FACT SHEET

The United States Environmental Protection Agency (EPA), Region 10
Proposes to Reissue A
National Pollutant Discharge Elimination System (NPDES) permit to:

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

Permit Permit Number: WA-005020-2
Original Public Notice Issuance Date: April 28, 2004
Original Public Notice Expiration Date: May 28, 2004

Extended Public Notice Expiration Date: June 28, 2004

EPA Proposes NPDES Permit Reissuance.
EPA proposes to reissue an NPDES permit to the Washington Beef, Inc. (hereafter referred to as Washington Beef) in Toppenish, Washington. 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.

This Fact Sheet includes:
- information on public comment, public hearing and appeal procedures,
- a description of the discharge,
- a listing of proposed effluent limitations and other conditions,
- a listing of proposed receiving water monitoring requirements;
- a map and description of the discharge location and
- detailed technical material supporting the conditions in the permit.

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

After the Public Notice expires and all comments have been considered, EPA's regional Director for the Office of Water 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 permit. The permit will become effective 30 days after the issuance date unless a request for an evidentiary hearing is submitted within 30 days.

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

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

The Fact Sheet and draft permit are also available at:

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

Yakama Indian Nation
Department of Natural Resources
Environmental Management Program
P.O. Box 151
Toppenish, Washington 98948
(509) 865-5121

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Washington Beef, Inc.
NPDES Permit Number: WA-005020-2
Facility Contact: Gary Hyatt, Processing Division Manager

Facility Mailing Address:	Facility Location:
P.O. Box 832	201 Elmwood Road
Toppenish, Washington 98948	Toppenish, Washington 98948

II. FACILITY INFORMATION

A. Facility Description

Washington Beef, Inc. owns, operates, and has maintenance responsibility for a complex slaughterhouse facility (Standard Industrial Code "SIC" 2011) located on the Yakima Indian Reservation in Yakima County, Washington. The permit application (dated September 24, 2002) indicates that the facility processes approximately 1,250,000 pounds live weight kill (LWK) which is defined as the total weight of the maximum number of animals slaughtered during any single day (see federal regulations 40 CFR Part 432 Subpart B - Complex Slaughterhouse Subcategory). The facility includes a live animal holding area and beef cattle slaughter house with associated facilities for rendering, meat processing, hide brining and boxing meat warehousing and shipping. A process flow diagram is included in Appendix A and a map showing the location of Washington Beef, Inc. facility is included in Appendix B.

B. Permit History

The Washington Beef, Inc. - Toppenish facility is a new source as defined under federal regulations 40 CFR §122.2 and 122.29. Consequently, any new facility that proposes to discharge pollutants to waters of the United States must apply for an NPDES permit. EPA issued an NPDES permit in 1994 which expired on March 31, 1999. Prior to permit expiration, Washington Beef submitted a permit renewal application (dated September 29, 1998) and the 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 that the agency was in the process of drafting a new permit and requested an updated permit application and all monitoring data for the effluent and receiving water to ensure the new permit accurately reflects conditions at the facility. On September 30, 2002, EPA received a revised NPDES permit application for the facility along with monitoring data for the effluent from outfalls #001 and 002 and the receiving water (*i.e.* Wanity Slough).

C. Plant Performance History

Information from the monitoring results and the permit application were used in determining applicable effluent limitations for the facility (see Section IV below).

The following table summarizes the plant performance based on a review of the monitoring results from January 1995 to August 2002.

SUMMARY OF PLANT PERFORMANCE (Outfall 002)		
Parameter	**Units**	**Plant Performance**
Flow	mgd	0.123 - 0.927
Biochemical Oxygen Demand (BOD_5)	mg/l	5 - 333
Total Suspended Solids (TSS)	mg/l	2 - 1,190
Fecal Coliform Bacteria	colonies/100 ml	2 - 49,000
pH	s.u.	6.53 - 8.42
Temperature	°C	35.3 - 77.0
Total Ammonia	mg/l	0 - 48.5

III. RECEIVING WATER

A. Outfall Location and Description

Effluent from Washington Beef, Inc. facility is discharged into Wanity Slough from five outfalls as specified below:

Outfall	Latitude	Longitude	Description	Projected Flow
001	N 46° 22' 27"	W 120° 19' 15"	non-contact cooling water	0.02 mgd
002	N 46° 22' 21"	W 120° 19' 15"	process wastewater	0.90 mgd
005	N 46° 22' 26"	W 120° 19' 15"	drinking trough overflow	0.0002 mgd
006	N 46° 22' 26"	W 120° 19' 15"	drinking trough overflow	0.0002 mgd
007	N 46° 22' 26"	W 120° 19' 15"	drinking trough overflow	0.0002 mgd

Flow from the Yakima River is diverted into the Wanity Slough near Parker, Washington (approximately 10 miles north of Toppenish, Washington) and continues south, entering the Marion Drain and then the Yakima River just south of Granger, Washington. See Appendix B for the locations of the discharge and receiving waters.

B. Water Quality Standards

Federal regulations 40 CFR 122.44(d)(1)(vii) specify that when developing water quality based effluent limits, the permitting authority shall ensure that the level of water quality to be achieved by limits on point sources established under this paragraph is derived from and complies with all applicable water quality standards. In addition, Section 301(b) of the Clean Water Act requires NPDES permits to include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." Therefore, in the absence of water quality standards established by EPA and the Yakama Indian Nation for Wanity Slough, the *Water Quality Standards for Surface Waters of the State of Washington* were used in the development of the effluent limitations. A State's water quality standards consist of use classifications and numeric and/or narrative water quality criteria. The use classification system designates the beneficial uses (such as cold water biota, salmonid spawning, contact recreation, etc.) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary, by the State, to protect the beneficial use classification of each water body. The State's antidegradation policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality meets the standard. The antidegradation policy is summarized in Appendix F.

The *Water Quality Standards for Surface Waters of the State of Washington* (Washington Administrative Code [WAC] 173-201A-120) (1997) specifies that unless classified under WAC 173-201A-130 or 173-201A-140, all unclassified surface waters are considered Class A unless they are tributaries to Class AA waters. Washington water quality standards (WAC 173-201A-130-141) classify the Yakima River from the mouth to Cle Elum River (river mile 185.6) as Class A. Therefore, Wanity Slough would be considered a Class A stream under WAC 173-201A-120.

Washington water quality standards (WAC 173-201A-120) specify the following beneficial uses for Class A surface waters: water supply (domestic, industrial, agriculture); stock watering; fish and shellfish including salmonid migration, rearing, spawning and harvesting; wildlife habitat; recreation (primary contact, sport fishing, boating and aesthetic enjoyment) and commerce and navigation. Appendix C of this fact sheet discusses Washington water quality standards (WAC 173-201A) in more detail and conditions proposed in the draft permit.

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. 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 basis for the proposed effluent limits in the draft permit are provided in Appendix C**.**

B. Proposed Effluent Limitations

Tables 1 and 2 and the following list summarize the proposed effluent limitations in the draft permit. For comparison purposes, the table also includes the effluent limitations of the current permit.

Table 1: Proposed and Current Effluent Limitations for Outfall 001

Parameter	**Units**	**Average Monthly**		**Maximum Daily**		**Minimum Daily**	
		Proposed	**Current**	**Proposed**	**Current**	**Proposed**	**Current**
Outfall Flow	mgd	--	0.99	--	0.99	--	--
pH	s.u.	--	--	8.5	--	6.5	--
Temperature	˚C	--	--	18	18	--	--

Table 2: Proposed and Current Effluent Limitations for Outfall 002

Parameter	**Units**	**Average Monthly**		**Maximum Daily**		**Minimum Daily**	
		Proposed	**Current**	**Proposed**	**Current**	**Proposed**	**Current**
Outfall Flow	mgd	--	0.815	--	0.95	--	--
Biochemical Oxygen Demand (BOD_5)	mg/L	25.6	30	70	45	--	--
	lbs/day	167 [1]	204.0	456 [1]	356.8	--	--
Total Suspended Solids (TSS)	mg/L	25.8	30	78	45	--	--
	lbs/day	168 [1]	204.0	508 [1]	356.8	--	--
Oil and Grease	mg/L	10	10	15	15	--	--
	lbs/day	65 [1]	68.0	98 [1]	118.9	--	--
Fecal Coliform Bacteria [2]	# / 100 ml	100	100	400 [3]	--	--	--
pH	s.u.	--	--	8.5	8.5	6.5	6.5
Temperature	˚C	--	--	18	18	--	--
Dissolved Oxygen	mg/L	--	--	--	--	--	--
Total Ammonia as N [4]	mg/L	0.6	3.4	2.1	8.2	--	--
	lbs/day	4.0 [1]	23.1	13.8 [1]	65.0	--	--

[1] Effluent limits based on a 95th percentile daily flow of 780,932 gallons per day.
[2] No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.
[3] Any single sample shall not exceed this limit.
[4] Reporting is required within 24-hours if the maximum daily limit is violated.

In addition to the requirements listed 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 toxic pollutants, radioactive or deleterious materials in concentrations which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health (Section 101(a)(3) of the Clean Water Act and WAC 173-201A-30(2)(c)(vii)).

3. There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water (WAC 173-201A-30(2)(c)(viii)).

V. MONITORING REQUIREMENTS

A. Basis for Effluent and Receiving Water Monitoring Requirements

Section 308 of the Clean Water Act and federal regulation 40 CFR §122.44(i) requires that monitoring be included in permits to determine compliance with effluent limitations. Additionally, monitoring may be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. 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. Table 3 presents the effluent monitoring requirements in the draft permit.

Table 3: Proposed Monitoring Requirements for Outfalls 001, 002, 005, 006 and 007

Parameter	Units	Sample Frequency				
		Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007
Outfall Flow	gpd	weekly	daily	weekly	weekly	weekly
Biochemical Oxygen Demand (BOD_5)	mg/L	monthly	weekly	quarterly	quarterly	quarterly
Total Suspended Solids (TSS)	mg/L	monthly	weekly	quarterly	quarterly	quarterly
Oil and Grease	mg/L	---	weekly	---	---	---
Fecal Coliform Bacteria	# / 100 ml	---	weekly	quarterly	quarterly	quarterly
pH	s.u.	weekly	daily	quarterly	quarterly	quarterly

Table 3: Proposed Monitoring Requirements for Outfalls 001, 002, 005, 006 and 007						
Parameter	Units	Sample Frequency				
		Outfall 001	Outfall 002	Outfall 005	Outfall 006	Outfall 007
Temperature	˚C	weekly	daily	quarterly	quarterly	quarterly
Dissolved Oxygen	mg/L	monthly	weekly	quarterly	quarterly	quarterly
Total Ammonia as N	mg/L	monthly	weekly	quarterly	quarterly	quarterly
Turbidity	NTU	monthly	weekly	quarterly	quarterly	quarterly
Whole Effluent Toxicity (WET) - Chronic	TU_c	---	semi-annual	---	---	---

C. Proposed Receiving Water Monitoring Requirements

The purpose of receiving water monitoring is to determine water quality conditions as part of the effort to evaluate the reasonable potential for the discharge to cause the receiving waters to not meet state/tribal water quality criteria (40 CFR 122.44). Table 4 summarizes the receiving water monitoring requirements proposed in the draft permit.

Table 4 : Receiving Water (Wanity Slough) Monitoring Requirements			
Parameter	Units	Sample Frequency	Sample Type
Flow	cfs	monthly	recording
Biochemical Oxygen Demand (BOD_5)	mg/L	monthly	grab
Dissolved Oxygen (DO)	mg/L	monthly	grab
Total Suspended Solids (TSS)	mg/L	monthly	grab
Turbidity	NTU	monthly	grab
Total Ammonia as N	mg/L	monthly	grab
pH	s.u.	monthly	grab
Temperature	˚C	monthly	grab

VI. SPECIAL CONDITIONS

A. Quality Assurance Plan (QAP)

The federal regulation 40 CFR §122.41(e) requires the permittee to ensure adequate laboratory controls and appropriate quality assurance procedures in order to properly

operate and maintain all facilities which it uses. Therefore, the draft permit requires the permittee to develop a QAP that will: (1) assist in planning for the collection and analysis of samples in support of the permit, (2) ensure that the monitoring data submitted is accurate and (3) explain data anomalies if they occur. The QAP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The permittee is required within 60 days of the effective date of the draft permit to implement the QAP and notify EPA. The QAP must be retained on site at all times and made available to the Director or his/her representative upon request.

EPA recommends the following references when developing an adequate QAP:

- Requirements for Quality Assurance Project Plans, EPA QA/R-5.
- Guidance for Preparation of Quality Assurance Project Plans, EPA, Region 10, Quality and Data Management Program, QA/G-5
- You and Quality Assurance in Region 10, EPA, Region 10, Quality and Data Management Program, March 1988.
- The Volunteer Monitors Guide to Quality Assurance Project Plans, EPA 841-B-96-003, September 1996.
- Internet site: http:\\www.epa.gov\r10earth\offices\oea\qaindex.htm.

B. Best Management Practices (BMPs)

Section 402 of the Clean Water Act and federal regulation 40 CFR Part 122.44(k) authorize EPA to require best management practices (BMPs) in NPDES permits. 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 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 operating 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.

The permit also includes specific BMPs for the discharge from Outfalls 005, 006 and 007. The wastewater discharged from Outfalls 005, 006 and 007 consist of the overflow from the drinking water troughs located in the holding pens. The discharges are located within 180 meters of Outfall 001 (see Appendix B), therefore to ensure that the

cumulative impact of these discharges does not cause or contribute to a water quality violation, the draft permit proposes effluent monitoring for these outfalls and the following best management practices (BMPs):

> "Wastewater discharged from Outfalls 005, 006 and 007 shall not come in contact with any raw materials, products or byproducts including, but not limited to, manure, litter, bedding or other material associated with the holding pens prior to discharge."

C. Whole Effluent Toxicity (WET) Testing

The Washington water quality standards (WAC 173-201A-040) and Section 101(a)(3) of the Clean Water Act require surface waters of the state to be free from toxic substances in concentrations that impair designated beneficial uses. In addition, federal regulations at 40 CFR §122.44(d)(1) require whole effluent data and criteria when characterizing effluents. The WET approach incorporates laboratory tests that use small 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*). The following table summarizes the test results:

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, Inc.'s discharge in accordance with the Agency's policy for controlling the discharge of toxic substances. The draft permit proposes a narrative standard that the facility shall not discharge chemicals or toxic pollutants in

toxic amounts. In addition, based on the previous test results and recommendations in the *Technical Support Document for Water Quality-based Toxics Control* (TSD) (EPA, 1991) which specify a minimum of ten samples in order to quantify effluent variability and determine reasonable potential analysis, the draft permit includes a semi-annual monitoring frequency for chronic toxicity using the most sensitive species, *Ceriodaphnia dubia*, in order to assist with future efforts to evaluate the reasonable potential for the discharge to cause or contribute to the receiving waters not meeting applicable state/tribal water quality criteria.

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 Marine Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that the issuance of this permit will not affect any of the threatened or endangered species in the vicinity of the discharge (see Appendix D for further details).

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. 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 NMFS for review during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to final reissuance of this permit. See Appendix E for further details.

C. Water Quality Standards Certification

Since the discharge is from a facility located within the boundaries of the Yakama Indian Reservation, the provisions of Section 401 of the Clean Water Act requiring state certification of the permit do not apply.

D. Interstate Waters

Under 40 CFR §124.10 (c)(1)(iii), EPA must give notice of this permit action to any affected state. Notice has been given to Washington Department of Ecology and other Washington state agencies (as defined in this regulation) potentially impacted by this

action. A copy of the proposed permit action has also been provided to the Yakama Indian Tribe, Bureau of Indian Affairs, and Bureau of Land Management.

E. Standard Permit Provisions

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

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.* 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.

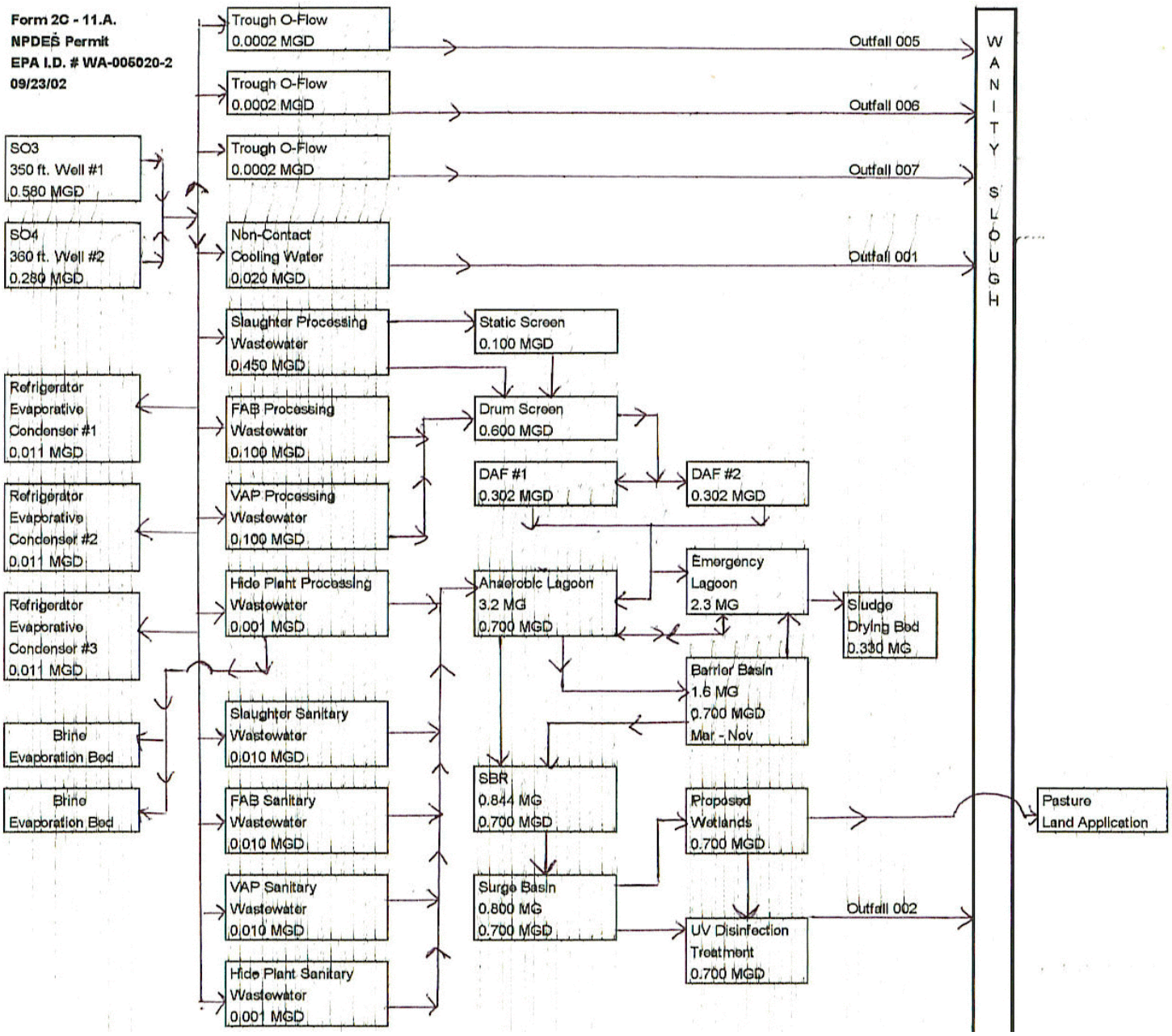
IX. ACRONYMS

BMPs	Best management practices
BOD	Biochemical oxygen demand
BOD_5	Biochemical oxygen demand, five-day
°C	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
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WQBEL	Water quality-based effluent limit

APPENDIX A

PROCESS DIAGRAM


Form 2C - 11.A.
NPDES Permit
EPA I.D. # WA-005020-2
09/23/02
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Outfall 005
Trough O-Flow
0.0002 MGD
Outfall 006
Trough O-Flow
0.0002 MGD
Outfall 007
SO3
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0.580 MGD
SO4
360 ft. Well #2
0.280 MGD
Non-Contact
Cooling Water
0.020 MGD
Outfall 001
WANITY SLOUGH
Slaughter Processing
Wastewater
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Refrigerator
Evaporative
Condenser #1
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FAB Processing
Wastewater
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Drum Screen
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Evaporative
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Emergency
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Hide Plant Processing
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0.700 MGD
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Wastewater
0.010 MGD
Brine
Evaporation Bed
SBR
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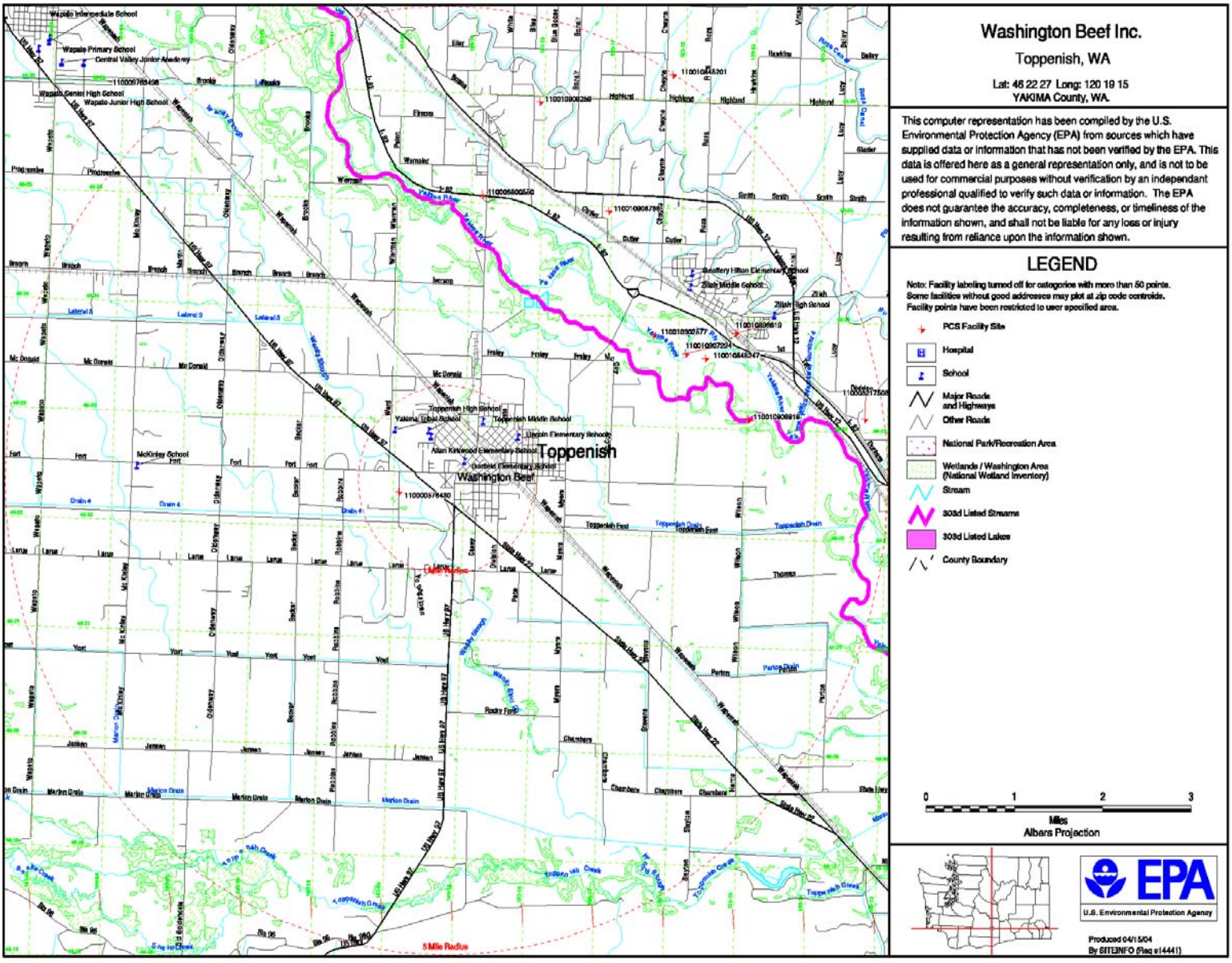
0.700 MGD
Brine
Evaporation Bed
FAB Sanitary
Wastewater
0.010 MGD
Proposed
Wetlands
0.700 MGD
Pasture
Land Application
VAP Sanitary
Wastewater
0.010 MGD
Surge Basin
0.800 MG
0.700 MGD
Outfall 002
UV Disinfection
Treatment
0.700 MGD
Hide Plant Sanitary
Wastewater
0.001 MGD

APPENDIX B

MAP


Washington Beef Inc.
Toppenish, WA
Lat: 46 22 27 Long: 120 19 15
YAKIMA County, WA.
This computer representation has been compiled by the U.S. Environmental Protection Agency (EPA) from sources which have supplied data or information that has not been verified by the EPA. This data is offered here as a general representation only, and is not to be used for commercial purposes without verification by an independant professional qualified to verify such data or information. The EPA does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any loss or injury resulting from reliance upon the information shown.
LEGEND
Note: Facility labeling turned off for categories with more than 50 points. Some facilities without good addresses may plot at zip code centroids. Facility points have been restricted to user specified area.
PCS Facility Site
Hospital
School
Major Roads and Highways
Other Roads
National Park/Recreation Area
Wetlands / Washington Area (National Wetland Inventory)
Stream
303d Listed Streams
303d Listed Lakes
County Boundary
Toppenish
Washington Beef
5 Mile Radius
0 1 2 3
Miles
Albers Projection
EPA
U.S. Environmental Protection Agency
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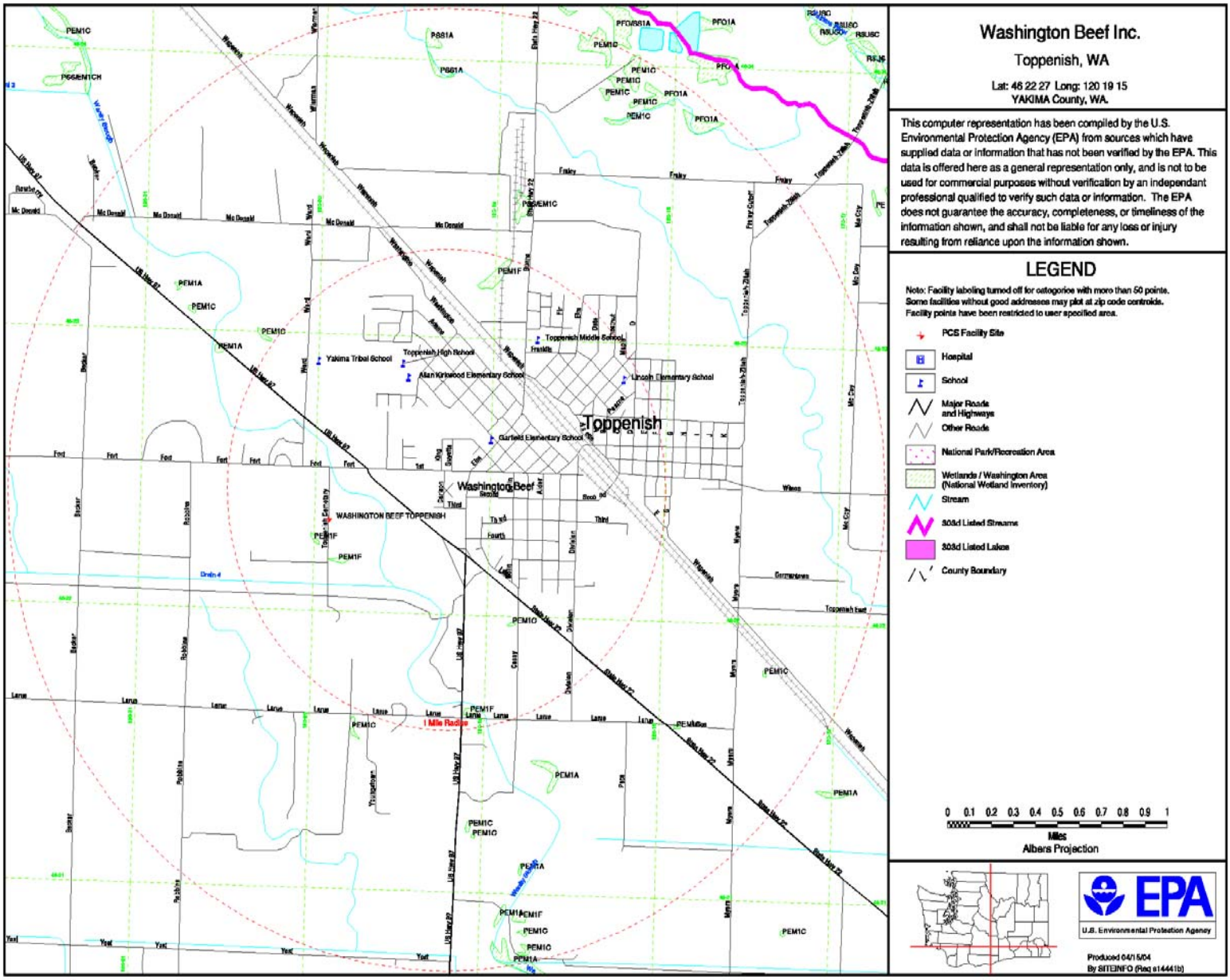
By SITEINFO (Req #1441)


Washington Beef Inc.
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Lat: 46 22 27 Long: 120 19 15
YAKIMA County, WA.
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LEGEND
Note: Facility labeling turned off for categories with more than 50 points. Some facilities without good addresses may plot at zip code centroids. Facility points have been restricted to user specified area.
PCS Facility Site
Hospital
School
Major Roads and Highways
Other Roads
National Park/Recreation Area
Wetlands / Washington Area (National Wetland Inventory)
Stream
303d Listed Streams
303d Listed Lakes
County Boundary
Toppenish
Washington Beef
WASHINGTON BEEF TOPPENISH
1 Mile Radius
Yakima Tribal School
Toppenish High School
Toppenish Middle School
Alan Kirkwood Elementary School
Lincoln Elementary School
Garfield Elementary School
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
Miles
Albers Projection
EPA
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APPENDIX C

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 basis for the effluent limitations and other conditions in the draft permit. EPA evaluates discharges with respect to these sections of the Clean Water Act and the relevant NPDES regulations in determining which conditions to include in the permit.

II. Technology-Based Limits

In general, EPA first determines which technology-based limits are required to be incorporated into the permit [40 CFR §122.44(a)] as well as best management practices and other applicable requirements. Washington Beef, Inc. is an industrial discharger for which technology-based effluent limitations are based on two general approaches: (1) using national effluent limitations guidelines (ELGs) or (2) using Best Professional Judgement (BPJ) on a case-by-case basis in the absence of ELGs. National ELGs have been promulgated for discharges from slaughterhouse facilities (40 CFR Part 432). Federal regulations 40 CFR 432.25 and 432.26 (Subpart B - Complex Slaughterhouse Subcategory) are applicable to discharges resulting from the production of red meat carcasses, in whole or part, by complex slaughterhouses like Washington Beef and specify standards of performance for BOD_5, TSS, oil and grease, total ammonia, pH and fecal coliform bacteria. Daily and monthly average limits are specified for BOD_5, TSS, oil and grease and total ammonia based on live weight killed (LWK) which is the total weight of the total number of animals slaughtered during the specified time period (e.g. pounds per day, pounds per month,...). In addition, federal regulations 40 CFR §122.45(f) require that NPDES permits must also express the effluent limits in terms of mass-based limits. Therefore, mass-loading limits were determined based on the plant design capacity of 1,250,000 pounds LWK per day and calculated as shown below.

A. Calculations

1. Biological Oxygen Demand (BOD_5)

Monthly Average Loading
= (1,250,000 lbs LWK / day) x (0.21 lbs/1000 lbs LWK) = 262.5 lbs/day

Maximum Daily Loading
= (1,250,000 lbs LWK / day) x (0.42 lbs/1000 lbs LWK) = 525.0 lbs/day

Monthly Average Concentration
= (262.5 lbs/day)/[(8.34 x 10^{-6}) x (780,932 gallons/day)] = 40.3 mg/l

Maximum Daily Concentration
= [(525.0 lbs/day)/(8.34 x 10^{-6})] x (780,932 gallons/day) = 80.6 mg/l

2. Total Suspended Solids (TSS)

   Monthly Average Loading
   = (1,250,000 lbs LWK / day) x (0.25 lbs/1000 lbs LWK) = 312.5 lbs/day

   Maximum Daily Loading
   = (1,250,000 lbs LWK / day) x (0.50 lbs/1000 lbs LWK) = 625.0 lbs/day

   Monthly Average Concentration
   = (312.5 lbs/day)/[(8.34 x 10^{-6}) x (780,932 gallons/day)] = 48.0 mg/l

   Maximum Daily Concentration
   = [(625.0 lbs/day)/(8.34 x 10^{-6})] x (780,932 gallons/day) = 96.0 mg/l

3. Oil and Grease

   Monthly Average Loading
   = (1,250,000 lbs LWK / day) x (0.08 lbs/1000 lbs LWK) = 100.0 lbs/day

   Maximum Daily Loading
   = (1,250,000 lbs LWK / day) x (0.16 lbs/1000 lbs LWK) = 200.0 lbs/day

   Monthly Average Concentration
   = (100.0 lbs/day)/[(8.34 x 10^{-6}) x (780,932 gallons/day)] = 15.4 mg/l

   Maximum Daily Concentration
   = [(200.0 lbs/day)/(8.34 x 10^{-6})] x (780,932 gallons/day) = 30.7 mg/l

4. Total Ammonia

   Monthly Average Loading
   = (1,250,000 lbs LWK / day) x (0.24 lbs/1000 lbs LWK) = 300.0 lbs/day

   Maximum Daily Loading
   = (1,250,000 lbs LWK / day) x (0.48 lbs/1000 lbs LWK) = 600.0 lbs/day

   Monthly Average Concentration
   = (300.0 lbs/day)/[(8.34 x 10^{-6}) x (780,932 gallons/day)] = 46.1 mg/L NH_3-N

   Maximum Daily Concentration
   = [(600.0 lbs/day)/(8.34 x 10^{-6})] x (780,932 gallons/day) = 92.1 mg/L NH_3-N

5. Hydrogen ion concentration (pH)

Federal technology-based requirements specify a pH range of 6.0 to 9.0 standard units (s.u.).

6. Fecal Coliform Bacteria

Federal technology-based requirements specify a maximum value of 400 colonies/100 ml at any time.

III. Water Quality-Based Limits

In addition to the technology-based limits, Section 301(b) of the Clean Water Act requires that NPDES permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met (see Section III.B. above). Therefore, the effluent limitations specified in an NPDES permit are developed from both technology available to treat the pollutants ("technology-based limits") and limits that are protective of the designated uses of the receiving water ("water quality-based limits"). For a pollutant for which both technology-based and water quality-based limits exist, the more stringent limits will be included in the permit.

In determining whether water quality-based limits are needed and developing those limits when necessary, EPA uses the approach outlined below:

1. Determine the appropriate water quality criteria
2. Determine whether there is "reasonable potential" to exceed the criteria
3. If there is "reasonable potential", then develop a wasteload allocation (WLA)
4. Develop effluent limitations based on WLAs
5. Compare to technology-based limits and apply the more stringent limits

A. Calculations

This section describes the process of how water quality-based effluent limits (WQBELs) were calculated. The calculations were performed according to procedures outlined in Chapter 5 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD) (EPA, 1991).

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

   a. Determine the appropriate water quality criterium

      State water quality standards specify numeric criterium for dissolved oxygen concentrations in the receiving water (WAC 173-201A-030(2)(c)(ii)). For

freshwater, dissolved oxygen shall exceed 8.0 mg/l. BOD concentrations in the effluent can affect the dissolved oxygen concentrations in the receiving water.

b. Determine acceptable effluent limits based on criterium

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) refer to "anti-backsliding" that 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. In limited cases, Section 402(o)(2) does allow for relaxation of effluent limits including situations where there has been material and substantial alternations or additions to the permitted facility which justify higher effluent limits. The previous effluent limits for BOD were water quality-based to ensure that the discharge did not cause or contribute to a water quality violation. Based on the current effluent and receiving water monitoring data, a reasonable potential analysis was conducted using the Streeter-Phelps equation to determine effluent limits for BOD that ensure DO criteria would not be exceeded.

Streeter-Phelps equation :

$$D = (K_1 \times L)/(K_2-K_1)\times(e^{(-K_1 \times t)}-e^{(-K_2 \times t)}) + D_o \times e^{(-K_2 \times t)} + (S+R-P)/K_2 \times (1-e^{(-K_2 \times t)})$$

where:

D = dissolved oxygen deficit at point x
K_1 = first order reaction rate constant
L = ultimate BOD at point x
K_2 = reaeration constant
$K_2 = (D_L \times U)^{0.5} / H^{1.5}$, where D_L is the diffusivity of oxygen in water, U is stream velocity (ft/hr) and H is stream depth (ft)
e = natural logarithm, base e
t = time when the effluent reaches point x
D_o = initial oxygen deficit at x=0
S = sediment oxygen demand
R = oxygen demand due to algal respiration
P = reaeration due to photosynthesis

L can be calculated from the 5-day BOD as:

$L = y_5 / (1-e^{(-5 \times K1)})$
where y_5 = 5-day BOD

The following table summarizes the input data and modeling results:

Parameter	Value	Description

K_1 (day^{-1})	0.30 [1]	
K_2 (day^{-1})	4.56	
D_L (ft^2/hr)	0.000081	
U (ft/hr)	1224 [2]	
H (ft)	1.4 [2]	
S	0	
R	0	
P	0	
Effluent BOD_5 (mg/l)	70	Proposed weekly average effluent limit
Rcv Wtr BOD_5 (mg/l)	5.00	95th percentile of receiving water data
Effluent Temp (°C)	22.26	95th percentile of receiving water data
Rcv Wtr Temp (°C)	20.56	95th percentile of receiving water data
Effluent Flow (cfs)	1.21	95th percentile of data (ie. 780,932 gallons per day)
Rcv Wtr Flow (cfs)	11.30 [2]	projected minimum flow
Effluent DO (mg/l)	0	
Rcv Wtr DO (mg/l)	10.90 [3]	5th percentile of receiving water data

---

Effluent L = 90.11

Calculate the temperature, dissolved oxygen, BOD, and L of the mix in the receiving water

T = 20.72
DO = 9.85
BOD = 11.28
L = 14.52

Input the saturation dissolved oxygen concentration (DO_S) at T mix

---

[1] Metcalf & Eddy, 1991

[2] Brown and Caldwell, 1993

[3] Yakima Indian Nation Water Resources Planning Program, 1991

$DO_S = 14.65 - 0.41022T + 0.00791T^2 - 0.00007774T^3$ (assume salinity is negligible)
where T is the temperature of the mix in °C

DO_S at 0 ft = 8.85

DO_S at 300 feet elevation = $DO_S \times (1 - 0.027 \times E/760)$
where E is the elevation in feet

DO_S at 300 ft = 8.76

Calculate D_o

D_o = -0.37

Correct K_1, K_2 to the temperature of the mix

K_1 = 0.31
K_2 = 4.72

T_{max} = time to reach minimum DO, in days, is calculated by:

$$T_{max} = \frac{\ln [(K_2/K_1) \times \{1- (D_o \times (K_2-K_1)/(K_1 \times L))\}]}{(K_2-K_1)} = 0.78 \text{ days}$$

D_{max} = maximum DO sag, in mg/l, calculated by:

$D_{max} = (K_1/K_2) \times L \times e^{(-K_1 \times Tmax)} = 0.75$ mg/l

X_{max} = location of maximum DO sag, in miles, calculated by:

$X_{max} = T_{max} \times U \times 0.00455$

Where 0.00455 is the conversion from ft/hr to miles/day

X_{max} = 4.35 miles

The following table summarizes the dissolved oxygen (DO) sag and concentration in the Wanity Slough downstream of Outfall 002:

Distance (X)	Time (t)	DO sag	DO concentration
miles	days	mg/l	mg/l

1	0.18	0.06	8.70
2	0.36	0.53	8.23
3	0.54	0.70	8.06
4	0.72	0.75	8.01
5	0.90	0.74	8.02
6	1.08	0.72	8.04
7	1.26	0.69	8.07
8	1.44	0.65	8.11
9	1.62	0.62	8.14
10	1.80	0.58	8.18

Based on the modeling results, the draft permit proposes the following effluent concentration-based and mass-loading limits for BOD:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Biochemical Oxygen Demand (BOD_5)	mg/L	25.6	70
	lbs/day	167	456

Based on the effluent monitoring data from January 2000 to August 2002, the Washington Beef facility would not be able to meet the proposed monthly average limits approximately 12.5% of the time. State water quality standards (WAC 173-201A-160(4)) indicate that discharge permits for point sources may incorporate schedules for achieving compliance with water quality criteria. Federal requirements for schedules of compliance are specified under 40 CFR §122.47 and include submittal of annual progress reports to EPA. The draft permit proposes the following milestones in regards to the annual reports.

Schedule of Compliance for Biochemical Oxygen Demand		
Task No.	Due at End of Year	Task Activity
1	1	Source investigation. The permittee must investigate the sources, extent, transport, and fate of BOD in outfall 002. Deliverable: The permittee must prepare a progress report of findings, and recommendations for further actions to reduce BOD.

Schedule of Compliance for Biochemical Oxygen Demand		
Task No.	Due at End of Year	Task Activity
2	2	Feasibility study. The permittee must investigate the feasibility of measures to reduce BOD in outfall 002 to meet the effluent limits. Evaluations should consider short- and long-term aspects of: (1) effectiveness of the measures (e.g. affords long-term protection, minimizes short term environmental impacts, and complies with effluent limits); and (2) implementability of the measures (e.g., technical feasibility). Readily implementable measures must be designed and constructed as soon as feasible. Measures that are more technically difficult or have more unknowns may need further investigations. Deliverable: The permittee must submit: (1) A report of the findings on the feasibility of measures; and (2) Design documents and/or construction completion reports for those measures that are readily implemented.
3[1]	3	Design and construction. The permittee must complete construction and operate measures such that effluent limits for BOD in outfall 002 are achieved. Deliverable: The permittee must submit construction completion reports.
[1] Tasks scheduled past Year 2 are listed in anticipation of potential unknown conditions. The permittee does not need to complete these later tasks if compliance with the effluent limits is achieved sooner.		

State water quality standards (WAC 173-201A-160(4)(b)) specify that interim effluent limits shall be established for the period of time during which compliance with water quality criteria is deferred. Therefore, the draft permit includes the current effluent limits for BOD as interim limits during this period of time.

2. Total Suspended Solids (TSS) and Turbidity

   a. Determine the appropriate water quality criterium

      State water quality standards (WAC 201(A)030(2)(c)(vi)) specify that the receiving water shall not exceed 5 Nephelometric Turbidity Units (NTU) above background when background concentrations are $\leq$ 50 NTU. Monitoring data for the receiving water indicated an average background concentration of 5.65 NTU. Therefore, a numeric criterium of 10.65 NTU was calculated at the edge of the mixing zone for outfall 002.

   b. Determine acceptable effluent limits based on criterium

      Similar to the current effluent BOD limits, the limits for TSS were water quality-based to ensure that the discharge did not cause or contribute to a water quality violation. However, the water quality criterium was incorrectly incorporated in the previous permit by specifying a numeric criterium of 50 NTU. In accordance with the "anti-backsliding" prohibitions specified in Section 402(o) of the Clean

Water Act and 40 CFR §122.44 (l), new effluent limits for TSS were developed using the following approach:

i. A wasteload allocation (WLA) of 59.6 NTU at the end-of-pipe was calculated using the following equation:

$WLA = C_R \times D_f$

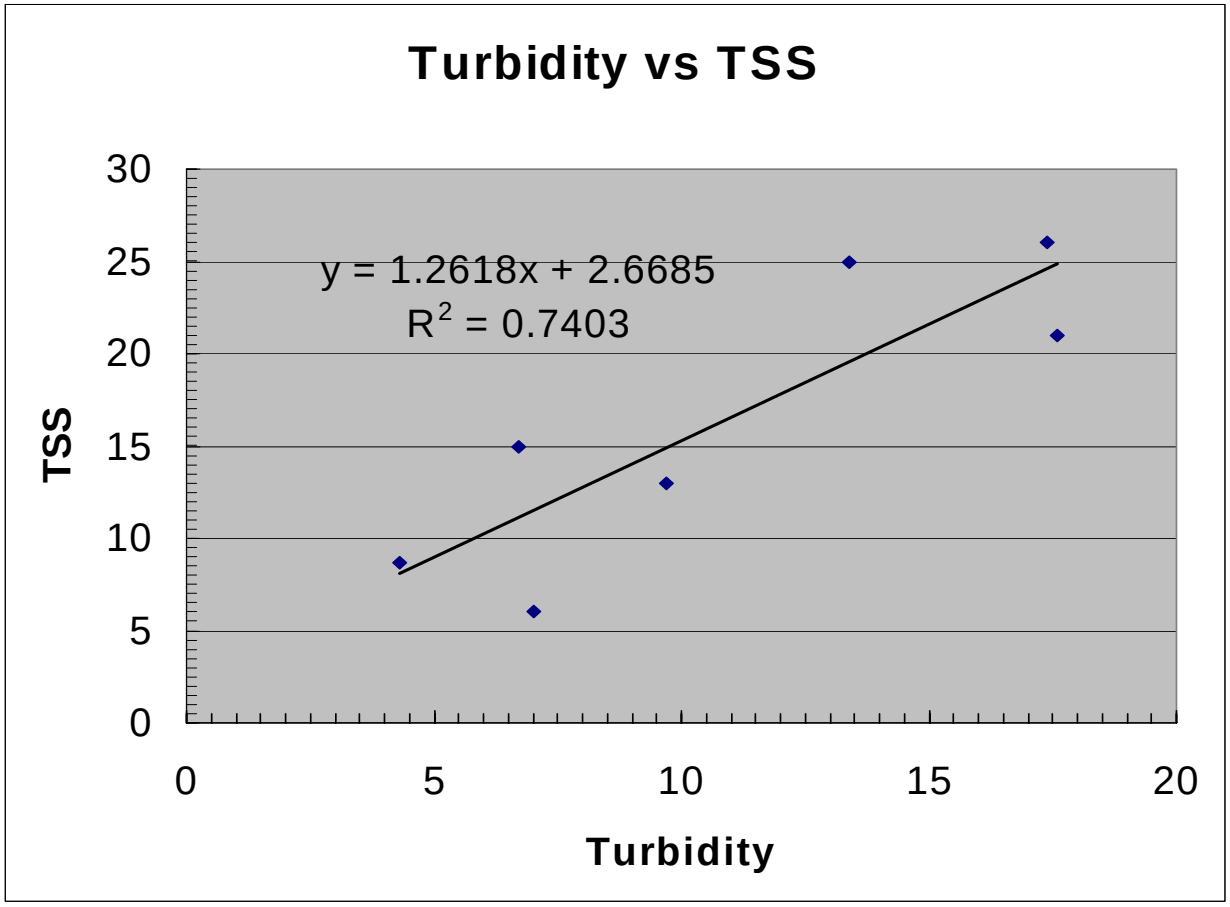
where,

C_R = numeric criterium of 10.65 NTU for turbidity and
D_f = dilution factor of 5.6 at the edge of the mixing zone for outfall 002[4]

ii. Current monitoring data were used to develop a correlation between TSS and NTU (see figure below) and the WLA at the end-of-pipe was converted from NTU to TSS.

$WLA_{TSS} = 1.2618 \times WLA_{NTU} + 2.6685$
$WLA_{TSS} = 78$ mg/l

[4] Brown and Caldwell, 1993



iii. Convert waste load allocation (WLA) to Long Term Average (LTA) for criterium using the following equation:

$LTA = WLA \times e^{(0.5\sigma n^2 - z\sigma n)}$

where,

$\sigma_n^2 = \ln(CV^2/n + 1) = 0.607$

n = number of sampling events required per month = 4 (default value)

z = 2.326 for 99th percentile probability basis

$LTA_c = 9.70$

iv. Calculate maximum daily and average monthly concentration-based limits (MDL and AML).

$MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)}$

where,

$\sigma^2 = \ln(CV^2 + 1) = 1.468$

CV = coefficient of variation = 1.83
z = 2.326 for 99th percentile probability basis

MDL = 78 mg/l

$AML = LTA \times e^{(z\sigma n - 0.5\sigma n^2)}$

where,

$\sigma_n^2 = \ln(CV^2/n + 1) = 0.607$

CV = coefficient of variation = 1.83

n = number of sampling events required per month = 4 (default value)

z = 1.645 for 95th percentile probability basis

AML = 25.8 mg/l

v. Calculate maximum daily and average monthly mass-based limits.

Monthly Average Loading

$= 25.8 \text{ mg/l} \times 8.34 \times 10^{-6} \times 780{,}932 \text{ gallons/day} = 168 \text{ lbs/day}$

Maximum Daily Loading

$= 78 \text{ mg/l} \times 8.34 \times 10^{-6} \times 780{,}932 \text{ gallons/day} = 508 \text{ lbs/day}$

The draft permit proposes the following effluent concentration-based and mass-loading limits for TSS:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Total Suspended Solids (TSS)	mg/L	25.8	78
	lbs/day	168	508

Based on the effluent monitoring data from January 2000 to August 2002, the Washington Beef facility would not be able to meet the proposed monthly average limits approximately 50% of the time. State water quality standards (WAC 173-201A-160(4)) indicate that discharge permits for point sources may incorporate schedules for achieving compliance with water quality criteria. Federal requirements for schedules of compliance are specified under 40 CFR §122.47 and include submittal of annual progress reports to EPA. The draft permit proposes the following milestones in regards to the annual reports.

Schedule of Compliance for Total Suspended Solids		
Task No.	Due at End of Year	Task Activity
1	1	Source investigation. The permittee must investigate the sources, extent, transport, and fate of suspended solids in outfall 002. Deliverable: The permittee must prepare a progress report of findings, and recommendations for further actions to reduce total suspended solids.
2	2	Feasibility study. The permittee must investigate the feasibility of measures to reduce total suspended solids in outfall 002 to meet the effluent limits. Evaluations should consider short- and long-term aspects of: 1) effectiveness of the measures (e.g. affords long-term protection, minimizes short term environmental impacts, and complies with effluent limits); and 2) implementability of the measures (e.g., technical feasibility). Readily implementable measures must be designed and constructed as soon as feasible. Measures that are more technically difficult or have more unknowns may need further investigations. Deliverable: The permittee must submit: 1) A report of the findings on the feasibility of measures; and 2) Design documents and/or construction completion reports for those measures that are readily implemented.
3[1]	3	Design and construction. The permittee must complete construction and operate measures such that effluent limits for total suspended solids in outfall 002 are achieved. Deliverable: The permittee must submit construction completion reports.
[1] Tasks scheduled past Year 2 are listed in anticipation of potential unknown conditions. The permittee does not need to complete these later tasks if compliance with the effluent limits is achieved sooner.		

State water quality standards (WAC 173-201A-160(4)(b)) specify that interim effluent limits shall be established for the period of time during which compliance with water quality criteria is deferred. Therefore, the draft permit includes the current effluent limits for TSS as interim limits during this period of time.

3. Oil and Grease

Similar to the current effluent limits for BOD and TSS, the previous effluent limits for oil and grease were water quality-based to ensure that the discharge did not cause or contribute to a water quality violation. Pursuant to Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l), the draft permit proposes the following effluent concentration-based and mass-loading limits for oil and grease:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Oil and Grease	mg/L	10	15
	lbs/day	65	98

4. Fecal Coliform Bacteria

   In addition to the federal technology-based requirements, Washington water quality standards (WAC 173-201A-030(2)(c)(i)(A)) specify for Class A surface waters that the fecal coliform organism levels shall not exceed a geometric mean value of 100 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/100 mL. Therefore, the draft permit proposes the following effluent limits:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Fecal Coliform Bacteria [1]	# / 100 ml	100	400
[1] no more than 10 percent of all samples obtained for calculating the geometric mean value shall exceed 200 colonies/100 mL.			

5. Hydrogen ion concentration (pH)

   In addition to the federal technology-based requirements, Washington water quality standards for aquatic life specify pH limits of 6.5 to 8.5 standard units (WAC 173-201A-030(2)(c)(v)). Therefore, the draft permit proposes a pH limit of 6.5 to 8.5.

6. Temperature

   Washington water quality standards specify numeric temperature criteria for Class A surface waters (WAC 173-201A-030(2)(c)(iv)). Temperatures shall not exceed 18˚C for freshwater and when natural conditions exceed 18˚C, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3˚C. Therefore, the draft permit proposes a maximum temperature limit of 18˚C.

7. Total Ammonia (NH_3 as N)

   a. Determine the appropriate water quality criteria

      Ammonia is considered a toxic substance to aquatic organisms and state water quality standards specify numeric criteria for cold water biota depending upon pH and temperature of the receiving water (WAC 173-201A-030(2)(c)(vii) and 173-201A-040). Based on current monitoring data, the 95th percentile temperature (20.56˚C) and pH (7.62 s.u.) were used to calculate an acute criterion of 12.60 mg/L and a chronic criterion of 1.60 mg/L total ammonia (NH_3 as N).

   b. Determine whether there is "reasonable potential" to exceed the criteria

      i. Flow of Wanity Slough: Typically, the 1Q10 or 1-day low flow that has a 10 percent chance of occurring in any given year and 7Q10 or 7-day average low

flow that has a 10 percent chance of occurring in any given year are used to calculate reasonable potential. Given the lack of historical flow data for the Wanity Slough, the lowest calculated flow of 11.3 cfs (Brown and Caldwell, 1993) was used instead of the 1Q10 and 7Q10 flows.

ii. Mixing zones: The criteria were compared to the 95th percentile receiving water or "background" ammonia concentration of 0.60 mg/L total ammonia (NH_3 as N)[5]. Since the receiving water or background concentration of ammonia is less than the acute and chronic criteria, a mixing zone was incorporated into the reasonable potential calculations for ammonia. In accordance with State water quality standards (WAC 173-201A-100-7), twenty-five percent of the lowest calculated flow (ie. 11.3 cfs) was used to calculate reasonable potential.

iii. There is reasonable potential to exceed water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the criteria. The maximum projected concentration is calculated from the following equation:

$$C_R = \frac{(C_E \times Q_E) + (C_s \times Q_s \times \%MZ_s)}{Q_E + (Q_s \times MZ_s)}$$

where,

Nomenclature	Parameter	Value
	acute criterion	12.60 mg/l
	chronic criterion	1.60 mg/l
$C_{R\text{-}Acute}$	projected receiving water concentration (acute) at the edge of the mixing zone in Wanity Slough	14.56 mg/l
$C_{R\text{-}Chronic}$	projected receiving water concentration (chronic) at the edge of the mixing zone in Wanity Slough	14.56 mg/l
C_E	maximum projected effluent concentration from Washington Beef, Inc. = C_{max} × RPM where C_{max} is the maximum reported effluent concentration (48.5 mg/L) and RPM is the reasonable potential multiplier (0.48)	20.74 mg/L
C_S	upstream concentration of pollutant in Wanity Slough	0.60 mg/l
Q_E	proposed maximum effluent flow from Washington Beef, Inc.	1.43 cfs
Q_S	upstream flow in Wanity Slough ♦ lowest calculated flow	11.3 cfs
$\%MZ_S$	mixing zone of Wanity Slough (% of flow volume, background < criteria)	25%

[5] Using the Grubb's statistical test, the October 1994 ammonia result of 1.35 mg/L was determined to be an outlier and not included in the calculation of the background ammonia concentration.

The projected acute and chronic ammonia concentrations at the edge of the mixing zone in the receiving water (i.e. Wanity Slough) are greater than their respective criterion. Therefore, there is reasonable potential for the discharge from the Washington Beef facility to cause an exceedance of the numeric criteria for ammonia.

c. Effluent Limitation Calculation

i. Determine waste load allocations ($WLA_{a,c}$ and WLA_c) using both acute and chronic criteria, respectively, in the following equation:

$$C_R = \frac{(C_E \times Q_E) + (C_S \times Q_S \times \%MZ_S)}{Q_E + (Q_S \times \%MZ_S)}$$

where,

Nomenclature	Parameter	Value
$C_{R\ (Acute)}$	receiving water concentration at the edge of the mixing zone in Wanity Slough equals acute criterion	12.60 mg/l
$C_{R\ (Chronic)}$	receiving water concentration at the edge of the mixing zone in Wanity Slough equals chronic criterion	1.60 mg/l
C_E	waste load allocation for Washington Beef, Inc.	
C_S	upstream concentration of pollutant in Wanity Slough	0.60 mg/l
Q_E	maximum effluent flow from Washington Beef, Inc.	1.43 cfs
Q_S	minimum upstream flow in Wanity Slough	11.3 cfs
$\%MZ_S$	mixing zone of Wanity Slough (% of flow volume, background < criteria)	25%

For acute criteria: $WLA_{a,c} = C_E = 18.91$ mg/L

For chronic criteria: $WLA_c = C_E = 2.12$ mg/L

b. Convert the waste load allocation (WLA) to Long Term Average (LTA) for acute and chronic criteria using the following equation:

$LTA_{a,c} = WLA_{a,c} \times e^{(0.5\sigma^2 - z\sigma)}$

where,

$\sigma^2 = \ln(CV^2 + 1) = 2.96$

CV = coefficient of variation = 4.27

z = 2.326 for 99th percentile probability basis

$LTA_{a,c} = 1.52$

$LTA_c = WLA_c \times e^{(0.5\sigma n^2 - z\sigma n)}$

where,

$\sigma_n^2 = \ln(CV^2/n + 1) = 1.72$

n = number of sampling events required per month = 4 (default value)
z = 2.326 for 99th percentile probability basis

$LTA_c = 0.17$

c. Determine the lower (more limiting) of the two long-term averages ($LTA_{a,c}$ and LTA_c) and use to calculate maximum daily and average monthly limits (MDL and AML).

$LTA = \text{minimum } (LTA_{a,c}, LTA_c) = LTA_c = 0.17$

$MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)}$

where,
$\sigma^2 = \ln(CV^2 + 1) = 0.257$
CV = coefficient of variation = 0.541
z = 2.326 for 99th percentile probability basis

MDL = 2.12 mg/L

$AML = LTA \times e^{(z\sigma_n - 0.5\sigma_n^2)}$

where,
$\sigma_n^2 = \ln(CV^2/n + 1) = 1.72$
CV = coefficient of variation = 4.27
n = number of sampling events required per month = 4 (default value)
z = 1.645 for 95th percentile probability basis

AML = 0.62 mg/L

d. Calculate maximum daily and average monthly mass-based limits.

Monthly Average Loading
= 0.62 mg/l × 8.34 x 10^{-6} × 780,932 gallons/day = 4.0 lbs/day

Maximum Daily Loading
= 2.12 mg/l × 8.34 x 10^{-6} × 780,932 gallons/day = 13.8 lbs/day

The draft permit proposes the following effluent limitations for ammonia:

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Ammonia (NH_3-N)	mg/L	0.62	2.12
	lbs/day [1]	4.04	13.81
[1] Effluent limits based on the 95th percentile flow of 780,932 gallons per day.			

Based on the effluent monitoring data from January 2000 to August 2002, the Washington Beef facility would not be able to meet the proposed monthly average and maximum daily limits approximately 62.5% and 5.4% of the time, respectively. State water quality standards (WAC 173-201A-160(4)) indicate that discharge permits for point sources may incorporate schedules for achieving compliance with water quality criteria. Federal requirements for schedules of compliance are specified under 40 CFR §122.47 and include submittal of annual progress reports to EPA. The draft permit proposes the following milestones in regards to the annual reports.

Schedule of Compliance for Total Ammonia

Task No.	Due at End of Year	Task Activity
1	1	Source investigation. The permittee must investigate the sources, extent, transport, and fate of total ammonia in outfall 002. Deliverable: The permittee must prepare a progress report of findings, and recommendations for further actions to reduce total suspended solids.
2	2	Feasibility study. The permittee must investigate the feasibility of measures to reduce total ammonia in outfall 002 to meet the effluent limits. Evaluations should consider short- and long-term aspects of: 1) effectiveness of the measures (e.g. affords long-term protection, minimizes short term environmental impacts, and complies with effluent limits); and 2) implementability of the measures (e.g., technical feasibility). Readily implementable measures must be designed and constructed as soon as feasible. Measures that are more technically difficult or have more unknowns may need further investigations. Deliverable: The permittee must submit: 1) A report of the findings on the feasibility of measures; and 2) Design documents and/or construction completion reports for those measures that are readily implemented.
3[1]	3	Design and construction. The permittee must complete construction and operate measures such that effluent limits for total ammonia in outfall 002 are achieved. Deliverable: The permittee must submit construction completion reports.

[1] Tasks scheduled past Year 2 are listed in anticipation of potential unknown conditions. The permittee does not need to complete these later tasks if compliance with the effluent limits is achieved sooner.

State water quality standards (WAC 173-201A-160(4)(b)) specify that interim effluent limits shall be established for the period of time during which compliance with water quality criteria is deferred. Therefore, the draft permit includes the current effluent limits for total ammonia as interim limits during this period of time.

APPENDIX D

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 Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) regarding potential effects an action may have on listed endangered species. In correspondence dated October 24, 2002, NMFS indicated that Wanity Slough and Marion Drain both support small numbers of the Middle Columbia steelhead (*Onchorynchus mykiss*) which has been listed as threatened in the Middle Columbia River basin. In a letter dated September 30, 2003, the USFWS identified the following federally- listed species in the vicinity of the discharge:

Endangered Species:
none

Threatened species:
Bald eagle (*Haliaeetus leucocephalus*)
Middle Columbia River steelhead (*O. mykiss*)
Bull Trout (*Salvelinus confluentus*)
Ute ladies'-tresses (*Spiranthes diluvialis*)

II. **Potential Effects for Species**

A. Bald eagle (*Haliaeetus leucocephalus*)

Bald eagles begin to appear at wintering sites in early November and concentrate at locations with open water during the colder months when smaller or slower moving waterbodies freeze (Spahr 1990). Diet includes fish species, mule deer, ground squirrels, rabbits, waterfowl, and other small mammals (Sphar 1990). Consumption of fish relative to other species declines in the colder months as water bodies freeze. Water quality could potentially affect bald eagles through four avenues: prey displacement or quantitative decline, prey mortality, bioaccumulation in prey, or direct consumption. One of the general recommendations for augmenting bald eagle populations is to reduce mortality through exposure to contaminants. The bald eagle historically ranged throughout North America except for extreme northern Alaska and Canada and central and southern Mexico. A significant population of bald eagles winters in Washington and some are presumed to remain in the state year round. As discussed above, the primary threats to bald eagles are prey displacement or mortality, bioaccumulation of contaminants through prey species, or direct exposure to contaminants. Reissuance of the NPDES permit for the Washington Beef facility would not affect prey availability/distribution. Additionally, it would not result in a potential increase of toxic compounds in prey species or an increase in the potential for direct exposure to toxics. The proposed permit requires monitoring for potentially harmful contaminants, hence, it is not expected that reissuance of the wastewater discharge permit would affect the bald eagle.

B. Middle Columbia steelhead (*Onchorynchus mykiss*)

Steelhead have the most complex life histories of any Pacific salmon species. These fish have variable run timing and degree of anadromy and are capable of more than one spawning cycle. Inland steelhead of the Middle Columbia River Basin are 'stream-maturing' as they enter freshwater in a sexually immature state and require several months in freshwater before they mature and spawn. These stream maturing fish are referred to as 'summer run' based on the time that they enter freshwater. Summer steelhead of the Columbia River subbasin have generally one potential run timing, which is the A-run. The A-run fish have generally spent one year in the ocean and enter freshwater from June to August.

Steelhead can have various life histories in terms of the degree of anadromy. The anadromous form that migrates between the ocean and freshwater are termed 'steelhead' while the non- anadromous or 'resident' form does not migrate and is called 'rainbow trout'. Like steelhead, rainbow trout spawn in winter/spring and emerge in spring/early summer. In inland *O. mykiss* populations, including the Middle Columbia River basin, both anadromous and non- anadromous forms commonly co-occur. Nonanadromous *O. mykiss* of the inland type are often called Columbia River redband trout. Although both the anadromous and non-anadromous forms are classified as the same species, taxonomically, the relationship of the two forms in a given area is typically unclear.

Dam construction (which restricts the ability of individuals to reach their spawning areas) and habitat loss and degradation due to human activities such as land development, logging, mining, and agriculture are the primary factors that have affected Steelhead populations. EPA has determined that the reissuance of the NPDES permit for the Washington Beef facility will not impact steelhead populations because it will not lead to increased dam construction or result in habitat loss or degradation.

C. Bull Trout (*Salvelinus confluentus*)

The bull trout is a member of the char subgroup of the family Salmonidae. Bull trout population are known to exhibit two distinct life history forms: 1) resident bull trout that spend their entire life cycle in the same (or near) streams in which they were hatched, and 2) migratory bull trout which can exhibit either a fluvial life history - spawning in tributary streams where the young rear from one to four years before migrating to a river, or an adfluvial form - spawning in tributary streams where the young rear before migrating to a lake (Farley and Shepard 1989).

Bull trout generally mature at between 5 and 7 years of age (Farley and Shepard 1989; Goetz 1989; Leathe and Enk 1985). Spawning occurs from August through November (Armstrong and Murrow 1980; Brown 1994; McPhail and Murray 1979). Embryos incubate over winter and hatch in late winter or early spring (Weaver and White 1985). Emergence has be observed over a relatively short period of time after a peak in stream discharge from early April through May (Rieman and McIntyre 1993). In-stream habitat requirements make bull trout exceptionally sensitive to activities which directly or indirectly affect stream channel integrity and natural flow patterns, including groundwater flow. Stream flow, bed load

movement, and channel instability influence the survival of juvenile bull trout (Weaver 1985; Goetz 1989). The presence of fine sediments reduces pool depth, alters substrate composition, reduces interstitial spaces in substrate, and causes channel braiding, all of which can negatively impact the survival of bull trout eggs and fry. Cover, such as large woody debris, undercut banks, boulders, pools, side margins, and beaver ponds, is heavily utilized by all life stages of bull trout for rearing, foraging and resting habitat, as well as for protection from predators (USFWS) 1998a). Bull trout prefer cold water, and temperatures in excess of 15˚C are considered to limit their distribution (Rieman and McIntyre 1993). USACE (1999) suggested that water temperature influences bull trout distribution more than any other habitat factor. Finally, migration corridors are important for sustaining bull trout populations, allowing for gene flow and connecting wintering areas to summer/foraging habitat (Rieman and Mcintyre 1993).

The bull trout is threatened by habitat degradation (e.g. land management activities with negative impacts on water quality or spawning habitat); passage restrictions, mortality, or entrapment at dams; and competition from non-native lake and brook trout (USFWS 1998b). According to USACE (1999), bull trout populations are likely affected by dam operation, as well as, augmentation (i.e., spill) used to mitigate effects on salmon migration by increasing fish passage efficiency. Bull trout growth, survival and long-term population persistence are correlated with stream habitat conditions such as cover, channel stability, substrate composition, temperature, and migratory corridors (Rieman and McIntyre 1993). These habitat features are often impaired as the result of land management activities such as forest harvest, road building, hydropower development, irrigation diversions, mining and grazing. EPA has determined that the reissuance of the NPDES permit for the Washington Beef facility will not impact bull trout populations because it will not lead to increased habitat degradation or changes in water temperature. The effluent limitations in the permit are based on the state water quality standards which protect for cold water biota including salmonid species. In addition, the facility is required to monitor the effluent and receiving water in order to assist with future efforts to evaluate the reasonable potential for the discharge to cause or contribute to the receiving waters not meeting applicable state/tribal water quality criteria and the development of water quality-based effluent limits.

D. Ute ladies' - tresses (*Spiranthes diluvialis*)

Ute ladies' - tresses is a perennial terrestrial orchid (family Orchidaceae). This species generally inhabits riverbanks where inundation occurs infrequently (Sheviak 1984). Ute ladies' tresses is endemic to moist soils in mesic or wet meadows near springs, lakes, and perennial streams. The elevation range of known occurrences is 4,000 to 7,000 feet. Generally, this species occurs in areas where the vegetation is relatively open (e.g. grass and forb dominated sites), but some populations are found in riparian woodlands. This orchid is found in several areas of the interior western United States. This species has only recently been recorded on a few sites in central Washington, where it can occur at relatively low elevations (down to roughly 700 feet in Chelan County). The primary threats to the species are urban development and watershed alterations in riparian and wetland habitats and

invasions of exotic plants species such as purple loosestrife, whitetop and reed canary grass. The reissuance of the NPDES permit will not affect any of these factors and, consequently, will have no impact on this species.

EPA will provide USFWS and NMFS with copies of the draft permit and fact sheet during the public notice period. Any comments received from these agencies regarding this determination will be considered prior to issuance of this permit.

APPENDIX E

ESSENTIAL FISH HABITAT ASSESSMENT

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EPA has tentatively determined that the issuance of this permit will not affect any EFH species in the vicinity of the discharge, therefore no consultation is required.

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

The NMFS has requested that EFH assessments contain the following requirements:

1. **Species in the Facility Area** The NMFS recommended the following websites for specific EFH information relating to the project area:
http://www.nwr.noaa.gov/1habcon/habweb/msa.htm.
The Habitat Assessment Reports stated Wanity Slough has not been designated to support any species for EFH.

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 in accordance with the Washington water quality standards to protect aquatic life species in Wanity Slough. The NPDES permits are established to protect water quality in accordance with State 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 discharger 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, pollutants of concern identification, threshold concentration determination, exposure considerations, dilution modeling and analysis, multiple sources and natural background consideration, fate and transport variability, and monitoring duration and frequency.

APPENDIX F

ANTIDEGRADATION

In addition to water quality-based limitations for pollutants that could cause or contribute to exceedances of numeric or narrative criteria, EPA must consider the State's antidegradation policy (WAC 173-201A-070). This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality meets the standard. For high quality waters, the antidegradation provisions require that the State find that allowing lower water quality is necessary to accommodate important economic or social development before any degradation is authorized. If water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation. The proposed maximum daily limits for BOD and TSS in the draft permit are higher than those in the current permit. The proposed limits are still protective of the beneficial uses because they are water quality-based effluent limits.

The antidegradation policy of the state of Washington is stated as follows:

i. Existing beneficial uses shall be maintained and protected and no further degradation which would interfere with or become injurious to existing beneficial uses shall be allowed.
ii. Whenever the natural conditions of said waters are of a lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria.
iii. Water quality shall be maintained and protected in waters designated as outstanding resource waters.
iv. Whenever waters are of a high quality than the criteria assigned for said waters, the existing water quality shall be protected and pollution of said waters which will reduce the existing quality shall not be allowed, except in those instances where:

    (1) It is clear, after satisfactory public participation and intergovernmental coordination, that overriding considerations of the public interest will be served;
    (2) All wastes and other materials and substances discharged into said waters shall be provided with all known, available, and reasonable methods of prevention, control, and treatment by new and existing point sources before discharge. All activities which result in the pollution of waters from nonpoint sources shall be provided with all known, available, and reasonable best management practices; and

    (3) When the lowering of water quality in high quality waters is authorized, the lower water quality shall still be of high enough quality to fully support all existing beneficial uses.