



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

MAR 23 1993

Reply to
Attn of: WD-139



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Publication # 93-10-213

MEMORANDUM

SUBJECT: Recommendation for TMDL Approvals

Little Klickitat River - mouth at Klickitat River RM
19.8 to confluence with East Prong and West Prong RM
25.7 - Waterbody Segment No. WA-30-1020.

TMDL Parameters: Biochemical Oxygen Demand, Total
Residual Chlorine.

FROM: Rob Pedersen, Environmental Engineer
Environmental Characterization Program

TO: File

- TMDLs submitted 25 August 1992
 - TMDL package completed 9 March 1993
 - EPA Approval Checklist
 - Document 1: Transmittal letter
 - Document 2: TMDL document
 - Document 3: Joy, J. 1983. "Little Klickitat River Receiving Water Survey in the Vicinity of Goldendale STP". Memorandum of April 20 to Alan Newman. Washington Department of Ecology, Olympia, WA.
- Joy, J. 1985. "Goldendale Wastewater Treatment Plant/Little Klickitat River Low-Flow Survey Data and Findings". Memorandum of December 11 to Alan Newman. Washington Department of Ecology, Olympia, WA.
- Heffner, M. 1986. "Goldendale Sewage Treatment Plant Class II Inspection, August 27-28, 1985, and March 11-12, 1986." Memorandum of October 30 to

Jim Milton. Washington Department of Ecology,
Olympia, WA.

Joy, J. 1986. "Goldendale Wastewater Treatment
Plant/Little Klickitat River Receiving Water
Survey and Total Maximum Daily Load Evaluation."
Memorandum of October 21 to Jim Milton.
Washington Department of Ecology, Olympia, WA.

- Documents 4a, 4b, 4c: Implementation
documentation, for the city of Goldendale sewage
treatment plant NPDES permit:

Document 4a: Public notice documentation for
the city of Goldendale NPDES permit - see
Document 4c, Fact Sheet, May 1989.

Document 4b: NPDES Permit No. WA-002112-1
city of Goldendale issued June 30, 1989,
expires June 30, 1994.

Document 4c: Fact Sheet for Goldendale WWTP;
hand-dated June, 1989 (true PN date probably
May 1989).

Transmittal letter - Complete (see Document 1)

- States that TMDLs have been established in accordance
with Section 303(d)(1) of the Clean Water Act.
- **Review note: meets requirements.**

Problem Assessment - Complete (see Documents 2 and 3)

- The Little Klickitat is a Class A river. The 280
square mile watershed consists of a range, agricultural
and forest land mixed use; located north of the
Columbia River on the southeast side of Washington's
Cascade mountains. The mean August discharge for the
river is 2.5 cfs. The Little Klickitat section in
question is from its mouth at RM 19.8 of the Klickitat
River to the confluence with the East and West Prong
creeks at RM 25.7.

The city of Goldendale (population 3700) WWTP is
designed for a population of about 6000. Average
discharge is 0.45 cfs (1.44 cfs average for December
through February). To meet dilution requirements, city
well water may be added to the river, upstream. During
very low flow, the city spray irrigates on 87.6 acres.

- Pollution sources are the city of Goldendale's

wastewater treatment plant (WWTP) at RM 14.1 and nonpoint sources. Nutrients and fecal coliform bacteria are the primary nonpoint pollutants - due to livestock access to the river and runoff from pastures, agricultural areas and urban stormwater. Nonpoint pollutant sources were not considered contributors to potential instream oxygen depression nor chlorine toxicity and were not included in the TMDL analysis.

Prior to the WWTP upgrade, water quality issues below Goldendale's outfall included: dissolved oxygen (DO) sag; ammonia and chlorine toxicity; and nutrient enrichment.

- Receiving water studies (Document 3) in October 1981 showed that WWTP effluent had a potentially serious effect on water quality: primarily, localized DO depression; chlorine and ammonia toxicity; and nutrient enrichment. Dilution at the time was 14:1; the current NPDES permit requires a 20:1 dilution. Downstream total residual chlorine (TRC) was 0.1-0.15 mg/l (standard: 0.011 chronic, 0.019 acute). Although DO was just marginally above the standard (averaged 8.4 mg/l), percent saturation was not good; instream saturation was not back to 100 percent until four miles downstream.

A DO sag model considered both the old and new outfall locations and included CBOD, NOD and SOD (for details see Joy, 1983). Downstream DO violations were predicted for the 1981 facility with either outfall location. Other considerations which could compound the DO issue and were not a part of the model: respiration from benthic sources and heavy periphyton growth, and worst case conditions of temperature and ammonia loading.

- Review notes: Problem assessment thoroughly provides background information, identified water quality problems for residual chlorine and high BOD loads from the wastewater treatment plant. The assessment discussed a significant downstream DO sag.

TMDL document - Complete (see Document 2)

- No loading capacities for BOD₅ nor TRC were estimated.
- Although the loading capacity for the TMDL parameters have not been quantified, instream DO and TRC standards were achieved with the WWTP upgrade to a two stage lagoon system (three cells on 36 acres).

The wasteload allocations at a 20:1 dilution (or a mean July through October flow of 8.6 cfs) and for the facility design capacity are:

BOD ₅ lbs/day	64.5	372.6
TRC lbs/day	0.43	2.48

For the current influent loading:

-the above BOD loading represents an approximate 50 percent reduction compared to loadings from the old WWTP;

-TRC loadings, with dechlorination, were reduced by about 7.67 lbs/day.

- The TMDL portion of the Joy (1986) report stated that current permit limits protect water quality. Instream DO depression could occur with WWTP upset, i.e. lagoon algal die-off due to very cold weather or poisoning which could increase nitrogen loading and stimulate instream algal growth.
- Review note: Clearly identifies the wasteload capacity for the TMDLs for chlorine and BOD₅. References the supporting technical documents which give pollutant levels at several ambient stations and the WWTP contributions for both the pre- and post-upgrade. Followup monitoring is not planned.

Supporting Studies - Complete (see Document 3)

- The October 1981 water quality survey documented the pollution problems discussed above. Dilution was only 14:1 compared to the required 20:1, however, temperatures and algal growth activity were undoubtedly depressed over summer conditions.
- The WWTP upgrade was complete by 1984. In August 1985 the city was spray irrigating effluent but discharged effluent and city dilution water to the river for a water quality survey; again, dilution was 14:1. Effluent and instream water quality were greatly improved compared to 1981 survey results.

DO at downstream stations was 9-10.8 mg/l. There was no significant difference in BOD or DO above and below the outfall. TRC was below the detection limit except at one station (dechlorination operations were adjusted accordingly). There was no toxicity due to TRC or ammonia.

Nitrate and total phosphorus were much lower in the

WWTP effluent but instream nutrient levels were still high. Nonpoint sources of nutrients were more evident with the improvement in the WWTP. Nonpoint generated instream bacteria counts were still elevated.

- The March 1986 survey was part of the wet weather/dry weather Class II inspection and is not at part of TMDL low flow evaluations.
- Review notes: Documentation gives a thorough analysis of downstream effects from treated effluent for both the pre- and post-WWTP upgrade. Results from the 1985 survey showed the WWTP effluent appeared to have only minor effects on water quality and that DO and TRC standards were maintained.

Public participation - Complete (see Documents 4c)

- Public notice for city of Goldendale's NPDES permit (notice issued with draft permit, spring 1989).
- Review notes: Adequate public notice for permit reissuance and for new WWTP upgrade; TMDL proposals were not the primary purpose of the public notice.

Enforceability - Complete (see Document 4b)

- NPDES Permit No. WA-00-2112-1, city of Goldendale, issued 30 June, 1989.
- Review notes: Valid permit and supporting documentation.

TMDL effectiveness plan - Complete (see Documents 2, 4a and 4b)

- The NPDES permit limitations and monitoring requirements will ensure that DO and TRC standards will be maintained in the Little Klickitat River.
- Review notes: Adequate WWTP monitoring to assess compliance with the TMDLs. No ambient monitoring is planned to assess changes in nonpoint pollutant loads.

Additional Information

- The Goldendale NPDES permit has a minimum dilution requirement of 20:1 (or five percent of the mixed downstream flow volume) from 1 May to 30 October. As mentioned above, city well water is pumped into the Little Klickitat River upstream of the outfall. Well water meets Class A water quality standards. The primary concern is the concentration of salts in the

well water since the downstream water rights are for agricultural purposes.

- The NPDES permit limit for TRC is 0.2 mg/l (with minimum instream dilution, TRC would be less than or equal to 0.011 mg/l). Dechlorination is achieved with sulfur dioxide; a measured TRC in the effluent must be maintained to ensure zero sulfite oxygen demand.
- Review notes: No information was provided about water quality conditions further upstream or downstream of Goldendale. Based on data collected in the vicinity of Goldendale, nonpoint pollution sources are not expected to cause instream DO violations. However, when Ecology personnel perform an inspection of Goldendale's WWTP, EPA recommends measuring DO and percent saturation in the Little Klickitat River beyond the old survey bounds, i.e. around RM 5 and RM 18.

Recommendation, approve TMDLs.

ERP, 03/10/93

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

WATERBODY SEGMENT: WA-30-1020

Little Klickitat River

(mouth at Klickitat RM 19.8 to
confluence of the East Prong
and the West Prong at RM 25.7)

RECEIVING SYSTEM INFORMATION:

Basin: Klickitat
County: Klickitat

TMDL PARAMETER:

Biochemical Oxygen Demand (5 day)

APPLICABLE RULES:

WAC 173-201-045(1)(c)(ii)(A)

SOURCES COVERED BY THIS TMDL:

Allocation

<u>Type</u>	<u>Source Description</u>
WLA	City of Goldendale Wastewater Treatment Plant

TMDL:

No loading capacity for 5-day biochemical oxygen demand has been estimated. The permit conditions for the City of Goldendale Wastewater Treatment Plant require a minimum dilution ratio of 20:1. With this requirement, the WLA would be 64.8 pounds per day using the mean upstream flow for the period of July through October of 8.6 cfs and a WLA of 372.6 pounds per day at the facility design capacity.

Technical Documents:

- Joy, J. 1983. Little Klickitat River Receiving Water Survey in the Vicinity of goldendale STP. Memorandum to Alan Newman dated April 20, 1983. Washington State Department of Ecology.
- Joy, J. 1985. Goldendale Wastewater Treatment Plant/Little Klickitat River Low-Flow Survey Data and Findings. Memorandum to Al Newman dated December 11, 1985. Washington State Department of Ecology.
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- Joy, J. 1986. Goldendale Wastewater Treatment Plant/Little Klickitat River Receiving Water Studies and Total Maximum Daily Load Evaluation. Memorandum to Jim Milton dated October 21, 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:

The NPDES permit was modified to allow a discharge flow that meets the minimum dilution requirement of 20 to 1. The dilution requirement can be achieved by the discharge of clean city water upstream of the treatment facility. If the dilution cannot be achieved the wastewater is spray irrigated. In 1982, the facility replaced a trickling filter with a two-stage lagoon system resulting in a 50% reduction in effluent BOD concentration.

Monitoring:

No ambient monitoring of the Little Klickitat River is currently conducted or planned.