are applicable to both Outfall 002 and 008.			

8. Aesthetics

There is no technology-based effluent limit for aesthetics, therefore the permit will contain the following water quality based narrative requirement “There must be no discharge of floating solids or visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.”

APPENDIX C
Reasonable Potential Analysis

Part I of this appendix provides the reasonable potential analysis for bacteria, turbidity and ammonia; Part II provides the reasonable potential analysis for the aesthetic criterion; Part III provides the reasonable potential analysis for temperature; Part IV provides the reasonable potential analysis for pH; and Part V provides the reasonable potential analysis for dissolved oxygen.

I. Bacteria, Turbidity, Ammonia

EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential. The following summarizes the process EPA has used to determine if the effluent discharge of ammonia, turbidity, and bacteria have the reasonable potential to cause or contribute to a violation of water quality standards.

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 (C_d) is determined.

Mass Balance Equation

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

$$C_dQ_d = C_eQ_e + C_uQ_u \quad \text{where,}$$

C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone, if a mixing zone is appropriate)
C_e = Maximum projected effluent concentration
C_u = Maximum measured receiving water upstream concentration (the 95th percentile of the data set is used)
Q_d = Receiving water flow rate downstream of the effluent discharge = $Q_e + Q_u$
Q_e = Effluent flow rate (set equal to the highest discharge from facility)
Q_u = Receiving water low flow rate upstream of the discharge = 7.3 mgd for Wanity Slough and 0 mgd for Spencer Lateral

When the mass balance equation is solved for C_d, the receiving water concentration downstream of the effluent discharge, it becomes: $C_d = \frac{C_eQ_e + C_uQ_u}{Q_e + Q_u}$

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:

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

MZ is the fraction of the receiving water flow available for dilution (i.e., the mixing zone allowance).

When there is insufficient flow data to determine the low flow conditions, mixing zones are not authorized. Additionally, where the receiving water already exceeds the criterion there is no assimilative capacity in the water body, therefore a mixing zone cannot be authorized. In these cases the mass balance equation is reduce to:

$$C_d = C_e$$

Maximum Projected Effluent Concentrations (C_e)

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

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, and accounts for the statistical uncertainty in the effluent data. 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. When fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6. The following tables provide a summary of the effluent data, statistics, and maximum projected effluent concentrations for Outfall 002 and Outfall 008 for ammonia, turbidity, and bacteria.

TABLE 1: Outfall 002 (Discharge to Wanity Slough)

Summary of Effluent Data and Statistics Used in Reasonable Potential Calculation			
	Ammonia	**Turbidity**	**Fecal Coliform Bacteria[5]**
Date samples were collected	3/4/03 to 7/23/09	3/4/03 to 4/20/08	3/4/03 to 4/20/08
Number of samples collected	N/A	173	164
Maximum sample result	N/A	281 NTU	16000 colonies/100 ml
Standard deviation of data	N/A	46.1	NA
Mean of data set	N/A	23.1	NA
CV of data set	N/A	2	NA
RPM[1]	N/A	1.7	NA
C_e [2] (maximum projected effluent concentration)	8.0 mg/L, see note 4	477.7 NTU	NA
Q_e[3] (maximum effluent flow)	1.6 mgd	1.6 mgd	NA
Maximum geometric mean for fecal coliform bacteria	NA	NA	2605 colonies/100 ml
did 10% of fecal coliform samples exceed 200 colonies/100 ml	NA	NA	Yes (December 2003, November 2004, February 2008, March 2008)

1. RPM means "reasonable potential multiplier".
2. C_e = maximum projected effluent concentration = RPM x maximum sample result.
3. Q_e = maximum effluent flow within 5 years (see 2008 NPDES permit application).
4. C_e was not calculated based on past data because the maximum allowable technology based effluent limit for ammonia is 8.0 mg/L (see Appendix B). Therefore, the technology based limit will be considered the maximum projected effluent concentration ($C_{e)}$ when doing a reasonable potential calculation.
5. For bacteria, EPA does calculate maximum projected concentrations.

TABLE 2: Outfall 008 (Discharge to Spencer Lateral)

Summary of Effluent Data and Statistics Used in Reasonable Potential Calculation			
	Ammonia	**Turbidity**	**Fecal Coliform Bacteria**
Date samples were collected	8/6/03 to 1/9/08	8/6/03 to 1/9/08	8/6/03 to 1/9/08
Number of samples collected	218	218	218
Maximum sample result	120 mg/L	150 NTU	16,000 colonies/100 ml
Standard deviation of data	N/A	15.6	NA
Mean of data set	N/A	13.1	NA
CV of data set	N/A	1.2	NA
RPM[1]	N/A	1.3	NA
C_e [2] (maximum projected effluent concentration)	8 mg/L, see note 4	195 NTU	NA
Q_e [3] (maximum effluent flow)	1.6 mgd	1.6 mgd	NA
Maximum geometric mean for fecal coliform bacteria	NA	NA	10,360 colonies/100 ml
did 10% of fecal coliform samples exceed 200 colonies/100 ml	NA	NA	Yes (178 of the 218 samples collected exceeded the criterion)

1. RPM means "reasonable potential multiplier"
2. C_e = maximum projected effluent concentration = RPM x maximum sample result
3. Q_e = maximum effluent flow within next 5 years (see 2008 NPDES permit)
4. C_e was not calculated based on past data because the maximum allowable technology based effluent limit for ammonia is 8.0 mg/L (see Appendix B). Therefore, the technology based limit will be considered the maximum projected effluent concentration ($C_{e)}$ when doing a reasonable potential calculation.

Maximum Projected Receiving Water Concentrations (Cd)

As stated previously, a 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, Cd, exceeds the most stringent criterion for that pollutant using the following equation if a mixing zone is allowed:

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

If a mixing zone is not allowed, equation is reduced to the following:

$$C_d = C_e$$

The following table summarizes the monitoring data, applicable criteria and determines if a mixing zone allowance is appropriate for Wanity Slough for ammonia, turbidity and bacteria. This information is needed for Wanity Slough, because a mixing zone may be appropriate in some cases. For Spencer Lateral this information is not needed because a mixing zone is not appropriate. Following the table are the Reasonable potential analyses for bacteria, turbidity, and ammonia.

TABLE 3: Wanity Slough monitoring data, applicable criteria, mixing zone allowance

	Ammonia	**Turbidity**	**Fecal Coliform Bacteria**
Date samples were collected	4/19/94 to 9/27/02	7/4/94 to 9/27/96	4/19/94 to 2/21/95
Number of samples collected	12	44	6
mean of data	0.34 mg/L	7.4 NTU	NA
95th percentile of receiving water data set (C_u)	1.0 mg/L	16.8 mg/L	7325 colonies/100 ml
Critical low flow (Q_u)	7.3 mgd	7.3 mgd	7.3 mgd
Acute aquatic life criterion	11.0 mg/L	NA	NA
Chronic aquatic life criterion	2.6 mg/L	12.4 NTU	NA
Human health criterion	NA	NA	100 colonies/100 ml and not more then 10% of samples may exceed 200 colonies/100 ml
Does the receiving water exceed the criteria	No	Yes	Yes
Number of exceedences	NA	4 out of 44 samples	3 out of 6 samples
Is a mixing zone allowed?	Yes	No	No
Acute MZ allowance	0	NA	NA
Chronic MZ allowance	0.02	NA	NA

A. ***Bacteria***

The existing permit contains a water quality based effluent limit for fecal coliform bacteria. The *E. coli* criteria for the protection of human health is a geometric mean of 100 colonies/100 ml, with not more than 10 percent of all samples (or any single sample when less than ten samples exist) obtained for calculating the geometric mean value exceeding 200 colonies/100 ml. It is EPA's position that mixing zones should not be authorized for bacteria in rivers and streams (see November 12, 2008 memo from Ephraim King on *Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation*), therefore, even if there was assimilative capacity in Wanity Slough a mixing zone would not be authorized.

Effluent and receiving water data has not been collected for *E. coli*, however, EPA has determined that there is a reasonable potential for the discharge to cause or contribute to an exceedance of the *E. coli* criterion of 100 colonies/100 ml. EPA has made this determination based on the following reasons:

(1) The permittee discharges 0.04 mgd of sanitary wastes to their waste treatment system, and *E.coli* is found in sanitary wastes at high levels.

(2) Fecal coliform bacteria has been monitored at the facility and has been measured as high as 16,000 colonies per 100 ml, and the maximum geometric mean at the facility was 10,360 colonies per 100 ml. Coliforms are a group of bacteria that inhabit the intestinal tract of humans and animals. Their presence in water indicates fecal contamination and the possible presence of pathogens. Fecal coliform is a subgroup of coliform bacteria and it has a high correlation with fecal contamination of warm blooded animals. Similarly, *E.*

coli is a subset of the coliform group that is a normal part of the intestinal flora of humans and animals and is therefore a direct indicator of fecal contamination of water. Because the monitoring information for fecal coliform shows there is fecal contamination from warm blooded animals, it is highly likely that *E. coli* bacteria, which is also directly related to fecal contamination, is at levels that likely exceed the *E.coli* criteria.

(3) EPA's 1986 bacteria criterion document states that the *E. coli* criteria apply regardless of origin (i.e., regardless if the bacteria is from human source or non-human source) unless a sanitary survey shows that sources of the indicator bacteria are non-human and an epidemiological study shows that the indicator densities are not indicative of a human health risk. There have been several instances where studies have attributed disease outbreaks to non-human sources of fecal contamination (69 FR 41730 -41731). There have not been any epidemiological studies done for this facility that show the indicator densities are not indicative of a human health risk.

Since this facility has sanitary wastes, live animal holding area, beef cattle slaughter house, and high levels of fecal coliform bacteria it is likely that *E. coli* bacteria are present in elevated levels, therefore, water quality based effluent limits are needed for both Outfall 002 and 008.

B. *Turbidity*

1. Outfall 002 As can be seen from Table 3 (Wanity Sough monitoring data, applicable criteria, mixing zone allowance), Wanity Slough already exceeds the allowable turbidity criterion of 12.4 NTU. Therefore there is no available assimilative capacity in Wanity Slough and a mixing zone is not appropriate. The following equation is used to determine if water quality based effluent limits are necessary:

$C_d = C_e$

C_d = Receiving water concentration downstream of the effluent discharge, when a mixing zone is not appropriate, this parameter is measured at the end of the Outfall.

C_e = Maximum projected effluent concentration = 477.7 NTU (see Table 1)

$C_d = C_e = 477.7$ NTU

Since the maximum projected receiving water concentration exceeds the turbidity criterion of 12.4 NTU, a water quality based effluent limit is needed.

2. Outfall 008 A mixing zone is not appropriate in Spencer Lateral. The following equation is used to determine if water quality based effluent limits are necessary:

$C_d = C_e$

C_d = Receiving water concentration downstream of the effluent discharge, when a mixing zone is not appropriate, this parameter is measured at the end of the Outfall.

C_e = Maximum projected effluent concentration = 195 NTU (see Table 2)

$C_d = C_e$ = 195 NTU

Since the maximum projected receiving water concentration exceeds the turbidity criterion of 12.4 NTU, a water quality based effluent limit is needed.

C. *Ammonia*

1. Outfall 002 The following equation is used to determine if water quality based effluent limits are needed:

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

C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone; or at the end of the pipe if a mixing zone is not allowed)
C_e = Maximum projected effluent concentration = 8.0 mg/L
C_u = Maximum measured receiving water upstream concentration = 1.0 mg/L
Q_e = Effluent flow rate (set equal to the highest discharge from facility) = 1.6 mgd
Q_u = Receiving water low flow rate upstream of the discharge = 7.3 mgd
MZ (chronic) = 0.20
MZ (acute) = 0.0

$$C_d \text{ (chronic)} = \frac{(8.0)(1.6) + [1.0\ (7.3 \text{ X } 0.2)]}{1.6 + (7.3 \text{ X } 0.2)} = 4.7 \text{ mg/L}$$

C_d (acute) = C_e = 8.0 mg/L

The acute ammonia criterion is 11.0 mg/L and this criterion is not exceeded. However, the chronic ammonia criterion is 2.6 mg/L, and the chronic criterion is exceeded, therefore a water quality effluent limit is needed.

2. Outfall 008 - The following equation is used for the discharge to Spencer Lateral since mixing zones are not appropriate:

$C_d = C_e$

C_d (acute, and chronic) = 8 mg/L

The chronic ammonia criterion (2.6 mg/L) is exceeded, therefore a water quality effluent limit is needed.

II. Aesthetics criterion

The aesthetics criterion states:

> "All waters, including any established mixing zones, shall be free from substances, materials, floating debris, oil, grease, or scum attributable to any point source discharge or nonpoint source activity that: are in amounts sufficient to be visually displeasing, deleterious, a nuisance, or which interfere directly or indirectly with any beneficial use; will settle to form bottom or shoreline deposits which are putrescent, visually displeasing, or otherwise objectionable or will significantly alter the physical, chemical or biological properties of the bottom or shoreline; are in amounts that cause a visible sheen, film, iridescent appearance, or any discoloration of the surface of the water, on any objects in the water, on the adjoining shoreline, or on nearby sediments."

The aesthetics criteria are harder to quantify in terms of violations. However, EPA believes that photographic records or public complaints can provide a good indication of problems. If the source of such violation can be identified, control actions can be imposed by the regulatory agency. In this case, EPA conducted an inspection on January 9, 2008 to trace the path of the discharge from Outfall 008. Photographs of Outfall 008 to Spencer Lateral show large amounts of foam around the Outfall discharge. The flow from Spencer Lateral, which was composed of 100% effluent, eventually was discharged to Wanity Slough (approximately 0.38 miles away). A photograph of the effluent entering Wanity Slough shows large amounts of foam in the immediate area of the discharge. Additionally, the EPA compliance officer estimated foam on the surface of the Wanity Slough, from the effluent, was visible approximately 100 yards downstream. EPA believes the inspection information is sufficient to conclude that this criterion was violated, and a WQBEL is needed for Outfall 008. The same conclusion can be reached for Outfall 002 since the permittee could easily have discharged the same effluent through Outfall 002 rather than Outfall 008.

III. Temperature

The temperature criterion is 16° C as a 7-day daily average during the non-irrigation season (October 16- March 14) and 18° C as a 7-DADMax will be used during the irrigation season (March 15-October 15) with no single sample daily maximum temperature exceeding 20° C.

The metric for the 7-day daily average criteria is based on the arithmetic average of 7 consecutive measurements of daily maximum temperatures. The data (i.e., 7 day average temperature) needed to evaluate whether the discharge will cause or contribute to an exceedance of the 7-day daily average criterion has not been collected. Therefore, the data will be collected during this permit cycle and evaluated during the next permit cycle to determine if an effluent limitation is needed for the 7-day daily average. Based on a preliminary evaluation of the currently available temperature data from Outfall 002 (March 2003 to March 2008) and Outfall 008 (August 2003 through January 2008) it appears that the time frame where the effluent is most likely to impact the receiving water is from mid-April though the end of September. Therefore, the draft permit requires the facility to gather effluent and receiving water temperatures during this time period. This information will be used during the next permit cycle

to determine if effluent limitations are needed for temperature.

IV. pH

The pH criterion is a range of 6.5 to 8.5 standard units with a human-caused variation within the above range of less than 0.5 standard units. A review of the effluent data from August 2003 through March 2008 shows that the facility did have exceedances of the pH criteria in 2003, 2004 and 2006. Additionally, Section 402(o) of the Clean Water Act (CWA) and federal regulations at 40 CFR 122.44(l) prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit. Section 402(o)(2) of the CWA establishes some exceptions to this prohibition, however, in this case, none of the exceptions apply. Therefore, the pH limitations of 6.5 to 8.5 standard units will be retained in the draft permit.

V. Dissolved Oxygen/5-day Biochemical Oxygen Demand

An effluent may cause a direct violation of the dissolved oxygen criterion near the point of discharge if the effluent is low in dissolved oxygen, and it may cause a violation of the dissolved oxygen criterion downstream of the discharge location.

As stated previously, a stream survey of Wanity Slough was conducted on July 23, 1993 to characterize the receiving water. In-stream vertically averaged concentrations of dissolved oxygen were between 9.09 mg/L and 11.2 mg/L throughout the stream study area[6]. These values are between 102.2% saturation and 119.1% saturation. In the fact sheet for the 1994 permit for this facility, it was postulated that the supersaturated D.O. values were likely due to large populations of rooted aquatic plants, which were found throughout the stream (see page 7 of *Fact Sheet for Draft NPDES Permit No. WA-005020-2, Washington Beef, Inc.*, December 9, 1993). Supersaturation (greater than 100% saturation) can indicate problems such as excessive plant growth. Aquatic plants produce oxygen by photosynthesis during daylight hours but they also use oxygen for respiration. During the night or on heavily overcast days, respiration removes oxygen from the water while photosynthesis stops or drastically slows down. Oxygen depletion of the water can occur, during the night or heavily overcast days, because of heavy plant growth. These wide daily fluctuations of D.O. can be stressful to aquatic organisms. Additionally, dissolved oxygen data was collected by the Yakama Nation Water Resources Planning Program from March 1990 through April 1991. This data was collected upstream of lateral 4, and just downstream of the facility. Dissolved oxygen levels varied from 6.2 mg/L to 11.4 mg/L but did not exhibit an explicit flow period relationship. Based on this data, the steam is not meeting either the Yakama Nation's or Washington's water quality standards. Therefore any discharge of oxygen demanding material, will cause or contribute to a depletion of D.O. in the receiving water and consequently negatively impact aquatic life. When organic matter decomposes, it is fed upon by aerobic bacteria. In this process, organic matter is broken down and oxidized (combined with oxygen). BOD is a commonly used metric for measuring the quantity of organic oxygen-demanding material in water. The technology-based effluent limits

[6] The survey study area extended over a 600 foot section of Wanity Slough; 150 feet upstream through 450 feet downstream of outfall 002 (see *Fact Sheet for Draft NPDES Permit No. WA-005020-2, Washington Beef, Inc.*, December 9, 1993 for a map of the study area).

for this facility allow the facility to discharge BOD up to 65.5 mg/L in a day. Furthermore, the D.O. levels in the effluent can be very low, and have varied from 1.9 mg/L to 9.8 mg/L, with a median value of 5.9 mg/L. Given this information, the facility discharge does have the reasonable potential to cause or contribute to an exceedance of water quality standards, and effluent limitations are needed for BOD and D.O.

APPENDIX D
DEVELOPMENT OF
WATER QUALITY-BASED EFFLUENT LIMITATIONS

The reasonable potential analysis conducted in Appendix C has determined the need to derive water quality-based effluent limits (WQBEL) for several parameters. The following discuss presents how water quality-based effluent limits were developed.

In general, the first step in developing a WQBEL is to develop a wasteload allocation (WLA) for the pollutant. A wasteload allocation is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of water quality standards in the receiving water. In cases where a mixing zone is not authorized, or the receiving water already exceeds the applicable criterion, the WLA is set equal to the criterion. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The water quality-based effluent limits in this permit have been calculated using a mixing zone for Wanity Slough when appropriate. Since the low flow in Spencer Lateral is zero, and the Yakama Nation water quality standards do not allow mixing zones for intermittent streams, no mixing zone is allowed for discharges to Spencer Lateral.

Once a WLA is developed, EPA calculates effluent limits that are protective of the WLA using statistical procedures described in chapter 5 of EPA's *Technical Support Document for Water Quality-based Toxics Control* (March 1991). This type of analysis was done for ammonia and turbidity. A Streeter-Phelps model was used to determine the appropriate limits for BOD and D.O.; and the limits for aesthetics, pH, and bacteria were developed by directly implementing the criterion as the limit. The water quality based limits for oil and grease were retained from the 1994 permit.

Part I of this appendix discusses the development of water quality based effluent limits for aesthetics, pH, bacteria and oil and grease; Part II discusses the development of water quality based effluent limits for ammonia; Part III discusses the development of water quality based effluent limits for turbidity, and Part IV discusses the development of water quality based effluent limits for BOD and dissolved oxygen.

I. Derivation of Aesthetics, pH, Bacteria, and Oil and Grease Effluent Limitations

A. Aesthetics

The water quality standard for aesthetics states: "All waters, including any established mixing zones, shall be free from substances, materials, floating debris, oil, grease, or scum attributable to any point source discharge or nonpoint source activity that: are in amounts sufficient to be visually displeasing, deleterious, a nuisance, or which interfere directly or indirectly with any beneficial use; will settle to form bottom or shoreline deposits which are putrescent, visually displeasing, or otherwise objectionable or will significantly alter the physical, chemical or biological properties of the bottom or shoreline; are in amounts that cause a visible sheen, film, iridescent appearance, or any discoloration of the surface of the water, on any objects in the water, on the adjoining shoreline, or on nearby sediments."

EPA Region 10 generally implements narrative aesthetics criteria directly by including a narrative condition in the proposed permit. The proposed permit contains the following narrative condition: "There must be no discharge of floating solids or visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water."

B. pH

The water quality criteria for pH are expressed as a range between 6.5 – 8.5 standard units. The current permit requires the pH of the discharge to be within the range of 6.5 – 8.5 standard units. Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding). Clean Water Act Section 402(o)(2) does set forth some exceptions to anti-backsliding, however, none of the exceptions apply to this parameter. The limit requiring the effluent discharge to be within the range of 6.5 – 8.5 standard units will be retained in the draft permit.

C. Bacteria

As stated previously, mixing zones are not appropriate for Spencer lateral because the low flow is zero. Additionally, as shown in Table 3 of Appendix C, a mixing zone is not appropriate for *E. coli* in Wanity Slough because there are already high levels of bacteria in the stream. Furthermore, it is EPA's position that mixing zones should not be authorized for bacteria in rivers and streams (see November 12, 2008 memo from Ephraim King on *Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation*). Therefore, the WQBEL for *E. coli* is derived by directly applying the criterion as a monthly geometric mean of 100 colonies/100 ml. An additional condition requires that not more than 10 percent of all samples obtained for calculating the monthly geometric mean value shall exceed 200 colonies/100 ml.

D. Oil and Grease

The 1994 permit contains WQBELs for oil and grease. Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding). Clean Water Act Section 402(o)(2) does set forth some exceptions to anti-backsliding, however, none of the exceptions apply to this parameter. Therefore, an average monthly limit of 10 mg/L and a maximum daily effluent limit of 15 mg/L will be retained in the permit.

The federal regulation at 40 CFR 122.45(f)(1) requires that effluent limits be expressed in terms of mass, if possible. The mass based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[7]

[7] 8.34 is a conversion factor with units (lb × L)/(mg × gallon × 106)

The mass-based limits will be based on the projected maximum effluent flow of 1.6 mgd, and are derived as follows:

Average monthly limit = 10 mg/L X 8.34 X 1.6 mgd = 133.4 lbs/day

Maximum daily limit = 15 mg/L X 8.34 X 1.6 mgd = 200.2 lbs/day

These limits will be applied to both Wanity Slough and Spencer Lateral.

II. Derivation of Ammonia Effluent Limitations

Calculate the Wasteload Allocations (WLAs)

A wasteload allocation is the maximum allowable pollutant concentration that can be discharged in the effluent (after accounting for available dilution, if allowable) without causing an instream water quality exceedance. Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis.

$C_dQ_d = C_eQ_e + C_uQ_u$ where,

C_d = water quality criterion
C_e = WLA
Cu = Maximum measured receiving water upstream concentration (the 95th percentile of the data set is used)
Q_d = Receiving water flow rate downstream of the effluent discharge = Qe + Qu
Q_e = Effluent flow rate (set equal to the highest discharge from facility)
Q_u = Receiving water low flow rate upstream of the discharge = 7.3 mgd for Wanity Slough and 0 mgd for Spencer Lateral

To calculate a wasteload allocation (*i.e.*, C_e), C_d is set equal to the criterion and the equation is solved for C_e. The calculated C_e is the WLA. This procedure is done for both the acute criterion, and the chronic criterion. If mixing zones are allowed, the equation becomes:

$$C_e = WLA = \frac{C_d\,(Q_u \times MZ) + C_dQ_e}{Q_e} - \frac{(C_uQ_u \times MZ)}{Q_e}$$

The calculations for ammonia are as follows:

Ammonia, Outfall 002 (discharge to Wanity Slough)

C_d (acute) = 11 mg/L
C_d (chronic) = 2.6 mg/L
Q_u = 7.3 mgd
C_u = 1.0 mg/L
Qe = 1.6 mgd
Ce = WLA
MZ (acute) = 0
MZ(chronic) = 0.2

$$WLA_{acute} = \frac{11\,(7.3 \text{ X } 0) + (11 \text{ X } 1.6)}{1.6} - \frac{[(1.0\text{X } 7.3) \text{ X } 0]}{1.6} = 11 \text{ mg/L}$$

$$WLA_{chronic} = \frac{2.6\,(7.3 \times 0.20) + (2.6 \times 1.6)}{1.6} - \frac{[(1.0 \times 7.3) \times 0.20]}{1.6} = 4.1 \text{ mg/L}$$

The next step is to compute the "long term average" (LTA) concentrations which will be protective of the WLAs. This is done using the following equations from Section 5.4 of the TSD:

$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\,\sigma)$
$LTA_c = WLA_c \times \exp(0.5\,\sigma_{30}^2 - z\,\sigma_{30})$

where,

$\sigma^2 = \ln(CV^2 + 1)$
$\sigma = (\sigma^2)^{1/2}$

$\sigma_{30}^2 = \ln(CV^2/30 + 1)$
$\sigma_{30} = (\sigma_{30}^2)^{1/2}$

$z = 2.326$ for 99th percentile probability basis

For Ammonia,

$CV = 1.1$[8]

$\sigma^2 = \ln(1.1^2 + 1) = 0.7929$
$\sigma = \sqrt{\sigma^2} = 0.8905$
$\sigma_{30}^2 = \ln(1.1^2/30 + 1) = 0.0395$
$\sigma_{30} = \sqrt{\sigma_4^2} = 0.1989$
$z = 2.326$ for 99th percentile probability basis

Therefore,

$LTA_a = 2.1$ mg/L
$LTA_c = 2.6$ mg/L

The acute and chronic LTAs are compared and the more stringent is used to develop the daily maximum (MDL) and average monthly (AML) permit limits as shown below. The acute LTA of 2.1 µg/L is more stringent.

Derive the maximum daily and average monthly effluent limits

Using the equations in Section 5.4 of the TSD, the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m\,\sigma - 0.5\,\sigma^2)$

[8] Washington Beef upgraded their wastewater treatment system in June 2008; therefore data from June 2, 2008 to July 23, 2009 was used to determine the effluent CV as this date more accurately reflects their current treatment system.

$$AML = LTA \times \exp(z_a \sigma_n - 0.5 \sigma_n^2)$$

where σ, and σ^2 are defined as they are for the LTA equations and,

$\sigma_n^2 = \ln(CV^2/n + 1)$
$\sigma_n = \sqrt{\sigma_n^2}$
z_a = 1.645 for 95th percentile probability basis
z_m = 2.326 for 99th percentile probability basis
n = number of sampling events required per month, however, the value of n should not be less than the averaging period upon which the criterion is based. In this case the chronic ammonia criterion has an averaging period of 30, therefore, 30 will be used.
CV = 1.1

For ammonia,

MDL = 11.2 mg/L
AML = 2.9 mg/L

The associated mass based limits are derived as follows:

MDL = 11.2 X 8.34 X 1.6 = 149.5 lbs/day
AML = 2.6 X 8.34 X 1.6 = 38.7 lbs/day

Ammonia, Outfall 008 (discharge to Spencer Lateral)

A mixing zone is not appropriate for Spencer Lateral. In these cases, the WLA is set equal to the criterion.

WLA_a = 11 mg/l
WLA_c = 2.6 mg/l

The next step is to compute the "long term average" (LTA) concentrations which will be protective of the WLAs. This is done using the following equations from Section 5.4 of the TSD, and CV value of 1.1[9] was used:

$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\sigma)$ = 2.1 mg/l
$LTA_c = WLA_c \times \exp(0.5 \sigma_{30}^2 - z \sigma_{30})$ = 1.7 mg/l

Using the equations in Section 5.4 of the TSD, the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m \sigma - 0.5 \sigma^2)$ = 9.1 mg/l
$AML = LTA \times \exp(z_a \sigma_n - 0.5 \sigma_n^2)$ = 2.3 mg/l

The associated mass based limits are derived as follows:

[9] Washington Beef upgraded their wastewater treatment system in June 2008; therefore data from June 2, 2008 to July 23, 2009 was used because it more accurately reflects their current treatment system.

MDL = 9.1 X 8.34 X 1.6 = 121.4 lbs/day
AML = 2.3 X 8.34 X 1.6 = 30.7 lbs/day

III. Derivation of Turbidity Effluent Limitations

Turbidity, Outfall 002 (discharge to Wanity Slough)

As shown in Table 3 of Appendix C, a mixing zone is not appropriate for turbidity. Therefore, the WLA is set equal to the criterion. In translating the wasteload allocation into permit limits, EPA followed procedures in the TSD. In this case, the first step in developing limits is to determine the time frame over which the WLA applies. In general, the period over which a criterion applies is based on the length of time the target organism can be exposed to the pollutant without having an adverse effect. For example, aquatic life criteria generally apply as one-hour averages (acute criteria) or four-day averages (chronic criteria). In the case of turbidity, the target organisms are aquatic organisms and turbidity may affect them by blanketing the bottom of water bodies which can damage the invertebrate populations, block gravel spawning beds, and if organic, remove dissolved oxygen from overlying waters. The period over which this effect occurs is uncertain. Since turbidity is not a toxic pollutant EPA believes that applying the WLA as monthly averages may be appropriate.

The NPDES regulations at 40 CFR 122.45(d) require that permit limits to be expressed as average monthly limits (AMLs) and maximum daily limits (MDLs) unless impracticable. The WLA must be statistically converted to a maximum daily and average monthly permit limits. In this case, because the averaging period for the pollutant is monthly, no conversion is necessary and the monthly average permit limit is equal to the WLA. Therefore, the AML = 12.4 NTU

The objective in setting effluent limits is to establish limits that will result in the effluent meeting the WLA under normal operating conditions virtually all the time. Developing both an AML and MDL is consistent with the requirements of EPA regulations and ensures good performance of the treatment system. Setting an MDL establishes an upper bound on effluent values used to determine the monthly average and provides a measure of effluent compliance during operational periods between monthly sampling.

The MDL is then derived from the following equation:

$$\frac{MDL}{AML} = \frac{\exp[z_m \sigma - 0.5 \sigma^2]}{\exp[z_a \sigma_n - 0.5 \sigma_n^2]}$$

$\sigma_n^2 = \ln (CV^2/n + 1)$

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

n = number of samples per month =12

Z_m = percentile exceedance probability for the MDL =2.326 for the 95th percentile

Z_a = percentile exceedance probability for the AML = 1.645 for the 99th percentile

CV for Outfall 002 = 2

MDL = 50.3 NTU

AML = 12.4 NTU

Turbidity, Outfall 008 (discharge to Spencer Lateral)

The same analysis was done for outfall 008, and the CV for this outfall is 1.2. The results are:

MDL = 44.2 NTU
AML = 12.4 NTU

IV. Derivation of Dissolved Oxygen/BOD_5 Effluent Limitations

As discussed in Part III.B of the Fact Sheet, EPA is requiring the facility to control BOD and D.O. levels such that the discharge has a non-measureable effect on dissolved oxygen levels in the water. Washington State describes a measureable change in D.O. as a decrease in D.O. of 0.2 mg/L (see WAC 173-201A-320) and EPA will use this definition. A Streeter Phelps model was used to determine the levels of BOD and D.O. needed in the discharge to assure that the facility discharge does not cause a measureable decrease in D.O. The input parameters are described below, and a summary of the Streeter Phelps model follows the summary:

River - Upstream

Width: 23.7 feet (from 1994 stream characterization study by Brown and Caldwell)

Depth: 1.4 feet (from 1994 stream characterization study by Brown and Caldwell)

Flow: 11.3 cfs (from 1994 stream characterization study by Brown and Caldwell)

BOD: 5.00 mg/L (BOD measurements taken from Washington Beef monitoring data in Wanity Slough)

D.O.: 7.9 mg/L (This is an assumed value. Because it is known that the river is impaired for dissolved oxygen and is not meeting either Washington or Yakama Tribal standards, EPA assumed that the river was near the Washington standard of 8.0 mg/L)

River - Downstream

Deoxy. Rate: 0.23 (this value was taken from the analysis completed for the 1994 NPDES permit)

D.O Saturation

Temperature: 20.6 ºC (95^{th} percentile from Wanity Slough monitoring data, 3/18/90 – 9/27/02)

Elevation: 750 feet (from 1994 stream characterization study by Brown and Caldwell)

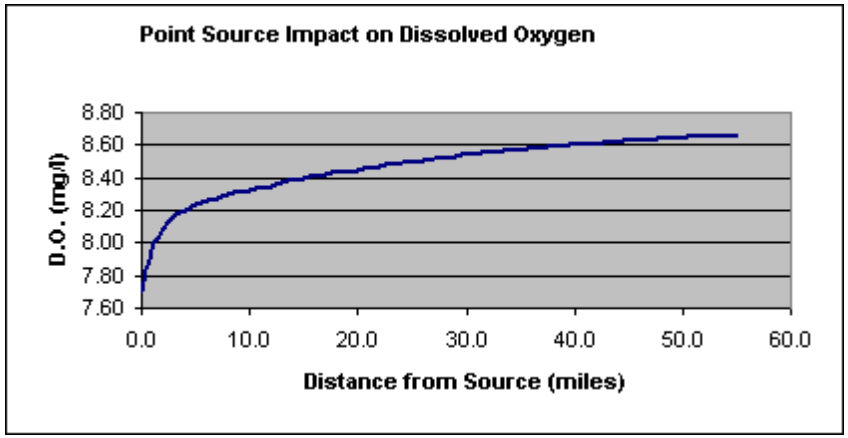
Effluent Discharge

Flow: 2.47 cfs (maximum effluent flow)

Streeter-Phelps Model Results

Input Characteristics of System (User Input in Green Areas)

River - Upstream			DO Saturation		
Width (ft)	23.7		H20 Temp	(deg C)	20.6
Depth (ft)	1.40		Elevation	ft	750
Flow (cfs)	11.30		DOsat		8.75
BOD (mg/l)	5.00				
DO (mg/l)	7.90				
Discharge			**Output Control**		
			Distance Increment (mi)		1
Flow (cfs)	2.47		Distance Increment (ft)		5280.0
BOD (mg/l)	45.00				0
DO (mg/l)	6.80				
River - Downstream					
Q (cfs)	13.77				
Velocity (fps)	0.42				
Reaeration Rate	5.02				
Deoxy. Rate	0.23	at 20 deg C			
Deoxy. Rate	0.24	at H20 Temp (above)			



Model Output X (miles)	time (day)	BODriv	DO Deficit	DO(x)
0.0	0.00	12.18	1.05	7.70
1.0	0.15	11.76	0.79	7.96
2.0	0.29	11.36	0.66	8.09
3.0	0.44	10.97	0.59	8.16
4.0	0.59	10.59	0.55	8.20
5.0	0.74	10.23	0.52	8.23
6.0	0.88	9.88	0.49	8.26

Source for Equations: Chapra, S. 1997. Surface Water Quality Modeling (p.391)

- includes

Streeter-Phelps formulation for BOD/DO

O'Connor-Dobbins reaeration formula

Elson formula for elevation effect on DO saturation

Chapra deoxygenation rate temperature adjustment

Using the above inputs it was found that the effluent did not degrade the receiving water by more than 0.2mg/L provide the maximum daily limit for BOD_5 is 45 mg/L, and dissolved oxygen concentration is 6.8 mg/L. The average monthly limit for BOD_5 will be retained from the 1994 permit (i.e., 30 mg/L). The associated mass based effluent limitations are:

Maximum daily limit = 30 mg/L X 1.6 mgd X 8.34 = 400.3 lbs/day

Average monthly limit = 45 mg/L X 1.6 mgd X 8.34 = 600.5 lbs/day

The above analysis was done using data for Wanity Slough. Since, currently, the flow from Spencer Lateral can leak through to Wanity Slough via a gate, EPA will apply the same water quality-based effluent limits to the discharge when it discharges to Outfall 008 (Spencer Lateral). Additionally, EPA believes it is reasonable to assume that the conditions in Spencer Lateral will be similar to those found in Wanity Slough.

APPENDIX E
ENDANGERED SPECIES ACT

I. Threatened and Endangered Species

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries) and the U.S. Fish and Wildlife Service (USFWS) regarding potential effects an action may have on listed endangered species.

The following federally-listed endangered and threatened species may be located in the vicinity of the discharges. This list was developed from the *Species List* found on the U.S. Fish and Wildlife Services – Species Report at: http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=WA&status=listed. This *Species List* identifies those species under the jurisdiction of USFWS and NOAA-Fisheries.

Endangered Species: None

Threatened Species: Middle Columbia River steelhead (*O. mykiss*)
Bull Trout (*Salvelinus confluentus*)
Ute Ladies'-tresses (*Spiranthes diluvialis*)

II. Potential Effects for Species

EPA has prepared a Biological Assessment for the re-issuance of the Washington Beef permit and determined that the permitted discharges will have **No Effect** on the Bull trout, and Utes' Ladies Tresses, and are **Not Likely to Adversely Affect** the Mid Columbia steelhead. The permit may be modified during its 5-year term if new information on the effects of the discharges on listed species becomes available.

EPA will provide the NOAA-Fisheries with the draft permit and fact sheet and the Biological Evaluation during the public notice period. Any comments received from the agency regarding this determination will be considered prior to issuance of this permit.

APPENDIX F
ESSENTIAL FISH HABITAT ASSESSMENT

An analysis of EFH, in consultation with NOAA Fisheries, is required for any federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities. The objectives of this EFH analysis are to determine whether the EPA action described in sections I and II of the biological assessment would adversely affect designated EFH. For the purpose of this EFH analysis, EPA defines the Action Area as Wanity Slough.

According to the Magnuson-Stevens Fishery Conservation and Management Act (MSA§3), EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth and maturity. For the purpose of interpreting this definition of EFH: "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, and growth to maturity" covers a species' full life cycle (50 CFR 600.01). "Adverse effect" means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g. physical disruption), indirect (e.g. loss of prey), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

This fact sheet and the draft permit will be submitted to NOAA-Fisheries for review during the public notice period. Any recommendations received from NOAA-Fisheries regarding EFH will be considered prior to final reissuance of this permit.

NOAA-Fisheries has requested that EFH assessments contain the following requirements:

1. **Species in the Facility Area.** The October 15, 2008 federal register lists EFH habitat for Chinook and Coho salmon in the Lower Yakima River, and all streams, estuaries, marine waters, and other waterbodies historically accessible to Chinook and Coho in the Lower Yakima (see 73 FR 60991).

2. **Facility Description and Discharge Location**. The facility activities and wastewater sources are described in Part II of this Fact Sheet, and the discharge location is described in Part III.

3. **EFH Evaluation**. The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge for the following reasons:

a. The proposed permit has been developed to protect aquatic life species in Wanity Slough and Spencer Lateral. NPDES permits are established to protect water quality in accordance with water quality standards. The standards are developed to protect the designated uses of the waterbody including growth and propagation of aquatic life and wildlife.

b. The derivation of permit limits and monitoring requirements for an NPDES discharge include the basic elements of ecological risk analysis as specified in the Technical Support Document (TSD) (EPA, 1991). This analysis includes, but is not limited to, the following: effluent characterization, threshold concentration determination, exposure considerations, dilution modeling and analysis, multiple sources and natural background consideration, fate and transport variability, and monitoring duration and frequency.