UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Reply to
Attn of: WD-139

Publication # 93-10-206

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

Re: Approval of Total Maximum Daily Load (TMDL) for Weaver Creek

Dear Mr. Llewelyn:

I am pleased to approve the following TMDLs and associated wasteload allocations that were submitted by your Department to the Environmental Protection Agency (EPA) on August 25, 1992:

Waterbody Segment	Waterbody Name	TMDL Parameter
WA-28-1027	Weaver Creek	Biochemical Oxygen Demand Ammonia-Nitrogen

Controls on biochemical oxygen demand and ammonia-nitrogen have been established to ensure compliance with the state's water quality standard for dissolved oxygen. Wasteload allocations have been implemented through effluent limitations in a National Pollutant Discharge Elimination System (NPDES) permit for the Town of Battle Ground (NPDES Permit No. WA-002093-1).

By EPA's approval of this TMDL, it is now incorporated into the state's water quality management plan.

Sincerely,

for/ Charles E. Findley
Director, Water Division

cc: Lynn Singleton, Ecology
Steve Butkus, Ecology
Will Kendra, Ecology

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

FEB 1993

Reply to
Attn of: WD-139

MEMORANDUM

SUBJECT: Recommendation for TMDL Approval
Weaver Creek - Waterbody Segment No. WA-28-1027

TMDL Parameters: Biochemical Oxygen Demand (5 day), Ammonia-Nitrogen

FROM: Amber Wong, Standards-to-Permits Specialist
Water Quality Section

TO: File

- TMDL submitted August 25, 1992
- TMDL package completed February 23, 1993
  - EPA Approval Checklist
  - Document 1: Transmittal letter
  - Document 2: TMDL document
  - Document 3: Prescott, S. 1975. Battle Ground STP Efficiency Study. Memorandum to Gerry Calkins dated September 10, 1975. Washington State Department of Ecology.
  - Document 4: Moore A. and D. Anderson. 1978. Weaver Creek-Battle Ground Sewage Treatment Plant Impact Study. Washington State Department of Ecology, Olympia, WA.
  - Document 5: Barton, T. B. 1979. Second Quarter 1979 Water Quality Monitoring Report. Southwest Washington Health District.
  - Document 6: Peake, L. 1980. Determination of Nitrogenous Oxygen Demand for Wooden (Weaver) Creek. Memorandum to Howard Steeley dated June 16, 1980. Clark County Public Works, Vancouver,

WA.

- Document 7: Kiernan, K. 1983. Battle Ground STP and Weaver Creek Reconnaissance Visit. Memorandum to Bill Yake dated August 17, 1983, Washington State Department of Ecology.

- Document 8: Heffner, M. 1984. Battle Ground Sewage Treatment Plant Class II Inspection and Receiving Water Study, December 6-7, 1983. Memorandum to J. Neel and M. Morhous dated June 8, 1984, washington State Department of Ecology.

- Document 9: Crawford P. 1986. Weaver Creek Low-Flow, Point Source Reconnaissance. Memorandum to Jon Neel dated February 3, 1986, Washington State Department of Ecology.

- Document 10: National Pollutant Discharge Elimination System Waste Discharge Permit No. WA-002093-1 for March 27, 1981 to March 27, 1986.

Transmittal letter - Complete (see Document 1)

- states that TMDL has been established in accordance with Section 303(d)(1) of the Clean Water Act.

- **Review note: meets requirements**

Problem Assessment - Complete (see Documents 4, 6)

- The Battle Ground Sewage Treatment Plant began operating on May 5, 1975. It uses rotating biological contactors to provide secondary treatment. It was originally designed to meet a population equivalent of 5200, with a load capacity of 892 lb BOD/day.

- A 1978 survey showed a drastic DO depletion problem downstream of the treatment plant. DO levels dropped below 4 mg/l, significantly lower than the 8 mg/l water quality standard. Nitrification (ammonia-oxidation) was found to be the major contributor to the DO problem. During the survey, the nitrogenous oxygen demand (NOD) of the effluent was estimated to be 290 lb/day, corresponding to 63 lb/day of ammonia-nitrogen. The carbonaceous BOD factor was considered to be only 4% of the problem. The NOD was to be controlled by determining an appropriate effluent limit for ammonia-nitrogen to maintain water quality standards.

- **Review notes: Dissolved oxygen depletion is noted as the problem; ammonia-nitrogen levels in the effluent**

are pinpointed as the cause. Although other sources were not identified in the initial documents, a followup study in 1986 (document 9) did look for other sources, and indicated that the treatment plant is the main contributor to the DO problem.

TMDL document - Complete (see Document 2)

- Although no loading capacity for ammonia nitrogen and BOD were determined for Weaver Creek, the TMDL documents clearly define the wasteload allocations for the main source of oxygen demanding substances, the Battle Ground Treatment Plant.

- Ecology specified that the wasteload allocations for the Battle Ground Wastewater Treatment Plant are:

  Ammonia-Nitrogen: 2 lb/day
  BOD_5: 10 lb/day

- The impact of designating these wasteload allocations was to essentially decrease the design capacity of the plant from 0.65 mgd to 0.126 mgd, and reduce the organic load capacity from 892 lb/day BOD to 121 lb/day BOD. By doing this, excess wastewater had to be treated elsewhere. An interceptor is being built to route the wastewater to the Salmon Creek Regional Facility, for ultimate discharge to the Columbia River.

- **Review note: The TMDL document clearly states the wasteload allocations that were determined to be adequate to meet the water quality standard for dissolved oxygen. The technical documents are identified. In addition, the TMDL contains additional information on the implementation strategy (limited sewer hookup moratorium, expansion of the Salmon Creek Regional Wastewater Treatment Plant) that is aimed at maintaining the DO standard.**

Supporting Studies - (see Documents 4, 5, 6, and 8)

- The calculations for the ammonia TMDL are not explicitly developed (they are mentioned in document 8 as having been derived from data in document 4). Document 4 did not go far enough in developing limits to meet the 8 mg/l DO standard; it was aimed more at determining whether additional loads were allowable. Document 6 develops an NOD (100 lb/day, which is equivalent to an ammonia-nitrogen load of 21.9 lb/day) to meet a minimum DO of 4 mg/l. The NOD of 9.1 lb/day, which is equivalent to an ammonia-nitrogen load of 2

lb/day, is not clearly derived in any of the documentation.

- **Review notes: The limit of 2 lb/day ammonia-nitrogen was apparently calculated using the available instream flow, the instream dissolved oxygen standard of 8 mg/l, and reaeration data. The concern over the DO problem led to the NPDES permit limits of 10 lb/day BOD and 2 lb/day ammonia-N.**

Public participation - Complete

- Conducted in accordance with NPDES regulations during the reissuance of the permit in 1981.
- **Review notes: Adequate public participation.**

Enforceability - Complete (see Document 10)

- NPDES Permit No. WA-002093-1, Town of Battle Ground
- **Review notes: enforceable permit and permit conditions. The permit limits led to a reduction in the available capacity of the plant.**

TMDL effectiveness plan - Complete (see Documents 2, 7, 8, and 9)

- Clark County is conducting water quality monitoring on Weaver Creek.
- Ambient studies and inspections that were conducted after the permit was reissued have noted that the DO standard of 8 mg/l is now being met in Weaver Creek. However, fecal coliform problems still exist.
- **Review notes: Adequate monitoring to assess compliance with the TMDL.**

Recommendation, approve TMDL.

ALW, 2/23/93

TOTAL MAXIMUM DAILY LOAD

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 SEGMENT: WA-28-1027

Weaver Creek

(mouth to headwaters at RM 4.3, tributary to Salmon Creek)

RECEIVING SYSTEM INFORMATION:

Basin: Salmon-Washougal
County: Clark

TMDL PARAMETER:

Biochemical Oxygen Demand (5 day)

APPLICABLE RULES:

WAC 173-201-045(2)(c)(ii)(A)

SOURCES COVERED BY THIS TMDL:

Allocation Type	Source Description
WLA	Town of Battle Ground Wastewater Treatment Plant

TMDL:

No loading capacity for 5-day biochemical oxygen demand has been estimated. The WLA for the Town of Battle Ground Wastewater Treatment Plant is set at 10 pounds per day.

Technical Documents:

Prescott, S. 1975. Battle Ground STP Efficiency Study. Memorandum to Gerry Calkins dated September 10, 1975. Washington State Department of Ecology.

Moore, A. and D. Anderson. 1978. Weaver Creek- Battle Ground Sewage Treatment Plant Impact Study. Washington State Department of Ecology, Olympia, WA.

Barton, T.B. 1979. Second Quarter 1979 Water Quality Monitoring Report. Southwest Washington Health District.

Peake, 1. 1980. Determination of Nitrogenous Oxygen Demand for Wooden (Weaver) Creek. Memorandum to Howard Steeley dated June 6, 1980. Clark County Public Works, Vancouver, WA.

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Heffner, M. 1984. Battle Ground Sewage Treatment Plant Class II Inspection and Receiving Water Study, December 6-7, 1983. Memorandum to J. Neel and M. Morhous dated June 8, 1984, Washington State Department of Ecology.

Crawford, P. 1986. Weaver Creek Low-Flow, Point Source Reconnaissance. Memorandum to Jon Neel dated February 3, 1986, Washington State Department of Ecology.

Public Participation:

The permit conditions were subject to a public notice and comment period required by the permit renewal.

Implementation:

In 1975, an ecology study recommended that the Battle Ground wastewater treatment plant be upgraded to reduce loadings to Weaver Creek. In 1980, an extensive review of receiving water data was conducted along with a review of the Battle Ground effluent quality and plant design. In 1981, a new NPDES permit based on water quality was issued. The facility upgrade was completed in 1982.

While these actions have substantially improved the water quality in Weaver Creek, there continues to be problems caused buy multiple point and nonpoint sources within the drainage basin (Crawford, 1986). To help solve this problem, a limited sewer hookup moratorium is in effect for the Battle Ground facility. Currently, the Salmon Creek Regional Wastewater Treatment Plant is being expanded to accept additional loads. An interceptor is under construction that will collect wastewater from the Battle Ground facility and a number of other point sources and septic tanks for treatment at the Salmon Creek Regional facility and discharge to the Columbia river.

Monitoring:

Clark County has conducted monthly water quality monitoring (including dissolved oxygen sampling) at three stations on Weaver Creek since April 1991 and plans to continue monitoring into the foreseable future.