



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10

1200 Sixth Avenue  
Seattle, Washington 98101

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DEPARTMENT OF ECOLOGY

MAY 28 1996

WATER QUALITY PROGRAM



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Publication # 96-10-201

Reply to  
Attn of: OW-134

Michael T. Llewelyn, Program Manager  
Water Quality Program  
Washington Department of Ecology  
P.O. Box 47600  
Olympia, WA 98504-7600

Re: Approval of the Water Quality-Based National Primary Discharge Elimination Systems Permit (NPDES) for the City of Sumas as a Total Maximum Daily Load (TMDL) for Sumas River-Biochemical Oxygen Demand, Ammonia-Nitrogen, Chlorine

Dear Mr. Llewelyn: *Mike*

I am pleased to approve the following TMDL and associated wasteload and load allocations that were submitted by the Washington Department of Ecology (Ecology) to the U. S. Environmental Protection Agency (EPA) on February 9, 1996:

<u>Waterbody Segment</u>	<u>Waterbody Name</u>	<u>TMDL Parameter</u>
WA-01-2010	Sumas River	Biochemical Oxygen Demand (BOD) Ammonia-Nitrogen Chlorine

In accordance with Section 303(d) of the Clean Water Act and 40 CFR §130.7, Ecology has developed and submitted a TMDL for the Sumas River in anticipation that limits set in the NPDES permit will attain and maintain state water quality standards for dissolved oxygen, ammonia-nitrogen, and chlorine.

The Sumas River TMDL will be implemented through the National Primary Discharge Elimination Systems Permit (NPDES) for the City of Sumas (Permit No. WA-002049-4). During the next NPDES permit reissuance, the permit must be consistent with the TMDL.

Reply to: WD-139

MEMORANDUM

Subject: Recommendation for TMDL Approvals

Sumas River  
Waterbody Segment No. (WA-01-2010)

TMDL Parameters: ● Biochemical Oxygen Demand (BOD<sub>5</sub>)  
● Ammonia-Nitrogen  
● Chlorine (TRC)

From: Curry D. Jones, Environmental Protection Specialist  
Water Quality Unit

To: File

- Document A - EPA Approval TMDL Checklist
- Document 1 - Transmittal Letter - February 9, 1996
- Document 2 - Sumas River Receiving Water Study, Prepared by: Bob Cusimano, Washington Department of Ecology Environmental Investigations and Laboratory Services Program, Oct. 1992,
- Document 3 - City of Sumas Class II Inspection, Sept. 23-25, 1991, Prepared by: Norm Glenn, Washington Department of Ecology Environmental Investigations and Laboratory Services Program, October 1992
- Document 4 - Total Maximum Daily Load Fact Sheet
- Document 5 - Sumas River TMDL Public Participation Materials
- Document 6 - National Primary Discharge Elimination System Waste Discharge Permit, City of Sumas; Permit No. WA-002049-4, Expiration Date: January 15, 2000
- Document 7 - National Primary Discharge Elimination System Waste Discharge Permit, City of Sumas; Permit No. WA-002049-4, Expiration Date: January 28, 1990
- Document 8 - Washington Department of Ecology, Fax Transmittal Sheet, Environmental Investigation and Laboratory Service Program (EILS), From: Steve Butkus, WDOE, To: Curry Jones, EPA, April 18, 1996, Attached: Department of Ecology Companion Order No. DE95WQ-N105, Te City of Sumas, April 20, 1995

1. Transmittal Letter: Complete (Document 1)

- States that TMDLs have been established in accordance with Section 303(d) of the Clean Water Act and 40 CFR 130.7.
- 2. Problem Assessment - Complete (Documents 2 and 3)
- The Sumas River, a Class A waterbody in Whatcom County, is the receiving water for the town of Sumas Wastewater treatment plant (WWTP). The oxidation ditch WWTP serves a population of approximately 750 people and discharges to the Sumas River several hundred feet before the river crosses the United States-Canadian international border. Johnson Creek, a major tributary to the Sumas River, drains most of the agricultural lands. Johnson Creek meanders through the City of Sumas before joining the Sumas River about one mile above the WWTP outfall.
- The Sumas River Watershed is primarily used for agriculture, specifically dairy farming. In most areas, dairy pastures extend along the banks of the Sumas River.
- Ecology's 1992 Receiving Water Study identified specific concerns with biochemical oxygen demand, ammonia-nitrogen, chlorine, and fecal coliform.
- A Streeter-Phelps analysis, indicated that a dissolved oxygen violation due to WWTP discharge would occur under summer design conditions.
- A chlorine analysis indicated that based on existing discharge levels, total residual chlorine (TRC) would exceed the proposed daily permit limits under both annual and seasonal discharge conditions.
- Nonpoint sources upstream of the WWTP may also be contributing to the fecal coliform and nutrient loads to the Sumas River. Results suggest that downstream fecal coliform concentrations are most attributed to agricultural nonpoint loading, specifically dairy farming, to the Johnson Creek drainage. In most areas, dairy pastures extend along the banks of the Sumas River.

Review Notes: The problem assessment provides the following information: 1) background information on water quality problems in the Sumas River Watershed and their likely causes; 2) land-use activity in the watershed; 3) projected (using modeling) water quality violations for TRC and dissolved oxygen. Also, based on proposed mixing zone analysis, exceedances of chlorine criteria are projected.

TMDL Calculations: Complete (Document 2)

- The Sumas River TMDL establishes seasonal loadings capacities (May through October) (November through April) for BOD, total residual chlorine, and ammonia-nitrogen. A wasteload allocation was given to the City of Sumas WWTP for all three parameters. A load allocation was also included in this TMDL to account for the non-point sources and an allowable mixing zone for toxic substances ammonia-nitrogen and chlorine. Under the new NPDES permit, more stringent limits were given to the point source discharger.

Review Notes: This TMDL contains WLAs and LAs for all parameters to account for point source loading, nonpoint source loading and mixing zone for toxics into the Sumas River. The Receiving Water Study included the following: 1) a loading capacity for each TMDL parameter; 2) an appropriate WLAs for the point source and LA for the nonpoint source and a LA as a reserve (mixing zone) for each TMDL parameter; 3) justifications on how the WLAs and LAs were decided is also provided. 4) more importantly, the TMDL links the individual allocations (both WLA and LA) to the attainment of water quality standards. This TMDL did take into account that nonpoint source (fecal coliform) is a problem in the Sumas River. For BOD<sub>5</sub>, the Sumas River TMDL cranked down on the point source (WLA) and the remaining allocation was given to nonpoint sources. For ammonia nitrogen, the Sumas River TMDL cranked down on the point source (WLA) and the remaining allocation was devied up between the nonpoint sources and the mixing zone for ammonia. For chlorine, the Sumas River TMDL cranked down on the point source (WLA) and the remaining allocation was given to zone for chlorine.

Supporting References: Complete (Document 2)

- Design condition (instream flow, temperature, and pH) for the Sumas River TMDL, were developed from the September 1992 data collected for the Receiving Water Study, using both annual and semiannual flow statistics.
- Ammonia instream and effluent concentration were found well below acute and chronic toxicity criteria, however effluent ammonia concentration would be expected to increase if existing NPDES permit limits for BOD are reached. A WLA of 9.76 was initially allocated to the City of Sumas.
- A Streeter-Phelps analysis, under design conditions, indicated that under the annual and winter scenarios, existing technology-based permit limits will not reduce river DO below the 8.0 mg/L standard. The summer design condition did predict a DO violation due to WWTP discharge. In order to maintain the 8.0 mg/L standard under summer design conditions, the CBOD5 effluent concentration could not exceed 19 mg/L.

- In order to meet the 8.0 mg/L DO standard under summer design conditions, the alternative analysis indicated that reducing both the proposed summer ammonia WLA from 9.76 to 5 mg/L and the CBOD5 from 45 mg/L to 33 mg/L would be necessary.
- The chlorine analysis indicated that based on existing discharge levels, TRC would exceed the proposed daily permit limits under both annual and seasonal discharge conditions. Water quality based limits were developed using 7Q20 design stream flow and EPA procedures. Even with these water quality based NPDES permit limits, the study indicated that limits cannot be met without a provision of dechlorination.
- A mass balance calculation was used to determine the loading capacity for fecal coliform. Nonpoint source/background was determined the greatest contributor of water quality exceedance for fecal coliform. Unless nonpoint/background sources of fecal contamination are controlled, the stream is unlikely to meet the water quality standard. Specific controls for nonpoint source pollution were not addressed in this TMDL.

Review Notes: Documentation clearly indicates the basis for each TMDL calculation. The 7Q20 design flow of 13.2 cfs was used in determining the load capacities. Wasteload allocations and load allocation have been developed for each parameter.

Public Participation: Complete (Document 3)

Public notice of the City of Sumas NPDES Permit.

Review Notes: Public participation process was adequate. Ecology only received 2 comments on the proposed NPDES Permit. Neither of the comments received pertained to the TMDL, but were on other permit related issues. An adequate response was provided.

Enforceability/Implementation: Complete (Document 2 and 4)

- NPDES Permit No. WA-002049-4, City of Sumas Wastewater Treatment Plant (WWTP)

Review Notes: The NPDES permit contains seasonal wasteload allocation for Biochemical Oxygen Demand, Ammonia-Nitrogen, and Total Residual Chlorine. The permit also contains pretreatment limits to ensure that all commercial and industrial users of the wastewater treatment plant system are in compliance with the pretreatment regulations. Ecology has indicated that the City of Sumas will be unable to meet the new chlorine limits with the installed equipment. Ecology has submitted a companion order to the City of Sumas setting a compliance schedule and interim

effluent limits for chlorine concurrently with the re-issued NPDES permit. The companion order indicates that the City of Sumas shall:

- Conduct an engineering evaluation of the wastewater treatment facility to determine what action are necessary to bring the treatment facility into compliance with the permit effluent limits for chlorine.
- No later than January 15, 2000, the Permittee shall complete construction of dechlorination facilities or an alternative disinfection process capable of achieving final effluent limits specified in Conditions NPDES Permit No. WA-002049-4.
- The interim wastewater discharge limits will be enforced for the City of Sumas WWTP from the effective date of the NPDES Permit No. WA-002049-4
- Chlorine        Monthly Avg. -->0.5 mg/L  
                  Daily Max.    --->1.0 mg/L

TMDL Effectiveness Plan:

- The permit contains effluent monitoring for the following parameters:
  - Biochemical Oxygen Demand
  - Total Suspended Solids
  - Fecal Coliform
  - Total Residual Chlorine
  - Ammonia-Nitrogen
- Through Washington Department of Ecology's Watershed Approach, monitoring data will be collected during the 1997 and 1998 assessment cycle. From this assessment, NPDES permits will be modified and other corrective actions will be initiated (if found necessary) during 2000 to assure the TMDL remains effective at attainment of water quality standards.

EPA Recommendation: It is recommended that the Sumas River TMDL be approved. Watch to ensure that the TMDL is implemented through appropriate conditions upon reissuance.

**TOTAL MAXIMUM DAILY LOAD  
FACT SHEET**

Department of Ecology  
P.O. Box 47600  
Olympia, WA 98504-7600

Developed pursuant to 40 CFR 130.7 and the Federal Clean Water Act

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**WATERBODY SEGMENTS:**

The Sumas River (WA-01-2010) has been assigned three wasteload allocations (WLA) and load allocations (LA) for the period from May 1 through October 30.

**TMDL PARAMETERS:**

**APPLICABLE RULES:**

Biochemical Oxygen Demand (BOD)	WAC 173-201A-030(2)(c)(ii)(A)
Ammonia-N	WAC 173-201A-030(2)(c)(ii)(A) WAC 173-201A-040(3)
Chlorine	WAC 173-201A-040(3)

**SOURCE ALLOCATIONS AND LOADING CAPACITIES:**

BOD, 5-day	Loading Capacity	163.0 lbs/day (Table 8)
	WLA City of Sumas	19.8 lbs/day (Permit)
	LA Nonpoint Sources	143.2 lbs/day
	LA Reserve	0.0 lbs/day
Ammonia-N	Loading Capacity	39.6 lbs/day (Table 5)
	WLA City of Sumas	4.4 lbs/day (Permit)
	LA Nonpoint Sources	2.5 lbs/day (Table 5)
	LA Reserve	32.7 lbs/day
Chlorine	Loading Capacity	0.79 lbs/day (Table 10)
	WLA City of Sumas	0.02 lbs/day (Permit)
	LA Reserve	0.77 lbs/day

**TECHNICAL DOCUMENTS:**

Cusimano, B. 1992. Sumas River Receiving Water Study. Washington Dept. of Ecology, October 1992.

Cusimano, B. 1992. City of Sumas Class II Inspection, September 23-25, 1991. Washington Dept. of Ecology, October 1992.

**PUBLIC PARTICIPATION:**

After publication of the TMDL study in October 1992, copies of the report were sent the City of Sumas and other interested parties. On March 8 and March 15, 1995 legal notices were published in the Bellingham Herald soliciting public comment on the NPDES which represented the implementation of the TMDL.

Ecology received only two comments from the City of Sumas. Neither of these comments were about the TMDL, but were on other permit related issues. A response to these comments was prepared prior to final issuance of the permit.

**TMDL IMPLEMENTATION:**

The WLAs have been implemented through effluent limitation conditions in the NPDES permit for the City of Sumas. The Sumas POTW permit was issued April 20, 1995. Work is also underway to investigate the possibility of routing the effluent to a treatment plant in British Columbia.

The LAs represent current conditions in the watershed. These will be will be maintained through Ecology's voluntary compliance program for nonpoint source pollution control. Pollution sources not under NPDES authority can be controlled through administrative order if voluntary compliance fails.

**MONITORING TMDL EFFECTIVENESS:**

Monitoring data will be collected during 1997 and 1998 as part of the next assessment cycle of Ecology's Watershed approach. Permits will be modified and other corrective actions will be initiated during 2000 to assure the TMDL remains effective at attainment of water quality standards.