Jim Bloom

TMDL - YAMHILL
- Corvallis
2300 N.W. Walnut Blvd
PO Box 428 97339
Mike Gallagher

NEIL GOLDSCHMIDT
GOVERNOR

Environmental Quality Commission

811 SW SIXTH AVENUE, PORTLAND, OR 97204 PHONE (503) 229-5696

REQUEST FOR EQC ACTION

Meeting Date: June 3, 1989
Agenda Item: L
Division: Water Quality
Section: Planning/Monitoring

SUBJECT:

Total Maximum Daily Loads (TMDLs) for the Yamhill River - Establishment of Instream Total Phosphorus Criteria for the Yamhill, South Yamhill, and North Yamhill Rivers.

PURPOSE:

To provide the basis for establishing the total maximum daily load (TMDL), waste load allocations (WLA), and load allocations (LA) for phosphorus in the Yamhill Basin by defining the assimilative capacity of the Yamhill River for nutrient loads.

ACTION REQUESTED:

__ Work Session Discussion
  __ General Program Background
  __ Potential Strategy, Policy, or Rules
  __ Agenda Item __ for Current Meeting
  __ Other: (specify)
__ Authorize Rulemaking Hearing
X Adopt Rules
  Proposed Rules — Attachment A
  Rulemaking Statements — Attachment B
  Fiscal and Economic Impact Statement — Attachment C
  Public Notice — Attachment D
__ Issue a Contested Case Order
__ Approve a Stipulated Order
__ Enter an Order
  Proposed Order — Attachment ___
__ Approve Department Recommendation
  __ Variance Request — Attachment ___
  __ Exception to Rule — Attachment ___
  __ Informational Report — Attachment ___
  __ Other: (specify) — Attachment ___

DESCRIPTION OF REQUESTED ACTION:

The proposed rule would:

1. Identify the assimilative capacity of the Yamhill River for nutrient loads.

2. Establish instream criteria for total phosphorus. These criteria will form the basis for allocating phosphorus loads in the Yamhill basin.

3. Define the time frame for the Department to publish interim allocations derived from the criteria established in the rule. Interim allocations will be used to develop and review program plans.

4. Define the time frame for point sources which discharge during the summer low flow in the Yamhill Basin to develop and submit to the Department program plans which describe strategies and options for achieving specified phosphorus load limits.

AUTHORITY/NEED FOR ACTION:

_X_ Required by Statute: ORS 468.735 — Attachment B
Enactment Date: _____
___ Statutory Authority: _____ — Attachment ___
___ Pursuant to Rule: _____ — Attachment ___
___ Pursuant to Federal Law/Rule: _____ — Attachment ___

_X_ Other:

Implement Public Law 92-500 as amended, specifically Section 303 — Attachment B

Federal District Court Consent Decree Civil No. 86-1578-B — Attachment E

_X_ Time Constraints:

The Department is required to establish TMDLs on water quality limited streams at the rate of 20 percent annually, but in no event less than two stream segments annually. Allocations must be established on the Yamhill River to comply with the requirements stated in the consent decree. Oregon's failure to establish allocations will require the Environmental Protection Agency to promulgate action within 90 days after the deadline.

DEVELOPMENTAL BACKGROUND:

__	Advisory Committee Report/Recommendation	Attachment ___
_X_	Hearing Officer's Report/Recommendations	Attachment _F_
_X_	Response to Testimony/Comments	Attachment _F_
__	Prior EQC Agenda Items:	Attachment ___
__	Other Related Reports/Rules/Statutes:	Attachment ___
_X_	Supplemental Background Information	Attachment _G_

The Federal Clean Water Act under Section 303 requires the establishment of total maximum daily loads for streams that do not achieve water quality standards even after the application of technology-based effluents limitations. For municipal treatment plants technology based effluent limitations are defined as standard secondary treatment. The establishment of a total maximum daily load requires a technical evaluation of a receiving water's assimilative capacity. This capacity is then distributed to the various point source discharges as waste load allocations (WLAs), and to nonpoint source, and background as load allocations (LAs). Once the loads are established, it is possible then to identify and review options for protecting the receiving water's beneficial uses.

On August 24, 1987, the Department issued a public notice proposing a flow-based TMDL for the Yamhill River. Following the public notice period, the Department summarized and responded to the comments received. In May of 1988, the Department began intensive sampling to define pollution sources and water quality in the Yamhill Basin. Results for the sampling were used to refine the proposed TMDL, and to propose waste load and load allocations. A public hearing on the proposed rule was held in McMinnville on April 26, 1989. No controversial issues were raised during the public hearing. The hearings officer's report summarizes and responds to the testimony received (Attachment F).

REGULATED/AFFECTED COMMUNITY CONSTRAINTS/CONSIDERATIONS:

The proposed rule will:

Establish criteria which will be used to define WLAs for the communities of Carlton, McMinnville and Lafayette.

The proposed WLA for Carlton provides design criteria to assure that effluent from the new wastewater treatment plant will not violate water quality standards.

Achieving the proposed WLA for McMinnville would require reducing existing loads by as much as 90 percent during

summer low flow. Several options exist for achieving the WLA and these need to be assessed relative to cost and time frame for implementation.

The WLA for Lafayette will require reductions in phosphorus load during summer low flow conditions. The level of reduction may depend on options selected by upstream dischargers.

The City of Yamhill requested that the Department hold in reserve an allocation for potential discharge by the City in the future. The proposed allocations provide the requested reserve. The Department proposes to hold reserve for future growth and development but not specifically for the City of Yamhill.

Required program plans describing strategies, available options, time frames, and costs of achieving specific WLAs are to be submitted to the Department by the communities of McMinnville and Lafayette. Evaluation of options and selection of control strategies will follow the Department's review of the program plans. Review of the program plans may result in modifications to the WLAs.

Establish the LA at existing loads with a reserve dedicated to the Department for future growth and development. An additional reserve has been allocated to the North Fork in response to the request by the City of Yamhill. No immediate impacts are expected from establishing LAs. Future growth, development, and discharges may require limitations to stay within the allocated load and reserves.

PROGRAM CONSIDERATIONS:

New tasks established by the proposed rule have been programmed to be handled by existing staff. The added workload is not as significant as that caused by the TMDL on the Tualatin River but will require shifting of priorities and postponing or delays on other required work. New tasks include development of interim TMDLs, program plan review, and continuing proactive involvement with the communities in the Yamhill Basin.

ALTERNATIVES CONSIDERED BY THE DEPARTMENT:

1. Adopt the proposed rule as written.

Adoption of the proposed rule will provide the framework and time frames for establishing the TMDL with associated WLAs and LAs in the Yamhill basin. The Department identified

three alternatives in the previous staff report. However, no modifications to the recommended proposed rule were suggested during the comment period and the comments which were received supported the proposed rule.

DEPARTMENT RECOMMENDATION FOR ACTION, WITH RATIONALE:

The Department recommends that the Commission adopt the proposed rule as written.

The Department is required to establish total maximum daily loads for the Yamhill River. The time frame for developing TMDLs is defined in the Environmental Protection Agency (EPA) - Northwest Environmental Defense Center (NEDC) consent decree. Within 90 days of Department inaction, the Environmental Protection Agency is required to develop TMDLs.

CONSISTENCY WITH STRATEGIC PLAN, AGENCY POLICY, LEGISLATIVE POLICY:

1. The proposed rule is consistent with the approach for establishing TMDLs on water quality limited stream segments identified in the Environmental Quality Commission Agenda Item O, March 13, 1987.

2. The establishment of phosphorus criteria is needed to improve the water quality of the Yamhill River to protect the recognized beneficial uses of Resident Fish and Aquatic Life, Water Contact Recreation, and Aesthetic Quality. Achieving the phosphorus criteria will prevent nuisance aquatic growth of algae. The Yamhill River is water quality limited due to pH violations resulting from nuisance algal growths. The nuisance algal growths are the result of excessive nutrient loadings. The primary source of nutrients in the Yamhill are the municipal sewage treatment plants.

3. The Federal Clean Water Act, under Section 303, requires that pollution limits termed Total Maximum Daily Loads be established in waters that do not meet standards, in either numerical or narrative form, even after technology-based limitations have been applied.

4. In December 1986, the Northwest Environmental Defense Center filed suit in the Federal District Court against the Environmental Protection Agency to ensure that total maximum daily loads would be established and implemented for waters in Oregon identified as being water quality limited. On June 3, 1987, Federal Judge James Burns signed a consent decree between NEDC and EPA describing a schedule for establishing TMDLS in Oregon. The Yamhill River was one of

eleven waterbodies identified in the Consent Decree. In March 1987, the Environmental Quality Commission approved the Department's proposal and schedule for establishing TMDLs on water quality limited streams.

ISSUES FOR COMMISSION TO RESOLVE:

Whether or not to establish instream criteria for phosphorus in the Yamhill River and requirements for establishing TMDLs and the development of program plans in rule form.

INTENDED FOLLOWUP ACTIONS:

Distribute initial allocations for the development of program plans.

Review program plans and return to the Commission for approval.

Approved:

Section: _____

Division: _____

Director: _____

Report Prepared By: Robert Baumgartner

Phone: 229-5877

Date Prepared: May 3, 1989

RPB:kjc
PM\WJ1840
May 17, 1989

June 3, 1989 ?

SPECIAL POLICIES AND GUIDELINES

340-41-470

(4) In order to improve water quality within the Yamhill River subbasin to meet the existing water quality standard for pH, the following special rules for total maximum daily loads, waste load allocations, load allocations and program plans are established.

(a) After completion of wastewater control facilities and program plans approved by the Commission under this rule and no later than June 30, 1994, no activities shall be allowed and no wastewater shall be discharged to the Yamhill River or its tributaries without the authorization of the Commission that cause the monthly median concentration of total phosphorus to exceed 70 ug/l as measured during the low flow period between approximately May 1 and October 31* of each year.

* Precise dates for complying with this rule may be conditioned on physical conditions (i.e., flow, temperature) of the receiving water and shall be specified in individual permits or memorandums of understanding issued by the Department. The Department shall consider system design flows, river travel times, and other relevant information when establishing the specific conditions to be inserted in the permits or memorandums of understanding.

(b) Within 90 days of adoption of these rules, the Cities of McMinnville and Lafayette shall submit a program plan and time schedule to the Department describing how and when they will modify their sewerage facility to comply with this rule.

(c) Final program plans shall be reviewed and approved by the Commission. The Commission may define alternative compliance dates as program plans are approved. All proposed final program plans shall be subject to public hearing prior to consideration for approval by the Commission.

(d) The Department shall within 60 days of adoption of these rules distribute initial waste load allocations and load allocations to the point and nonpoint sources in the basin. These allocations shall be considered interim and may be redistributed based upon the conclusions of the approved program plans.

STATEMENT OF NEED FOR RULEMAKING

Pursuant to ORS 183.335(7), this statement provides information on the Environmental Quality Commission's intended action to adopt and amend rules.

(1) Legal Authority

ORS 468.735 provides that the Commission by rule may establish standards of quality and purity for waters of the state in accordance with the public policy set forth in ORS 468.710. ORS 183.545 requires a review every three years of state agency Administrative Rules to minimize the economic effect these rules may have on businesses. ORS 183.550 requires, among other factors, that public comments be considered in the review and evaluation of these rules. The Clean Water Act (Public Law 92-500, as amended) requires the states to hold public hearings, at least once every three years, to review applicable water quality standards. Section 303 of the Act further requires that Total Maximum Daily Loads be established for water quality limited stream segments.

(2) Need for the Rule

The Environmental Quality Commission, at its meeting on March 13, 1987, approved the process identified by the Department for establishing Total Maximum Daily Loads (TMDLs), including the proposed schedule for completing Phase I of the process for ten stream segments and one lake. To start the process, the Commission concurred with the Department's intent to place the Tualatin River TMDLs on 30-day notice for public review and comment, thus initiating the entire TMDL/WLA (Waste Load Allocation) process for the Yamhill River.

(3) Principal Documents Relied Upon in this Rulemaking

Clean Water Act as amended in 1977.

Quality Criteria for Water, 1986. EPA.

Code of Federal Regulations, 1987 (40 CFR) Part 130 - Water Quality Planning and Management.

State/EPA Agreement, July 1987. Program Document for FY 1988.

FISCAL AND ECONOMIC IMPACT STATEMENT

Overall Impact

Adoption and implementation of the proposed amendments to water quality standards in the Yamhill Basin will result in increased costs for wastewater treatment and control. These increased costs will be limited to communities which treat municipal wastes and discharge effluent to basin streams. The proposed rules do not allocate loads, below existing conditions, to nonpoint waste sources and they do not allocate waste loads to industries. Consequently, neither industries nor nonpoint waste sources (primarily forest harvesting and agricultural operations) will experience fiscal impacts. Communities with municipal treatment facilities will receive specified waste load allocations: to the extent that these allocations require substantial and expensive improvements to treatment capability, there will be significant fiscal impacts.

The actual fiscal impacts to communities cannot be described at this time because cost information is not available. The rules will, if adopted, establish compliance dates for municipalities to submit implementation plans and schedules. When this information is available, the Department can assign monetary values to the impacts.

Although cost information is not available, it is possible to ascertain who may incur fiscal impacts, how they may be impacted, and where the impacts may occur. Local governments may be directly impacted. If capitol investment is required, they will have to secure cash from bond sales or from loans. Operating expenses may increase to cover operation and maintenance of new facilities. Sewerage system users may be indirectly impacted. Local governments may have to increase user charges to pay off the bonds and/or loans - system users would have to pay the increased charges. These users include homeowners, small business, and large business. If business operating expenses increase, the public may be indirectly impacted through increased product prices. Property owners could also be indirectly impacted through property tax increases if operating expenses increase for public institutions such as schools. Table 1 presents a summary of possible fiscal and economic impacts which could result from waste load allocations to Yamhill Basin streams. Once cost information is available, these possible impacts will be evaluated.

TABLE 1

SUMMARY OF POSSIBLE FISCAL IMPACTS--YAMHILL BASIN
WHO IS IMPACTED? HOW ARE THEY IMPACTED? WHERE ARE THEY IMPACTED?

Local Government	Bond sale or loan-Direct	Cash Outlays-1 time
	Operating Expenses-Direct	Cash Outlays-Ongoing
General Public	Rate Increases-Indirect	Cash Outlays-Ongoing
	Price Increases-Indirect	Cash Outlays-Ongoing
	Tax Increases-Indirect	Cash Outlays-Annual
Small Business	Rate Increases-Indirect	Cash Outlays-Ongoing
	Increased Operating Expenses-Indirect	Cash Outlays-Ongoing
	Tax Increases-Indirect	Cash Outlays-Annual
Large Businesses	Rate Increases-Indirect	Cash Outlays-Ongoing
	Increased Operating Expenses-Indirect	Cash Outlays-Ongoing
	Tax Increases-Indirect	Cash Outlays-Annual

Probable Community Impacts

Probable fiscal impacts are presented below for five communities which may receive waste load allocations.

Cove Orchard. This community treats domestic wastes with a gravel filter and drainfield. The treatment system has failed. The EPA will provide a 100% grant to improve treatment capability necessary to meet treatment requirements and water quality standards. No increases in operating expenses are anticipated. There shouldn't be any fiscal impacts.

Yamhill. The waste load allocation to this community is a requested reserve. Treatment facility upgrade will probably not be necessary. There shouldn't be any fiscal impacts.

Carlton. This community is currently preparing a facility plan to upgrade treatment capability necessary to meet permit conditions and Yamhill Basin treatment requirements, and to eliminate compliance problems. Although the analysis is not complete, the facility plan will probably recommend summer holding and spray irrigation of effluent. If this is the case, the waste load allocation to Carlton will not result in increased treatment beyond what will be necessary to meet permit conditions and Basin treatment requirements. Subject to completion of the required facility plan, Carlton should be receiving a federal construction grant, scheduled for summer 1989. This grant will pay about 50% of capital construction costs. The waste load allocation should not result in significant fiscal impacts.

Lafayette. The implementation of a waste load allocation for Lafayette may require treatment facility upgrade and probably summer holding. This could be expensive. The community would be eligible for low interest loans (3%) from the State Revolving Fund. The waste load allocation will probably result in significant fiscal impacts.

McMinnville. McMinnville is the major source of nutrients to the South Yamhill River. The waste load allocation to this community will require substantial facility improvements. Possible alternatives to meet the allocation include summer holding and/or spray irrigation, and advanced waste treatment. The city is now initiating a study to evaluate treatment options, and capital and operating costs. The waste load allocations will probably result in significant fiscal impacts to the community and ratepayers. McMinnville would be eligible for low interest loans from the State Revolving Fund.

(5) Land Use Consistency

The Department has concluded that the proposal conforms with the statewide planning goals and guidelines.

Goal 6 (Air, Water, and Land Resources Quality):

This proposal is designed to improve and maintain water quality in the Yamhill River and achieve the pH standard by reducing the phosphorus loadings which supports nuisance algal blooms during the summer.

Goal 11 (Public Facilities):

Compliance with these proposed rules, if adopted, would require the Cities of McMinnville and Lafayette to provide program plans describing strategies for achieving phosphorus limits. Compliance with these proposed rules, if adopted, would require these cities to provide addition sewerage facilities.

The proposed rules do not appear to conflict with other goals.

Public comment on any land use involved is welcome and may be submitted in the same manner as indicated for testimony in this notice. It is requested that local, state, and federal agencies review the proposed action and comment on possible conflicts with their program affecting land use and with Statewide Planning goals within their expertise and jurisdiction.

The Department of Environmental Quality intends to ask the Department of Land Conservation and Development to mediate any appropriate conflicts brought to our attention by local, state and federal authorities.

Bob Baumgartner:crw
229-6978
WC4466
2/3/89

Oregon Department of Environmental Quality

A CHANCE TO COMMENT ON...

PHOSPHORUS CRITERIA for the YAMHILL RIVER BASIN
TMDLs for total Phosphorus in the Yamhill

Date Prepared:
Notice Issued:
Comments Due:

WHO IS AFFECTED: All businesses, residents, industries, and local governments within the Yamhill River drainage basin.

WHAT IS PROPOSED: The Department proposes to add the attached language to the special policies and guidelines contained in Oregon Administrative Rules (OAR) Chapter 340, Division 41:-470(4). The proposed language establishes instream phosphorus criteria for the Yamhill, North Yamhill, and South Yamhill Rivers and defines the time period for when the criteria will apply.

The proposed rule will require the Cities of McMinnville and Lafayette to submit program plans to the Department describing a strategy for reviewing and selecting options for achieving phosphorus discharge requirements

WHAT ARE THE HIGHLIGHTS: The Federal Clean Water Act, under section 303, requires that pollution limits known as total maximum daily loads be established on streams that are not achieving water quality standards in either numerical or narrative form. The Yamhill River routinely exceeds the pH standard during summer low flow. The pH violations result from nuisance algal growth which is supported by excessive nutrient concentrations.

The Department believes that phosphorus is the key nutrient supporting the excess algal growths. The proposed rule establishes the instream phosphorus level necessary to prevent the pH standard from being exceeded. The proposed criteria will form the structure for establishing the total maximum daily load, load allocations and waste load allocations. The waste load allocations will define the allowable levels of phosphorus that may be discharged from specified point sources. The load allocations establish the amount of phosphorus that is derived from background and nonpoint sources.

811 S.W. 6th Avenue
Portland, OR 97204

FOR FURTHER INFORMATION:

Contact the person or division identified in the public notice by calling 229-5696 in the Portland area. To avoid long distance charges from other parts of the state, call 1-800-452-4011.

11/1/86

The Department will accept public comment on the proposed additions and amendments to the special policies and guidelines contained in OAR 340-41-470(4). The proposed language for additions and amendments is attached.

HOW TO COMMENT:

Public hearings to receive comments on the proposed additions additions and amendments to OAR 340-41-470(4) as follows:

When: Where:

The Department will accept written comments received by 9:00 P.M _____, _____, 1989. Comments should be addressed to:

Mr. Robert Baumgartner
Department of Environmental Quality
811 SW 6th Ave.
Portland OR 97204

WC4467

ATTACHMENT E

Rech S. Ginsberg, Attorney
United States Department of Justice,
Land and Natural Resources Division
Environmental Defense Section
P.O. Box
Washington, D.C. 20026-3986
(202) 633-2689

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF OREGON

NORTHWEST ENVIRONMENTAL DEFENSE CENTER (NEDC), and JOHN R. CHURCHILL,

Plaintiffs,

v.

LEE THOMAS, in his official capacity as Administrator of the Environmental Protection Agency,

Defendant.

Civil No. 86-1578-BU

CONSENT DECREE

WHEREAS, on December 12, 1986, the Northwest Environmental Defense Center ("NEDC") filed a complaint, as amended on March 20, 1987 in the above-captioned case against Lee Thomas, in his official capacity as Administrator of the Environmental Protection Agency ("EPA");

WHEREAS, NEDC alleges that EPA has violated sections 303 and 505 of the Clean Water Act ("CWA") by failing to perform certain mandatory duties, and EPA denies all liability under the CWA, the Administrative Procedure Act ("APA"), or common law;

WHEREAS, by entering into this decree, EPA in no way agrees with NEDC's allegations that Oregon's failure to make the requisite submissions under CWA section 303 constitutes a "constructive submission" that no submissions are necessary, and that EPA had subsequently issued a constructive approval of the same,

WHEREAS, it is the intent of EPA to see that the goals set forth under CWA section 303 are accomplished, including the designation of water quality limited segments ("WQLS") and the establishment of total maximum daily loads ("TMDL"), including both waste load allocations ("WLA") and load allocations ("LA");

WHEREAS, the parties agree that in accordance with the statutory intent of the CWA, the primary responsibility for accomplishing the goals under section 303 lies with the States;

WHEREAS, the State of Oregon and EPA will annually incorporate elements of this agreement into the State's comprehensive water quality program through the State/EPA ("SEA") negotiation process;

WHEREAS, EPA will not award CWA funds to Oregon for the development of TMDLs, including WLA's and LAs if the elements of this agreement are not identified in the SEA;

WHEREAS, promulgation of the TMDL/WLA/LA constitutes "new information" and EPA understands that it is the intent of the State of Oregon to modify, N.P.D.E.S. permits on the basis of the respective permit reopener clauses and 40 C.F.R. § 122.62(a)(

WHEREAS, the parties wish to resolve this action without litigation, and have, therefore, agreed to entry of this Consent Decree, without the admission or adjudication of any issue of fact or law.

NOW, THEREFORE, it is hereby ordered, adjudged, and decreed as follows:

1. The Court has jurisdiction over this matter and the parties to the decree.

2. That the following terms shall have the meanings provided below:

A. "EPA" means the United States Environmental Protection Agency.

B. "NEDC" means the Northwest Environmental Defense Center.

C. "Loading Capacity" is that which is defined at 40 C.F.R. § 130.2(e).

D. "Water Quality Limited Segments" ("WQLS") is which is defined at 40 C.F.R. § 130.2(j).

E. "Total Maximum Daily Loads" is that which is defined at 40 C.F.R. § 130.2(h).

F. "State/EPA Agreement" is that which is defined at 40 C.F.R. 122.2.

G. Waste load allocation ("WLA") is that which is defined at 40 C.F.R. § 130.2(g)

H. Load allocation ("LA") is that which is defined at 40 C.F.R § 130.2(f).

I. "New Information" is that which is defined at 40 C.F.R. § 122.62(a)(2).

3. That in accordance with the current State/EPA agreement, the State of Oregon has lead responsibility for the designation of Water Quality Limited Segments and the promulgation of Total Maximum Daily Loads pursuant to CWA section 303, 33 U.S.C. § 1313.

4. ~~This~~, in the event the State of Oregon fails to undertake the following regulatory actions according to the schedule set out below, EPA will notice in the federal register proposed agency action in accordance with 33 U.S.C. § 1313(d)(2) no later than ninety days following Oregon's inaction. The regulatory actions and the dates by which they will be completed by the State of Oregon are as follows:

A. submission of the loading capacity as defined at 40 C.F.R. § 130.2(e) for the following Water Quality Limited Segments as set forth below:

Water Body	Date
Tualatin River	5/87
Yamhill River	8/87
Bear Creek	11/87
South Umpqua River	11/87
Coquille River	2/88
Pudding River	2/88
Garrison Lake	2/86
Klamath River	4/88
Umatilla River	4/88
Calapooia River	6/88
Grande Ronde River	6/88

B. adoption of TMDLs WLA's/LA's on those WQLS which are identified in paragraph A and subsequent listings of WQLS provided by the State of Oregon in water quality reports prepared in accordance with CWA section 305(b), at the rate of 20% annually, but in no event less than 2 annually.

C. determination by August, 1988 as to whether the remaining water bodies listed in the plaintiffs' second notice letter of intent to sue dated January 6, 1987, and not identified in EPA's approval on February 20, 1987, of Oregon's January 5, 1987 submission to EPA of Water Quality Limited Segments, are water quality limited.

5. That EPA understands that it is the intent of the State of Oregon to initiate modification of the Rock Creek N.P.D.E.S. permit on the basis of the permit reopener clause and 40 C.F.R. § 122.62(a)(2) within 90 days of promulgation of the phosphorus TMDL/WLA/LA for the Tualatin River.

6. That, it is the intent of the State of Oregon and EPA to reevaluate, in accordance with CWA § 305(b), the waters of the State of Oregon under CWA § 303(d).

7. That defendant will pay plaintiffs reasonable costs, including attorney's fees, incurred to date.

8. That this consent decree will expire upon completion of the obligations set forth in paragraph 4 as to the waters identified in subsections (a) and (c) of paragraph 4.

IT IS SO ORDERED.

6-3-87 James M. Burns

JAMES M. BURNS
UNITED STATES DISTRICT JUDGE

Plaintiffs and Defendant consent to the entry of this Consent Decree without further notice or hearing.

Respectfully submitted,

NORTHWEST ENVIRONMENTAL DEFENSE CENTER and JOHN R. CHURCHILL
Plaintiffs

LEE THOMAS, ADMINISTRATOR
U.S. Environmental Protection Agency
Defendant

By: _____
JEFFREY A. STRANG
5525 SW Kelly Avenue
Portland, OR 97201
(503) 245-7641

By: _____
KARL G. ANUTA
721 S.W. Oak
Portland, OR 97205
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By: _____
BETH S. GINSBERG, Attorney
U.S. Department of Justice
Land & Natural Resources Div.
Environmental Defense Section
P.O. Box 23986
Washington, D.C. 20026-3986
(202) 633-2689

By: _____
MONICA KIRK
U.S. Environmental Protection
Region X, Office of Regional
Counsel
100 Sixth Avenue
Seattle, WA 98101
(206) 442-1505

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY INTEROFFICE MEMO

TO: Environmental Quality Commission DATE: May 5, 1989

FROM: Neil Mullane

SUBJECT: Hearings Officer's Report on the Proposed Rule OAR 340-41-470(4), Establishing an Instream Total Phosphorus Criteria for the Yamhill, South Yamhill, and North Yamhill Rivers

A public hearing was held on April 26, 1989 at the Community Center in McMinnville to receive written and oral testimony on the above proposed rule. Approximately 30 people attended the hearing. Two people presented testimony, one of those individuals, representing the City of McMinnville also submitted written testimony. The Department also received one additional piece of written testimony after the submitted deadline which is included in this report.

Summary of Comments

Robert Morris, a property owner along the river, testified that he felt efforts should be made to keep more water in the river. He felt a lack of water contributed greatly to the problems.

Don Schut, City of McMinnville, summarized written testimony which he submitted and which is attached. McMinnville supports the proposed rule. They are pleased with the revised date of 1994, although it will still be very difficult to achieve in their mind, they felt it is more reasonable. The City also felt that it was really important for the Commission to keep the flexibility to revise dates and time frames.

Robert Burd, U.S. Environmental Protection Agency, submitted written comments, received late, but attached to this report, which supports both the phosphorus criteria and implementation program.

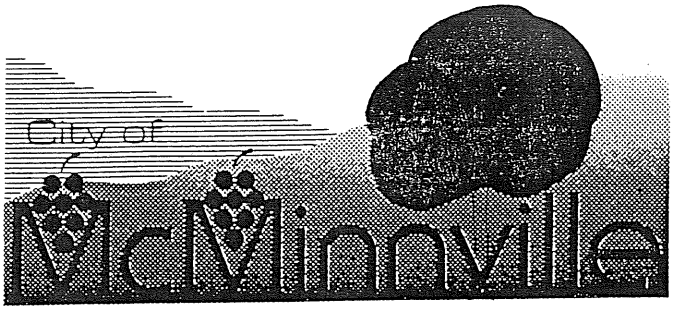
Response to Comment

No comments were received suggesting modifications to the proposed rule.

Recommendation

As Hearings Officer, I recommend adoption of the OAR 340-41-470(4) as proposed.

Mcminnville Hearing
4/20/89
Neil J Mullane
NOM



230 East Second Street • McMinnville, Oregon 97128 • 503-472-9371

April 26, 1989

Mr. Robert Baumgartner
Department of Environmental Quality
Willamette Valley Region
895 Summer Street NE
Salem, Oregon 97310

Re: Yamhill River Drainage Basin

Dear Mr. Baumgartner:

The City has presented a rough draft of time schedules to bring the McMinnville Wastewater Facility into compliance with the revised discharge limits at previous informal meetings. The two alternatives reviewed (attached) require three to three and one-half years to complete. Several assumptions were used in developing these time schedules. These include:

1. No formal facility plan is required.
2. No legal challenges filed.
3. Land use requirements are met.
4. No coordination with the long term alternatives.

The starting point of each of the time schedules assumes approval of a program plan by the Environmental Quality Commission. The development of a partially approved Program Plan for Washington County has already used up nine to ten months of their five-year compliance schedule. DEQ and EQC approval and hearings processes can use up considerable time and have not been included in the time schedule to reflect the length of delays seen in Washington County.

The proposed June 30, 1994 compliance date for the City of McMinnville is not going to be easily met. Many variables exist on the assumptions listed that could significantly extend the approval and construction times.

The City has not reviewed the numerical standards that are the basis for the proposed discharge limits for the wastewater treatment plant. We are assuming that the DEQ staff has done the water quality analysis as

required by the Clean Water Act and have proposed valid standards. We are not in a position to comment on these standards and, therefore, take no responsibility for the level of water quality improvements that may or may not be achieved in the Yamhill River Basin when they are met.

We are pleased that DEQ staff has changed the recommended compliance date from the original proposal. We are also pleased that the Commission will review the compliance date during the Program Plan approval process. Until a plan is developed and approved, we are all guessing on the implementation time schedules. We think that it is important that the EQC retain flexibility in setting the compliance dates and that the long-term solutions be reviewed along with the short-term needs.

Sincerely,

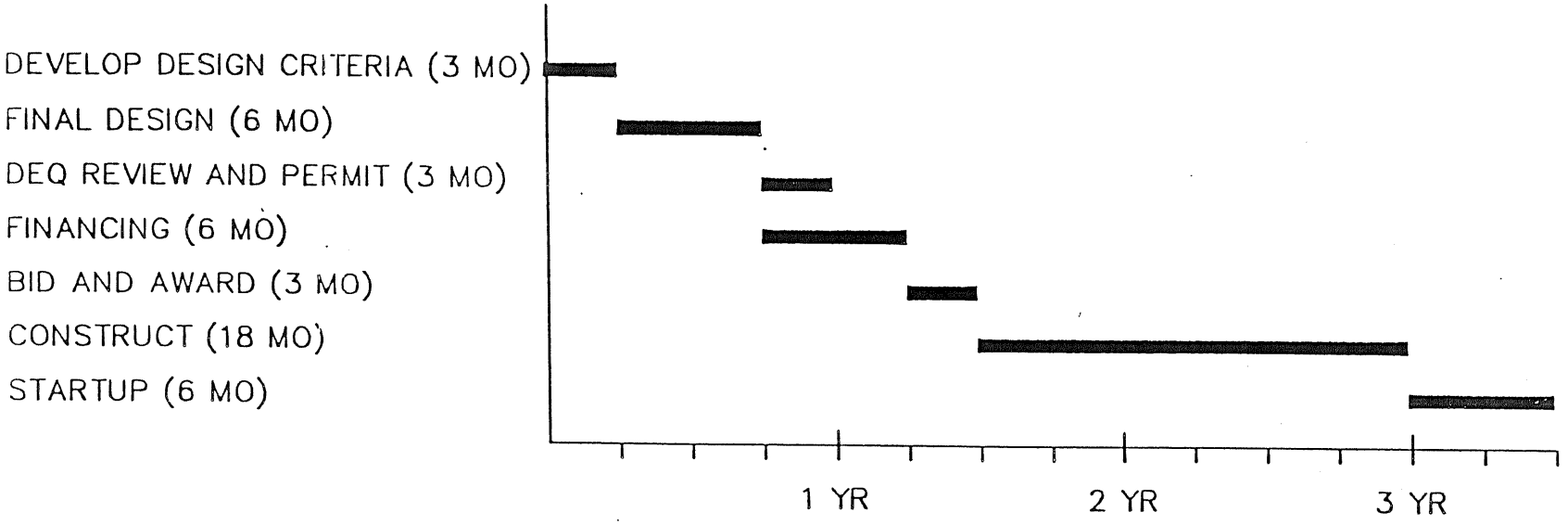
Donald E. Schut

Donald E. Schut
Director of Public Works

DES:llp
Enclosure

FACILITIES:
SECONDARY EFFLUENT PUMPING
TERTIARY CLARIFIERS
FILTERS
CHEMICAL HANDLING AND FEED
SOLIDS PROCESSING

ASSUMES:
* NO FORMAL FACILITIES PLAN
* EXISTING SITE SUITABLE FOR NEW FACILITIES
* NO COORDINATION WITH LONG TERM ALTERNATIVE



ADVANCED WASTEWATER TREATMENT

Mc MINNVILLE STP

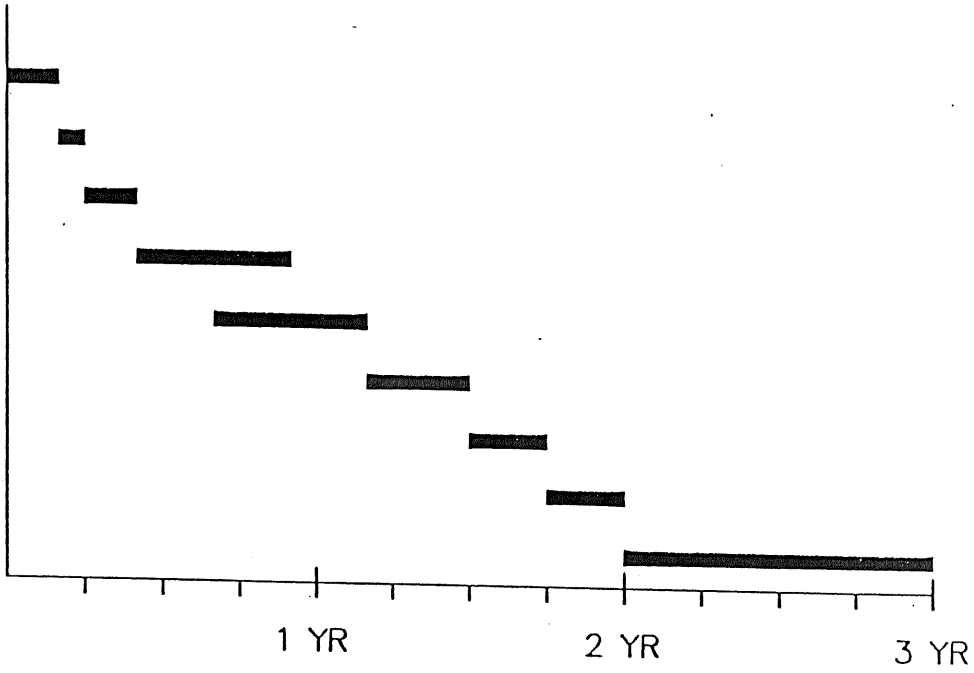
CH2MHILL

H:\73PROJ\PDX812.73\FIG1.DWG

60 DAYS STORAGE → ±50 ACRES
IRRIGATION → ±500 ACRES

ASSUMES:
* NO FORMAL FACILITIES PLAN
* NO LEGAL CHALLENGES
* LAND USE, AND OTHER PLANNING REQUIREMENTS SATISFIED
* NO COORDINATION WITH LONG TERM ALTERNATIVE

DEVELOP DESIGN CRITERIA (2 MO)
LOCATE SUITABLE SITES (1 MO)
EVALUATE SITES (SOIL, GROUNDWATER (2 MO)
FINANCING (6 MO)
AQUIRE LAND (6 MO)
DESIGN FACILITIES (4 MO)
DEQ REVIEW AND PERMIT (3 MO)
BID AND AWARD (3 MO)
CONSTRUCT (1 YR)



EFFLUENT STORAGE/ IRRIGATION/ WETLANDS

Mc MINNVILLE STP

CH2MHILL

S-7

H:\73PROJ\PDX812.73\FIG1.DWG

WD-139

Richard Nichols, Administrator
Water Quality Division
Department of Environmental Quality
811 S.W. Sixth Avenue
Portland, Oregon 97204

Dear Mr. Nichols:

Recently, our office received a public notice requesting comments on proposed revisions to water quality standards for the Yamhill River basin. I appreciate the opportunity to review this proposal. It is clear that these modifications represent a great deal of work and the Department should be commended for this entire effort.

This proposal represents the first step in developing and implementing a comprehensive water quality management plan for the Yamhill River. Our comments cover both the criteria and the implementation program. I was pleased with both the addition of nutrient standards and compliance dates for the Yamhill River. These proposed actions are a major step forward. The proposed rules also define a good framework for involving local governments in efforts to improve water quality in the Yamhill basin.

I fully realize that significant progress has been made and that significant resources are required to develop and implement good water quality management plans. I want to emphasize, however, the need for the Department to stay on the schedule negotiated as part of the Consent Decree in the NEDC v. Thomas lawsuit. Clearly, the future of Oregon's rivers will be best served by having the Department continue its TMDL efforts.

I look forward to seeing the successful implementation of the proposed rule changes. We hope that good communications among all parties will enable us to continue working together towards our common goal, i.e., the establishment of an effective water quality management process in Oregon. If you have any questions or would like to discuss these issues, I would welcome the opportunity to meet you sometime soon.

Sincerely,

Robert S. Burd
Director, Water Division

Enclosure

U.S. ENVIRONMENTAL PROTECTION AGENCY

Comments on Proposed Revisions to OAR 340-41-470 Yamhill River Water Quality Standards

The following summarizes our review comments over proposed revisions to the Oregon Water Quality Standards. We understand that the proposed changes to OAR 340-41-470 are intended to address water quality problems in the Yamhill River. This will be accomplished by first establishing criteria levels for total phosphorus. An implementation program will then be developed to control pollution sources through the use of total maximum daily loads (TMDLs), waste load allocations (WLAs), and load allocation (LAs). Our comments are divided into two sections which address: 1) proposed criteria and 2) the implementation program.

We realize that significant resources are required to develop and implement good water quality management plans. We also understand that these proposed rules begin to define a framework for improving water quality in the Yamhill basin which involves local governments. The Department should be commended for the enormous time and effort which has been devoted to solving the water quality problems of the Yamhill.

PROPOSED CRITERIA

Where water quality standards are not attained, TMDLs are established in order to provide a focus for implementation plans. A critical step in the water quality management process is to ensure that adequate criteria are in place. The Department has stated that the proposed criteria will form the structure for establishing TMDLs, WLAs, and LAs. Clearly defined standards and criteria are essential if meaningful TMDLs are to be developed. Thus, we fully support the Department's intent to adopt new criteria to solve water quality problems. The criteria are set at levels necessary to protect the uses of the water. In the Yamhill, the Department has identified water quality as adversely affecting two significant uses:

* aquatic life through high pH levels, and
* the aesthetic quality of the river through excessive algal growth.

The Department has identified phosphorus as the pollutant responsible for contributing to the problem. As a result, a phosphorus criterion is proposed by the Department to address pH standards violations caused by excessive algal growth. Our understanding of the basis for the proposed level is summarized as follows:

1. The Department determined that the summer pH violations in the Yamhill River are the result of algal photosynthesis. Reduced concentrations of carbon dioxide due to photosynthesis raise the stream pH. The role of algal growth as the cause of the violations is supported by increased chlorophyll a and dissolved oxygen concentrations in the Yamhill.

2. To determine the appropriate the water quality parameter affecting algal growth in the Yamhill, laboratory algal assays were performed. The results of these tests showed that algal growth will be significantly reduced with phosphate controls.

3. An empirical analysis (Uttormark & Hutchins, 1983) for assessing algal growth conditions in slow moving lake-like rivers was used in conjunction with measured Yamhill River travel times at low flow conditions. From this evaluation, the Department determined that a level of 70 ug/L total phosphorus was needed to significantly reduce algal growth and to prevent nuisance conditions.

4. The Department determined that a time period of May 1 to October 31 was needed for application of the instream criteria. The Department based this on flow and temperature conditions in the Yamhill Basin which could be expected to result in levels of algal growth leading to pH violations.

The identification of phosphorus as the limiting nutrient controlling algal growth follows as scientifically accepted process. The technical rationale the Department used to determine a median of 70 ug/L total phosphorus appears to be supported by both technical literature and field data. The 70 ug/L is also below the suggested general guideline for total phosphorus which appears in EPA's Gold Book. Therefore, EPA has no major concerns with the proposed phosphorus criteria of 70 ug/L for the Yamhill River. However, it would be useful for the Department to provide our office with a more thorough description of the technical analyses prior to formal submittal for EPA approval. This information would include the pH/algal growth/phosphorus model, travel time data, and the hydrologic/stream temperature analysis.

IMPLEMENTATION PROGRAM

The Department has documented that the major source of nutrients in the Yamhill Basin is municipal sewage treatment plants. Allocations to non-point sources have been determined using existing instream concentrations above the wastewater plants have then been based on the remaining amount available. We would encourage the Department to work with the local community in exploring all available options. This could include non-point source controls or an analysis of upstream sewage treatment plant lagoons which do not discharge during the summer, but are located adjacent to the Yamhill River. The proposed rule does allow the re-allocation of loads if other options identified later appear to be more viable.

The proposed additions to OAR 340-41-470 include time schedules for the cities of McMinnville and Lafayette. Within ninety days of adoption of the rules, these cities are to submit program plans to the Department describing how and when they will modify their wastewater treatment facilities to comply with the rules. The support document attached to the public notice describes final effluent limits and time schedules which we assume will be incorporated into McMinnville's NPDES permit. Information, such as interim limits and monitoring conditions, included in other Oregon TMDLs has not been presented. We realize that this information could change once the cities submit plans. However, it would be useful to outline the framework at the onset of the process for public comment. For this process to function as an effective water quality management tool, the TMDL needs to be understood by the Department's permit writers as well as by the regulated community.

Yamhill River
Problem Assessment

Introduction:

The Yamhill Basin, located in Western Oregon, consists of a central plain completely surrounded by hills and mountains. The Yamhill drainage is contained largely within Yamhill County and contains three major subbasins: the South Yamhill, the North Yamhill, and the mainstem Yamhill. Agriculture and forestry are the dominant land uses. The City of McMinnville is the largest urban area within the Yamhill Basin.

The Yamhill River currently exceeds the pH standard during low flow conditions. Chlorophyll a, an algal pigment, often exceeds the 15 ug/l level used to indicate nuisance algal growth. Because of the standards violations, the Yamhill River has been identified as a water quality limited stream segment.

Problem Assessment:

The pH of a stream is strongly influenced by various biological reactions. The dominant effect is the use of carbon dioxide by algae during photosynthesis. Reduced concentrations of carbon dioxide due to photosynthesis raise the stream pH. Photosynthesis also increases the dissolved oxygen concentration in a stream. During periods of pH violations in the Yamhill River, the dissolved oxygen and chlorophyll a concentrations are elevated due to excessive algal growth. The violations in the Yamhill river are due to excessive algal growth.

Almost all waterbodies support the growth of algae to some degree. Algae are primary producers supporting the base of the food chain. Typically, algae do not grow to nuisance proportions. Many factors contribute to algal growth. Some, such as sunlight, are natural phenomena and are not controllable. Most elements required for algal growth are present naturally and required in small amounts. Phosphorus and sometimes nitrogen are nutrients which typically determine the amount of algal growth that will occur. Excessive amounts of these nutrients are directly related to human activities. Nutrient control, typically phosphorus, is a commonly accepted strategy for controlling nuisance algal growths.

Phosphorus is usually the limiting nutrient under natural conditions and is the nutrient most controllable by human activities. Although phosphorus is not the only factor that affects algal growth, studies indicate it has a major effect on the abundance and type of algae produced. Nitrogen is more ubiquitous in nature. Certain plants and blue green algae can fix atmospheric nitrogen. Nitrogen supply is less controllable than

phosphorus. Inorganic carbon, the third nutrient required in large supply, is available from the atmosphere and is not controllable.

Pollution Sources:

The major source of nutrients in the Yamhill Basin are the municipal sewage treatment plants (STP). Three municipal STPs discharge in the Yamhill Basin during the summer, which is the season of concern. These plants and their nutrient load at design flows are listed below and compared to average low flow loads in the Yamhill River above McMinnville.

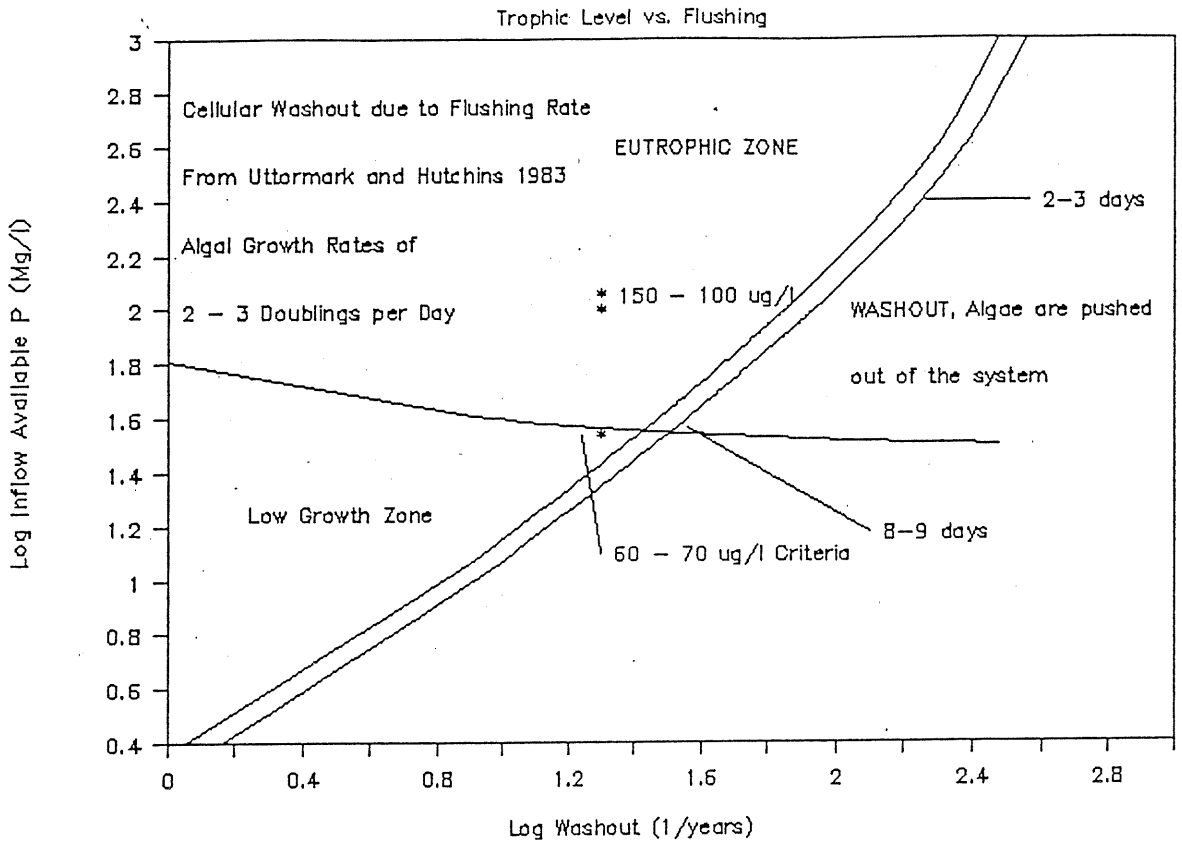
Table 1

Point source:	lbs/Day Phosphorus	Nitrogen	Limiting Nutrient
McMinnville STP (4 MGD)	150	363	Nitrogen
Lafayette STP (0.3 MGD)	14	38	Nitrogen
Carlton STP (0.24 MGD)	9	38	Nitrogen
S.Yamhill (35 cfs)	9	75	Phosphorus

Not all the phosphorus in stream water is available for algal growth. Typically from 20% to 60% of the total phosphorus is available. Ortho phosphorus is considered to represent the readily available supply of phosphorus. In a slow flowing stream like the Yamhill, with longer residence times, a portion of the particulate phosphorus may be available for algal growth. Algal assay data indicate that as much as 60% - 70% of the total phosphorus in the South Yamhill above McMinnville is available for algal uptake. Comparatively, almost all of the phosphorus from municipal effluent is readily available for algal growth. McMinnville's waste discharge would be expected to increase the readily available phosphorus by over 95% during summer low flow conditions.

Nonpoint source pollution also contributes nutrients to the Yamhill River. The Department conducted extensive ambient monitoring during 1988 to quantify both point and nonpoint source loads. Figure 1 illustrates the average total phosphorus concentration in the South Yamhill and mainstem Yamhill Rivers during 1988. The major peak is the result of phosphorus loads from the McMinnville STP. The subsequent drop is due both to assimilation and dilution from the North Fork Yamhill River. The following smaller peak is derived from the Lafayette STP.

Both algal growth and pH respond to the increased nutrient loads below McMinnville. Upstream from McMinnville the pH is within standard and the chlorophyll a concentrations remain below the reference level. At all sampling stations below McMinnville, the pH frequently exceeds standards and chlorophyll a concentrations exceed the reference level which indicates nuisance conditions.



Time of Concern:

Summer low flow conditions are the period of greatest water quality problems in the Yamhill basin. During the winter, low stream temperatures, limited sunlight, and faster flow combine to reduce algal growth. Nutrient limits are required when physical limitations would not control nuisance algal growth. This period extends from April through October.

Stream temperatures observed in October are sufficient to support nuisance algal growth. Similarly, observed low flow conditions of 23 cfs would result in residence time long enough to support algal growth. Ambient data from 1987 through 1988 show pH violations in the Yamhill River occurring from June through September. The time period for application of the instream criteria is described as the low flow period between May 1 and October 31.

Nutrient Concentration:

An instream total phosphorus concentration of 70 ug/l in the Yamhill River will prevent nuisance algal growths and maintain pH within standards. The 70 ug/l criteria was determined using algal assays, empirical analysis, and modelling analysis. Similar results were obtained for the Tualatin River. Data indicates that similar environmental conditions exists for the Yamhill River. Model results show that residence time is sufficiently long to support algal growth, and that nutrient reduction to 70 ug/l total phosphorus is required to prevent nuisance growth in the Yamhill River.

Uttormark and Hutchins (1983) adapted the widely accepted Vollenweider method for assessing algal growth conditions in slow moving lake-like rivers. This empirical model allows residence time, algal growth, and nutrient concentration to be assessed in terms of trophic state. Figure 2 illustrates this empirical model to conditions observed in the Yamhill River.

In Figure 2, the horizontal axis represents the washout rate. Higher streamflow resulting in a long washout rate is the same as a short residence time. The horizontal slanting lines represent potential washout of algae. To the right of these lines residence times are short. Points to the right of the lines would indicate algae do not have time to grow and multiply to nuisance proportions.

Residence time in the Yamhill River below McMinnville was measured by dye test. Under low flow conditions residence time ranges from two to three weeks. Under existing conditions algae can grow to nuisance proportions in approximately three days. If phosphorus was limited an estimated eight to nine days would be required for algae to grow. Washout is not expected to reduce algal growth in the Yamhill River during low flow conditions.

The line slanting across Figure 2 represents Vollenweider's empirical relationship separating high growth conditions from low algal growth conditions, less than 20 ug/l chlorophyll a. However, this relationship is empirical and therefore subjective. Alternative phosphorus criteria can be compared relative to other options. For example, a criteria of 100 to 150 ug/l phosphorus would still be expected to result in high algal growth conditions. Levels near 70 ug/l would be expected to significantly reduce growth and prevent nuisance conditions.

Water quality in the Yamhill basin can be compared to that in other streams in the Willamette Valley. These streams all have low flows in the summer and residence times long enough to support algal growth. Based on eco-region studies conducted in Oregon, the trophic levels and productivity of Willamette valley streams tends to be similar. Water quality in streams that exceed 100 ug/l total phosphorus are overwhelmed by municipal point sources of pollution resulting in excessive algal growth and pH violations.

Stream Name	Drainage Characteristics	Median Total Phosphorus Concentration	Trophic Level (Median - Max Chlorophyll a)
Tualatin at Elsner	Agriculture Urban - STP	240	High Algal Growth 30 - 100+
Mary's River	Agriculture Urban	75	Moderate Algal Growth 7 - 15 ug/l
Calapooia	Agriculture	60	Moderate Algal Growth 5 - 15 ug/l
Luckiamute	Agriculture	40	Low Algal Growth 1 - 5 ug/l
So. Yamhill Above McMinnville STP	Agriculture	40	Low Algal Growth 1 - 10 ug/l
Yamhill River	Agriculture Urban - STP	210	High Algal Growth 13 - 50 (1987)

One algal assay was conducted on water quality samples collected from the Yamhill River. This assay indicated that phosphorus was in excess of algal growth requirements below the McMinnville STP. These result are consistent with the ambient results which indicate that extreme algal growth in the Yamhill River drives nitrogen concentration to low levels. Because of the high phosphorus load and low nitrogen to phosphorus ratio in municipal effluent, this imbalance is expected where municipal discharges overwhelm a stream system.

On the day the algal assay samples were collected, instream phosphorus concentrations were below 150 mg/l and nitrate concentrations were below 300 ug/l. These levels are below typical concentrations of 210 ug/l total phosphorus and 500 ug/l nitrogen. Maximum growth due to nutrient enrichment may not have been achieved in the assays. Samples collected from above McMinnville produced 40% of the algal growth produced by samples collected below McMinnville.

The pH violations in the Yamhill River are the result of photosynthesis. Photosynthesis is the process by which green plants use solar energy and nutrients to grow. It can be described simply as:

Nutrients + Carbon + Water -------> Cell growth + Oxygen

Photosynthesis results in:

-- Increase in the Dissolved Oxygen Concentration

-- Loss of CO_2

-- Increase in the pH resulting from decreased inorganic carbon concentration.

The ability of a water to control pH change is a result of alkalinity. Alkalinity is a measurement of the ability to buffer changes in pH. Most of the Alkalinity in the Yamhill is provided by carbon. Excessive algal growth consumes the carbon in the buffer, causing the pH increases. Since photosynthesis is the dominant sink for inorganic carbon, algal growth can be related stoichiometrically to changes in pH. At the peak pH level of 9.5 observed in the Yamhill River, photosynthesis would have to reduced between 40 to 60% to maintain the standard pH of 8.5. The Department's analysis suggests that the 70 ug/l total phosphorus criteria would attain the required reduction.

TMDL-WLA-LA

The loading capacity of the Yamhill River for phosphorus is defined as 70 ug/l total phosphorus. The evaluation process used defines loads and allocations for a series of flow conditions. For the Yamhill, allocations are distributed by three subbasins: South Fork Yamhill, North Fork Yamhill, and the mainstem Yamhill.

Mass balance procedures were used to develop the allocations. Existing loads were compared to instream concentrations for various flow conditions.

This procedure allowed the estimation of nonpoint source loads, dilution from tributaries, and instream assimilation.

The water quality limited sections are defined as:

The South Fork below McMinnville,

The North Fork below Carlton, and

The mainstem Yamhill.

Point sources requiring waste load allocations include the three municipal treatment plants. In addition, the City of Yamhill has requested a waste load allocation in the event that future needs require discharge to the river.

Upstream load allocations for the North and South Yamhill Rivers are calculated using an existing instream concentration of 50 ug/l of total phosphorus. Additionally, the Department is holding in reserve 5 ug/l for each subbasin.

The allocations, in pounds per day of total phosphate as P, for each basin are presented below. Loads are calculated using the lower end of the presented ranges. For the lowest flow range the design flow is noted in parenthesis.

Total Phosphorus Loads (lbs/d) relative to Flow
Flow as Measured at Whiteson

South Fork Basin Allocation / Description	less than 50 cfs (15)	50 -100	100 - 200	Greater than 200 cfs
LA South Fork NPS	4.0	13.5	27.0	53.6
WLA McMinnville STP	3.5	6.7	10.8	19.2
LA Department Reserve	0.5	1.3	2.7	5.3
TMDL (basin)	8.0	21.5	40.5	78.1

Total Phosphorus Load (lbs/d)

North Fork Basin Allocation / Description	Estimated Flow North Fork[1] less than 15 cfs (7)	15 - 30	30 -50	Greater than 50 cfs
LA North Fork NPS	1.8	3.9	8.0	13.4
WLA Carlton	0.3	0.7	1.3	2.1
WLA Yamhill	0.3	0.7	1.3	2.1
WLA Cove Orchard[2]	----	---	----	----
LA Department Reserve	0.2	0.4	0.8	1.3
TMDL	2.6	5.7	11.4	18.9

Total Phosphorus Loads (lbs/d)

Mainstem Yamhill Allocation / Description	Estimated Flow Below Lafayette[3] less than 75 cfs (30)	75 - 145	145-275	Greater than 275 cfs
LA Upstream Input	10.6	26.9	51.4	96.7
Assimilation	1.5	3.2	5.2	6.5
Allocatable Load	2.2	4.4	8.2	13.0
WLA Lafayette	1.2	2.0	3.3	3.8
LA Mainstem NPS	0.5	1.3	3.1	6.9
LA Department Reserve	0.5	1.1	1.8	2.3
TMDL	11.3	28.1	54.4	103.2

Note: WLA: Portion of the assimilative capacity allocated to a point source.

LA: Portion of the assimilative capacity allocated to nonpoint sources, background, assimilation, or reserved for future growth and development.

TMDL: Sum of the WLAs and LAs.

1 Estimates are from USGS historical data from the North Yamhill at Pike, plus flow from Carlton STP and estimates of flow from the Panther/Backer Creek subbasin.

2 The City of Cove Orchard is in the planning phase for reviewing alternatives to fix a failing subsurface system. Options that are being considered include discharge. The Department would have to

provide an allocation for such a discharge. The amount allocated would depend on receiving stream flow, assimilation, and any reserves allocated.

3 Estimates are made by summing the flows from the South Fork, the North Fork and estimated flows entering the mainstem Yamhill for each flow range. Estimated inflows to the mainstem for each flow range in cfs are 1.34, 3.34, 8.35, and 18.3 respectively.

The LA represent existing conditions with an added reserve set aside by the Department for future growth and development. The basins have been further subdivided into several sub-basins, which are cross-referenced to land use and political entity. These refinements allow LAs to be further divided as needed, or requested by coordinating agencies.

The WLA assumes equal effort for point sources in each subbasin. The WLA for McMinnville utilizes the remaining assimilative capacity for the Yamhill after the Department has held its reserve. The WLA for Lafayette is dependent on the instream assimilation and dilution form tributary flows. The WLAs may be revised pending further work sessions with interested parties in the basin.

Effect of TMDLs and WLAs

Nonpoint sources do not appear to contribute excessive nutrient loads to the mainstem Yamhill River. The load allocations have been established to reflect existing conditions. Reserves have been allocated which provide for future growth and development.

Waste load allocations will directly affect the communities of Carlton, Yamhill, McMinnville, and Lafayette. The City of Carlton is in the process of planning a new wastewater facility. The WLA provides a required goal for the new plant. The WLA therefore provides the design criteria to assure the new plant will not result in water quality violations. No increased costs are expected to result for Carlton due to the WLA.

The WLA to Yamhill provides a requested reserve for the city. The City felt this was necessary to keep their options open for future needs. No direct impacts to the City of Yamhill are expected due to issuing the WLA.

The City of McMinnville's wastewater treatment plant is the major source of nutrients discharged to the Yamhill River. To achieve the WLA will require reducing existing loads by as much as 90% during low flow conditions. Several options are available for achieving the WLA. These options include beneficial reuse by irrigation on city owned or agricultural land, summer holding, advanced treatment with phosphorus removal, or a combination of these alternatives. Costs will also be dependent on the time frames required to achieve compliance. The City of McMinnville has hired a consultant to review potential options and submit a program plan to the Department.

The City of Lafayette provides a significant load of phosphorus to the Yamhill River. To achieve the 70 ug/l total phosphorus would require load

reductions from Lafayette under any circumstances. For example, 130 cfs of dilution flow, at upstream phosphorus levels, would be required for Lafayette to discharge its design flow and not exceed 70 ug/l. Minimum monthly average low flows below 130 cfs have been observed from June through November. Options for Lafayette may depend on the options selected by upstream dischargers. However, Lafayette needs to review options for limiting phosphorus loads during summer low flow conditions.

Existing Concerns:

Salt Creek.

The proposed rules derived from this study do not directly set a criteria for Salt Creek. Salt Creek drains into the South Yamhill above McMinnville. The load from Salt Creek is calculated into the LAs and target criteria for the South Yamhill. Salt Creek routinely violates the dissolved oxygen standard, falling below 1.5 mg/l in the late summer. Salt Creek also has high nutrient concentrations and elevated chlorophyll a levels. Since the LA for the South Yamhill is established on existing conditions, the load from Salt Creek is accounted for. However, the Department may assess water quality in Salt Creek and establish a specific load allocation in the future if this is determined to be appropriate.

Available Dilution:

Oregon Administrative Rules provide an index of dilution required to assimilate point source discharges. This rule states that the effluent biochemical oxygen demand divided by the dilution ratio shall not exceed one. For McMinnville, with its existing effluent quality, this rule suggests 80 cfs for dilution. Insufficient dilution flows occur on the average of over three months per year.

Dissolved Oxygen - NH3.

Dissolved oxygen is seldom violated at sampling locations in the Yamhill River. One reason for this is the relatively low ammonia concentration discharged from McMinnville. As the Department reviews the control options, it is necessary to assure that the assimilative capacity for oxygen demanding wastes is not exceeded. Prior to evaluating control options, however, the Department may need to define the TMDL for BOD.

Oregon Department of Environmental Quality

A CHANCE TO COMMENT ON...

TOTAL MAXIMUM DAILY LOADS

Date Prepared: 8-14-87
Notice Issued: 8-24-87
Comments Due: 9-24-87

WHAT IS PROPOSED:

The Oregon Department of Environmental Quality (DEQ) is proposing a total maximum daily load (TMDL) for phosphorus in the Yamhill and South Yamhill River. This load is based on flow and is as follows:

Maximum Allowable Pollutant Loads
for the Yamhill and South Yamhill River
from June through October

Discharge (cfs)	Maximum Total Phosphorus Load in River (lbs/day)
10 - 20	5
20 - 40	10
40 - 60	20
60 - 100	30
100 - 150	50
150 - 200	80
200 - 300	100
300 - 400	150

WHAT ARE THE HIGHLIGHTS:

The Federal Clean Water Act, under Section 303, requires the establishment of TMDLs for "water quality limited" stream segments. "Water quality limited" stream segments are reaches where water quality standards are not or would not be met after the implementation of technology based effluent limitations. The Yamhill River currently violates the pH standard during summer low flow. The pH problems in the Yamhill River are the result of excessive algal growth. Although phosphorus is not the only factor which stimulates algal growth, studies indicate that it can have a major effect on the abundance and type of algae produced. The Department believes that phosphorus is a critical parameter that is directly related to water quality problems in the basin.

811 S.W. 6th Avenue
Portland, OR 97204

FOR FURTHER INFORMATION:

Contact the person or division identified in the public notice by calling 229-5696 in the Portland area. To avoid long distance charges from other parts of the state, call 1-800-452-4011.

HOW IS THE PUBLIC AFFECTED: Residents and industries of Yamhill County served by municipal treatment plants which discharge to the Yamhill System, industries which discharge in the Yamhill drainage, and recreationalists who use the Yamhill River. Of the municipal treatment plants, Dayton, Sheridan, Willamina, and Amity operate lagoon systems. Amity irrigates its wastewaters during summer. Yamhill operates a mechanical treatment plant followed by a lagoon which stores the wastewater for summer irrigation. The treatment facilities at McMinnville, Carlton, and Lafayette discharge treated effluent year-round.

INFORMATION AVAILABLE For additional information, contact DEQ Public Affairs at 229-5766. A report is attached which provides a water quality assessment of the Yamhill River. An Environmental Quality Commission (EQC) staff report, which provides background information on the issues of TMDLs, is also available on request.

HOW TO COMMENT: Written comments on the proposed TMDL for phosphorus in the Yamhill and South Yamhill River and the attached problem assessment for the Yamhill River should be presented to DEQ by September 17, 1987 at the following address:

Mr. Neil Mullane
Manager, Planning & Monitoring Section
Department of Environmental Quality
Water Quality Division
811 S.W. Sixth Avenue
Portland, OR 97204 Telephone: 229-5284

WHAT IS THE NEXT STEP: The Department will review and evaluate all comments and make appropriate revisions. The Department will forward a copy of the staff report, which will include the comments and responses, to each commenter.

WC2241

PROBLEM ASSESSMENT: Yamhill River

Introduction

The Yamhill basin, located in western Oregon, consists of a central plain completely surrounded by hills and mountains. The Yamhill drainage contains three major subbasins -- the South Yamhill, the North Yamhill, and the Yamhill. The South Yamhill River (61 miles long) and the North Yamhill River (32 miles long) originate on the eastern slopes of the Coast Range, in rugged, timbered terrain. Both rivers enter rolling valley lands noted for high agricultural productivity, and then converge near McMinnville to become the Yamhill River. The Yamhill River flows east for 11 miles and empties into the Willamette River.

The entire Yamhill basin includes a drainage area of 770 square miles. The South Yamhill subbasin drains 520 square miles while the North Yamhill subbasin drains 185 square miles. The Yamhill Basin is contained largely within Yamhill County, with a portion of the drainage extending into Polk County. The major tributaries include Palmer Creek to the Yamhill River; Salt Creek, Deer Creek, Mill Creek, and Willamina Creek to the South Yamhill River; and Haskins Creek to the North Yamhill River.

The major land uses in the Yamhill basin are agriculture and forestry. Wheat and barley, horticulture crops, and dairy products are the primary agricultural commodities produced in Yamhill County. A third of the county is also covered with commercial timber, the focus of the economy in the western Yamhill valley. The largest city in the Yamhill basin is McMinnville (estimated population 15,000). Other towns include Amity, Carlton, Dayton, Lafayette, Sheridan, Willamina, and Yamhill.

Streamflows in the Yamhill drainage follow the typical pattern observed in other rivers on the west side of the Willamette Valley. The lowest flows and highest temperatures occur during the summer months of July, August, and September. For example, the average August flow for the South Yamhill River near McMinnville is 50 cubic feet per second (cfs). The water surface slope of the Yamhill River is also very small. This results in sluggish flows during the summer. These conditions lead to the greatest period of stress for uses dependent on good water quality.

Problem Description

Oregon Administrative Rules (OAR) Chapter 340, Division 41, rule 442, lists the beneficial uses for which water quality will be protected in the Yamhill Basin. They are: Public Domestic Water Supply, Private Domestic Water Supply, Industrial Water Supply, Irrigation, Livestock Watering, Salmonid Fish Rearing, Resident Fish & Aquatic Life, Wildlife and Hunting, Fishing, Boating, Water Contact Recreation and Aesthetic Quality.

The list of beneficial uses that water in each of Oregon's 18 drainage basins shall serve was established by the Oregon Water Resources Commission pursuant to direction given in ORS 536.300. As charged by ORS 468.020, the Oregon Environmental Quality Commission adopted such rules and standards as were necessary to protect those recognized beneficial uses. In practice, water quality rules and standards have been set at levels to protect the most sensitive of the uses, fish and human water supplies.

A number of water quality parameters have criteria values which have been adopted as regulatory standards for the Yamhill Basin. Included are temperature, turbidity, pH, dissolved oxygen, fecal coliform bacteria, and dissolved chemical substances. To evaluate ambient water quality against the standards, monitoring data have been collected routinely by DEQ at three stations in the Yamhill basin. One site is located in each of the three major subbasins. Station locations are as follows: South Yamhill River above McMinnville (RM 17.0), North Yamhill River at McMinnville (RM 1.5), and Yamhill River at Dayton (RM 4.9).

Monitoring results are summarized in Table 1 for several parameters of interest. Table 1 identifies the season of concern, median values monitored during that season, and the 90th percentile of all observations in the season of concern.

Table 1. Yamhill Basin Water Quality Summary

Parameter	Season	Stat.	N Yamhill at McMinn.	S Yamhill above McMinn.	Yamhill R at Dayton
pH	Summer	Med. 90 %	7.4 7.7	7.4 7.7	7.6 8.7
Fecal Coliform (#/100ml)	Summer	Med. 90 %	150 460	43 930	36 240
Turbidity (JTUs)	Annual	Med. 90 %	7 32	5 32	6 26
Phosphate (ug/L)	Summer	Med. 90 %	62 94	38 64	172 282
Chlor. a (ug/L)	Summer	Med. 90 %	1.1 6.0	1.2 8.1	3.9 10.0
Unionized Ammonia (ug/L)	Summer	Med. 90 %	0.5 1.0	0.4 1.0	0.9 5.1

According to the standards, the pH (hydrogen ion concentration) shall not fall outside the range of 6.5 to 8.5. The pH for the Yamhill River at Dayton has exceeded 8.5 during critical conditions in the summer months. The pH of a stream is strongly influenced by various biological reactions. The most conspicuous effect is the use of carbon dioxide by algae and other aquatic plants. Photosynthesis tends to use up carbon dioxide which then increases the pH.

During the periods of pH water quality standards violations in the Yamhill River, dissolved oxygen concentrations were also elevated (140 percent saturation). Dissolved oxygen levels which exceed saturation are indicative of high algal productivity. In addition, chlorophyll a measurements at the time of the pH violations were between 18 and 21 ug/l. This exceeds the Oregon action level of 15 ug/l for nuisance phytoplankton growth. Thus, pH problems in the Yamhill River are the result of excessive algal growth.

Many factors contribute to algal growth. Some, such as sunlight, are natural phenomena. Other factors, such as nutrient levels, are influenced by the activities of man. Many studies suggest that phosphorus is a major factor leading to excessive algal growth. Phosphate concentrations monitored at the Yamhill station (Table 1) are significantly higher than phosphate measured in the upstream tributaries. Thus, the data indicates a major phosphorus source in the Yamhill drainage between McMinnville and Dayton.

Several other water quality parameters are of concern in the Yamhill basin. Elevated levels of fecal coliform bacteria and turbidity have also been observed. These standards violations are related to the effects of non-point sources, since the station with the highest levels is above McMinnville. Seasonal turbidity violations can result from stormwater induced soil erosion. Occasional sewage bypasses and land runoff contribute to high bacteria measurements.

Pollutant Sources

Stream quality is affected in a variety of ways. Generally, land use exerts the greatest effect on water quality. During periods of low flow, point source discharges can also have a major influence on the quality of a receiving water.

In terms of water quality standards violations, the summer months are the period of greatest concern in the Yamhill basin. Land use in the drainage is predominantly agriculture and forestry. Irrigation on the agricultural lands is largely through sprinkler systems. This practice produces very little runoff in the summer.

The other potential source of water pollution is the point sources. A number of communities have waste treatment facilities in the Yamhill basin. Most of the treated effluent is held in lagoons during the summer and released during the winter. The wastewater

from one lagoon and from a mechanical plant-lagooon system are spray irrigated on agricultural land during the summer, instead of being discharged to the river. The exceptions are McMinnville, Lafayette and Carlton which discharge treated effluent year-round.

The City of McMinnville operates a trickling filter / activated sludge sewage treatment plant (STP). Treated effluent is discharged to the South Yamhill River at RM 4. The permitted dry weather flow is 4 mgd. The permitted monthly average BOD/SS effluent concentration is 20/20 from May 1 to October 31. Carlton also operates a 0.3 mgd trickling filter which discharges to the North Yamhill River at RM 10. Lafayette operates a 0.3 mgd activated sludge/polishing pond system which discharges to the Yamhill River at RM 8.0.

The McMinnville STP is the major point source discharge in the Yamhill basin. The influence of the McMinnville STP on water quality is particularly evident during the summer, when flows in the Yamhill River are low. The increase of phosphate is one noticeable effect. This is highlighted in Table 1 by noting the significant difference in phosphate concentrations between the South Yamhill above McMinnville station and the Yamhill River station (which is below the McMinnville STP).

Phosphate concentrations in the North Yamhill River are also higher than those in the South Yamhill River. A mixing zone study of the North Yamhill conducted by the Department in August 1986 showed a significant increase in phosphate loads below the Carlton outfall.

The dramatic increase in total phosphate highlights the need to review the assimilative capacity of the Yamhill River. A logical starting point is to evaluate available dilution. Low flows in the South Yamhill River typically fall below 30 cfs. The 7-day average low flow which occurs every other year (7Q2) is 28 cfs (U.S. Geological Survey, 1984). Using a permitted discharge flow of 4 mgd for the McMinnville STP and the 7Q2 of 28 cfs gives a dilution ratio of 4.5. Likewise, a permitted discharge of 0.3 mgd for the Carlton STP and a 7Q2 of 8.2 cfs for the North Yamhill River gives a dilution ratio of 17.6 at the Carlton outfall.

The Oregon Water Quality Standards provides a frame of reference for evaluating dilution. OAR 340-41-455(1) states that "Effluent BOD concentrations in mg/L divided by the dilution factor shall not exceed one." In other words, the dilution ratio represents the maximum allowable BOD effluent concentration. BOD, in turn, reflects the level of treatment provided to municipal wastewater. Table 2 summarizes annual low flow data for the South Yamhill River to further illustrate the concern over available dilution. Based on the treatment criteria defined in the standards, there is inadequate dilution in the South Yamhill River to assimilate the McMinnville STP discharged flow.

Table 2. Low Flow Summary for the South Yamhill River

Year	Low 1-Day Flow (cfs)	Maximum Allowable BOD Effluent Concentration for McMinnville STP to meet Dilution Ratio (mg/L)
1976	20	3.2
1977	10	1.6
1978	27	4.4
1979	17	2.7
1980	19	3.1
1981	19	3.1
1982	7	1.1
1983	52	8.4
1984	33	5.3
1985	32	5.2

Actions to Date

Areas where water quality standards are not or would not be met after the implementation of technology-based effluent limitations are said to be "water quality limited". In January 1987, the Department identified the Yamhill River as being "water quality limited". The parameters violating water quality standards include pH, fecal coliform bacteria, and turbidity.

On March 13, 1987, the Environmental Quality Commission (EQC) approved a process for establishing total maximum daily loads (TMDLs) on "water quality limited" stream segments. Phase I is scheduled for completion by August 1987 on the Yamhill River for phosphorus to address pH violations.

Pollution Control Strategy

The first phase is to propose a site specific TMDL for the Yamhill and South Yamhill Rivers to eliminate the pH violations caused by algal growth. As the TMDL is developed, current waste discharge requirements for point source permits will be reviewed. For permit renewals where no increase in discharge is requested, the Department intends to reissue without modification of permit limits.

After the TMDL has been adopted, it will be the Department's responsibility to address point source permits consistent with the implementation strategy. Current administrative rules (OAR 340-45-055) allow the Department to modify existing permits and to include

new limits for complying with established waste loads if the implementation strategy would so dictate. Should reduced limits be placed in permits, compliance schedules for reaching those limits would be specified and would be consistent with the adopted implementation strategy.

The development of TMDLs for parameters related to non-point sources will be conducted sometime after completion of the Department's non-point source assessment (August 1988). The Department will coordinate with the Yamhill County Soil & Water Conservation District (SWCD) to develop a plan for addressing NPS problems related to bacteria and turbidity.

Allowable Phosphorus Load

In April 1987, the Department proposed a TMDL for phosphorus in the Tualatin River. This TMDL was based on a target value for phosphorus of 0.15 mg/L. Algal assay studies have been conducted in the Tualatin since this TMDL was proposed. The results of the recent Tualatin tests indicate that a target level of 0.10 mg/L is required to significantly reduce algal growth. The Yamhill Basin is very similar to the Tualatin. In the absence of specific algal assay information for the Yamhill River, it is appropriate to apply study results from the Tualatin. Thus, a TMDL based on a guidance value of 0.10 mg/L total phosphorus will eliminate the current pH violations in the Yamhill River.

The approach being used in Oregon is to identify a set of loads for varying flow conditions. This technique better addresses the dynamic nature of rivers. This approach also allows a variety of options to be pursued to comply with water quality standards. Alternatives include specifying permit conditions in terms of receiving water flows or using upstream reservoir storage capacity to increase stream flows. By using varying flow conditions and the target concentrations, maximum allowable pollutant loads have been calculated. These loads are presented in Table 3.

Table 3. Maximum Allowable Pollutant Loads for the Yamhill and S. Yamhill Rivers from June through October

Discharge (cfs)	Maximum Total Phosphorus (lbs/day)
10 - 20	5
20 - 40	10
40 - 60	20
60 - 100	30
100 - 150	50
150 - 200	80
200 - 300	100
300 - 400	150