# Note to the reviewers and authors

The following is an excerpt from the draft TMDL issue paper that identifies some of the issues with the way TMDLs are currently developed and implemented in Oregon. The intent of drafting the TMDL IMD at this time is to address the following shortcomings.

The main criticism from DMAs as well as others about the current TMDL approach is the TMDLs do not provide enough detailed information about pollutant sources for the DMAs to take specific management actions. The DMAs identified the need for more detailed information in order to plan where and when management actions, such as conservation practices, should be implemented to meet TMDL load allocations (LAs). The current TMDL approach in Oregon needs to be improved to address toxic reductions more effectively and efficiently.

The shortcomings indentified for the recent basin scale TMDLs include:

TMDL development

1. Lack of detail in analyses due to spatial scale and available data
2. Insufficient source analyses Lack of clear policy to include air source analyses
3. Lack of timelines and measurable milestones
4. Insufficient reasonable assurance for meeting goals

TMDL Implementation

1. Unclear goals and priorities for nonpoint sources – including Agriculture, Forestry, and Urban and Rural Residential DMAs
2. Unclear goals and priorities for point sources – Urban DMAs including MS4 Permittees
3. Lack of process to resolve disagreements between agencies
4. Lack of process to ensure BMP and program effectiveness

One way to improve the process is to provide better source assessment information to guide implementation planning. DEQ will develop an Internal Management Directive (IMD) for TMDLs to provide information to guide DEQ staff when applying existing statutes and rules related to development and implementation of TMDLs. The IMD will include guidance for addressing the issues listed above for toxics and other pollutants. Other program areas in need of guidance such as implementation of environmental justice will also be addressed throughout the IMD.

# Table of Contents

Contents

[Note to the reviewers and authors 1](#_Toc293894165)

[Table of Contents 2](#_Toc293894166)

[1 Introduction: 7](#_Toc293894167)

[2 Background Information 7](#_Toc293894168)

[2.1 TMDL Program in Oregon 7](#_Toc293894169)

[2.2 Regulatory Authority 8](#_Toc293894170)

[2.3 EQC’s Policy and Practice on TMDLs 9](#_Toc293894171)

[2.3.1 Oregon Administrative Rules 9](#_Toc293894172)

[2.3.2 Decisions related to TMDL Development and Implementation 9](#_Toc293894173)

[2.4 Prioritizing and scheduling TMDL development and implementation 10](#_Toc293894174)

[2.5 Scope of the IMD 10](#_Toc293894175)

[3 Watershed Planning 10](#_Toc293894176)

[3.1 How TMDLs fit within watershed planning processes 10](#_Toc293894177)

[3.2 Identifying areas in need of TMDLs 11](#_Toc293894178)

[4 TMDL Development 12](#_Toc293894179)

[4.1 Overview 12](#_Toc293894180)

[4.2 TMDL Elements (Division 42 ) 12](#_Toc293894181)

[4.3 Establishing and working with a local advisory group 14](#_Toc293894182)

[4.3.1 Role of the advisory group 14](#_Toc293894183)

[4.3.2 Guidelines for selecting stakeholders for the advisory group 15](#_Toc293894184)

[4.3.3 Subcommittees 15](#_Toc293894185)

[4.4 Source Assessment 15](#_Toc293894186)

[4.4.1 Data Needed for Source Assessment (TMDL Development) 16](#_Toc293894187)

[4.4.2 Identification of pollutant sources 17](#_Toc293894188)

[4.4.2.1 Point sources 17](#_Toc293894189)

[4.4.2.2 Urban stormwater 18](#_Toc293894190)

[1. Nonpoint sources 18](#_Toc293894191)

[2. Air and Land sources 19](#_Toc293894192)

[4.5 Development of the Loading Capacity 19](#_Toc293894193)

[4.6 Strategies for Assigning Pollutant Allocations 19](#_Toc293894194)

[4.6.1 Assign Load Allocations 20](#_Toc293894195)

[4.6.1.1 Involving local partners in LA assignment 20](#_Toc293894196)

[4.7 4.6.2 Assign Waste Load Allocations 21](#_Toc293894197)

[4.4.2.5 Flow/ Water Quantity 22](#_Toc293894198)

[4.8 Set Margin of Safety 22](#_Toc293894199)

[4.9 Address Seasonal Variation 23](#_Toc293894200)

[4.10 Reserve Capacity 23](#_Toc293894201)

[4.11 Reasonable Assurance 23](#_Toc293894202)

[5 WQMP 24](#_Toc293894203)

[5.1 Overview 24](#_Toc293894204)

[5.2 WQMP Elements (Division 42) 25](#_Toc293894205)

[5.2.1 Condition assessment and problem description. 25](#_Toc293894206)

[5.2.2 Goals and objectives 25](#_Toc293894207)

[5.2.3 Proposed management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category. 26](#_Toc293894208)

[5.2.4 Timeline for implementing management strategies including: 26](#_Toc293894209)

[5.2.5 Explanation of how implementing the management strategies will result in attainment of water quality standards 26](#_Toc293894210)

[5.2.6 Timeline for attainment of water quality standards 26](#_Toc293894211)

[5.2.7 Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. 26](#_Toc293894212)

[5.2.8 Identification of sector-specific or source-specific implementation plans that are available at the time the TMDL is issued. 27](#_Toc293894213)

[5.2.9 Schedule for preparation and submission of sector-specific or source-specific implementation plans by responsible persons, including DMAs, and processes that trigger revisions to these implementation plans 27](#_Toc293894214)

[5.2.10 Description of reasonable assurance that management strategies and sector specific or source specific implementation plans will be carried out through regulatory or voluntary actions. 27](#_Toc293894215)

[5.2.11 Plan to monitor and evaluate progress toward achieving TMDL allocations and water quality standards including: 27](#_Toc293894216)

[5.2.12 Plan for public involvement in implementing management strategies. 27](#_Toc293894217)

[5.2.13 Description of planned efforts to maintain management strategies over time. 27](#_Toc293894218)

[5.2.14 General discussion of costs and funding for implementing management strategies. Sector-specific or source-specific implementation plans may provide more detailed analyses of costs and funding for specific management strategies. 28](#_Toc293894219)

[5.2.15 Citation of legal authorities relating to implementation of management strategies. 28](#_Toc293894220)

[5.3 Reasonable Assurance 28](#_Toc293894221)

[5.3.1 Oregon’s Section 319 Management Plan 28](#_Toc293894222)

[5.3.2 DEQ’s regulatory authority 29](#_Toc293894223)

[5.3.3 Documenting local partnerships and ongoing implementation efforts to provide reasonable assurance 29](#_Toc293894224)

[5.4 Setting Timelines and Milestones 29](#_Toc293894225)

[5.4.1 Considerations and process for setting permit schedule 30](#_Toc293894226)

[5.4.2 Considerations and process for working with local partners to set timelines and milestones 30](#_Toc293894227)

[5.5 Potential Pollutant Reduction Strategies 30](#_Toc293894228)

[5.5.1 Pollutant reduction for Point Sources 30](#_Toc293894229)

[5.5.2 Pollutant reduction through other programs 31](#_Toc293894230)

[5.6 Funding 31](#_Toc293894231)

[5.7 Monitoring and Adaptive Management 31](#_Toc293894232)

[6 TMDL Implementation 32](#_Toc293894235)

[6.1 Overview 33](#_Toc293894236)

 [Designated Management Agencies (DMAs) and their Programs for implementing TMDLs 34](#_Toc293894248)

[6.2 34](#_Toc293894249)

[6.2.1 Department of Environmental Quality (DEQ) 34](#_Toc293894250)

[6.2.2 Local Governments and municipalities 34](#_Toc293894251)

[6.2.3 Department of Forestry (ODF) 34](#_Toc293894252)

[6.2.4 Department of Agriculture (ODA) 34](#_Toc293894253)

[6.2.5 DSL) 35](#_Toc293894254)

[6.2.6 Federal Land Management Agencies such as Bureau of Land Management (BLM) USDA Forest Service (USFS) and US Fish and Wildlife Service (USFWS) 35](#_Toc293894255)

[6.2.7 Oregon Department of Transportation 35](#_Toc293894256)

[6.3 Other programs that support goals of TMDLs 35](#_Toc293894257)

[6.3.1 Oregon Plan for Salmon and Watersheds 35](#_Toc293894260)

[6.3.2 Oregon Conservation Strategies 35](#_Toc293894261)

[6.3.3 Integrated Water Resource Strategy 35](#_Toc293894263)

[6.4 Compliance and Enforcement 35](#_Toc293894265)

[6.5 37](#_Toc293894266)

[6.5.1 37](#_Toc293894267)

[6.5.2 37](#_Toc293894268)

[6.5.3 37](#_Toc293894269)

[6.5.4 37](#_Toc293894270)

[6.5.5 37](#_Toc293894271)

[6.5.6 37](#_Toc293894272)

[6.6 Evaluating the adequacy of Implementation Plans 37](#_Toc293894273)

[6.6.1 Implementation Plan Elements (Division 42) 37](#_Toc293894274)

[6.6.2 Applicable DMAs (When to require DMAs to develop implementation plans) 40](#_Toc293894275)

[6.6.3 Minimum requirements for implementation plans 40](#_Toc293894276)

[6.6.4 Negotiating the level of detail in implementation plans based on DMA’s capacity 41](#_Toc293894277)

[6.6.5 Implementation Plan approval process 42](#_Toc293894278)

[6.7 Guidelines for evaluating the adequacy of AgWQMAP and Rules 44](#_Toc293894279)

[6.7.1 Biennial Reviews and Interim Check-ins 45](#_Toc293894280)

[6.7.2 Work agreements between ODA and LMA 46](#_Toc293894281)

[6.7.3 Minimum requirements for AgWQMAP and Rules for implementing TMDLs 46](#_Toc293894282)

[6.7.4 Sources for BMP effectiveness 49](#_Toc293894283)

[6.7.5 Process for Conflict resolution (4.3.2) 49](#_Toc293894284)

[6.8 Guidelines for evaluating the adequacy of FPA Rules 50](#_Toc293894285)

[6.8.1 FPA Reviews during TMDL development 50](#_Toc293894286)

[6.8.2 Minimum requirements to implement TMDLs 50](#_Toc293894287)

[6.8.3 Sources for BMP effectiveness 51](#_Toc293894288)

[6.8.4 Process for Conflict resolution (4.3.2) 51](#_Toc293894289)

[6.9 Tools and Process for tracking practices and actions identified in Implementation Plans to meet load allocations 51](#_Toc293894290)

[6.9.1 Models to identify priority areas and quantity of practices needed (also see 4.5 and 4.6) 51](#_Toc293894291)

[6.9.2 Assistance to DMAs and source sectors to quantify management strategies needed to meet load allocations. 51](#_Toc293894292)

[6.9.3 Assistance to DMAs and source sectors to develop specific timelines and milestones based on quantified management measures and TMDL timelines and milestones 52](#_Toc293894293)

[6.10 Monitoring and Adaptive Management 52](#_Toc293894294)

[6.10.1 Determining monitoring responsibilities for DMAs 52](#_Toc293894295)

[6.10.2 Seeking opportunity for coordinated monitoring for evaluating TMDL implementation effectiveness 52](#_Toc293894296)

[6.10.3 Including local partners in TMDL monitoring 52](#_Toc293894297)

[6.10.4 Engaging local partners in adaptive management 52](#_Toc293894298)

# Introduction:

Oregon’s TMDL Program: Building partnerships for measuring progress, reporting success, adjusting management practices

For the past decade, DEQ’s TMDL program had been driven by a consent decree between the US Environmental Protection Agency (EPA) and Northwest Environmental Defense Center (NEDC), John R. Churchill, and Northwest Environmental Advocates (NWEA) approved and signed on October 17, 2000 regarding the establishment of TMDLs based upon the February 1, 2000 MOA between EPA and DEQ. The Consent Decree specified the cumulative number of TMDLs to be established through 2010. With the approval of Malheur TMDL in 2010, DEQ met the conditions of the consent decree.

Anticipating the change in the TMDL program expected from meeting the consent decree, DEQ began evaluating the effectiveness of the way TMDLs are developed and implemented in Oregon. In an issue paper called *Total Maximum Daily Loads for Reducing Toxic Pollutants in Oregon Waters from non-NPDES (National Pollutant Discharge Elimination System) Sources* DEQ proposed to improve TMDLs by providing better source assessment information to guide implementation planning where needed. Changes being proposed come from resource limitations but also feedback received from stakeholders and staff about Oregon’s TMDL program.

In addition to Consent Decree Era “Basin Scale TMDLs” that maximize the number of stream segments addressed, DEQ will begin shifting some of its resources to develop “Implementation Ready TMDLs” that incorporate more rigorous implementation planning during TMDL development.

Basin Scale TMDLs: TMDLs that are developed at a scale of 6 or 8 digit HUC (Basin and Subbasin scale) for impairments that are best addressed at landscape scale such as temperature.

Implementation Ready TMDLs: TMDLs that are developed at a scale of 12 to 14 digit HUC (watershed and subwatershed scale) for impairments that would benefit from detailed source analysis and implementation planning.

The purpose of this internal management directive (IMD) is to provide DEQ staff with a consistent framework for developing and implementing TMDLs as the TMDL program incorporates new approaches to developing and implementing TMDLs. In addition, the IMD documents how DEQ makes decisions related to TMDLs within its regulatory authority.

# Background Information

This section provides information relevant to TMDL development and implementation in Oregon.

## TMDL Program in Oregon

The ultimate goal of a TMDL is to provide a plan where the beneficial uses of impaired waters are restored. This is achieved when the water quality standards for the impaired waters are met. The TMDL provides estimates of pollutant loads that can enter a water body. The TMDL include loads from nonpoint sources (Load Allocations or LA) and waste loads from point sources (Waste Load Allocations or WLA). The initial targets for implementing the TMDL are the LA and WLA. However, if WQS are met before meeting LA, further implementation of LA may not be needed. Likewise, if LA are achieved and WQS are still not met, additional reductions in LA may be needed.

Oregon’s TMDL program sets quantitative goals for various implementing organizations such as NPDES permit holders, Designated Management Agencies (DMAs) including state and federal agencies, cities and municipalities, and in some cases, source or sector specific nonpoint sources. DEQ communicates its expectations to DMAs through Department orders.

While TMDL development and implementation are relatively straight forward for NPDES permit holders, there are some DMAs whose participation in the TMDL program is detailed in Oregon Revised Statutes. TMDL implementation for nonpoint source pollution from forest lands are rule based (FPA), while agricultureal activities that could impact water quality are managed under area plans and regulated under area rules. For some public lands, DEQ negotiates MOAs for implementing TMDLs.

DEQ seeks to carry out its TMDL responsibilities in the context of watershed planning and:

* Listen to and learn from those who live and work in the basin and work in partnership with basin stakeholders
* Involve stakeholders in solutions and help stakeholders find solutions
* Provide regulatory certainty with implementation flexibility
* Providing information to help prioritize implementation projects within a basin and effective leveraging of funding from other sources

## Regulatory Authority

DEQ is authorized under federal Clean Water Act as well as Oregon statute to develop and implement TMDLs.

* CFR40§130 Total maximum daily loads (TMDL) and individual water quality-based effluent limitations.

http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div8&view=text&node=40:21.0.1.1.17.0.16.8&idno=40

* ORS468B.110 (1) states that DEQ has the specific authority to take the actions necessary to attain and maintain water quality standards and to implement load allocations established under a TMDL.

* OAR340-042 Total Maximum Daily Load explains that the Environmental Quality Commission may impose limitations and controls including Total Maximum Daily Loads (TMDLs), wasteload allocations for point sources and load allocations for nonpoint sources to achieve and maintain water quality standards.
* OAR340-012-0055 (2) explains DEQ’s authority to enforce TMDLs. See 6.2 for guidance.

The document Authorities related to Nonpoint (Non-NPDES) Source Pollution Prevention and Control summarizes the legal authorities currently available to DEQ to prevent, control, and abate existing and new sources of water pollution from nonpoint sources which are defined as non-NPDES permitted sources. (Appendix A)

## EQC’s Policy and Practice on TMDLs

### Oregon Administrative Rules

340-042-0025

(2) The policy of the Environmental Quality Commission is to have the Department of Environmental Quality establish TMDLs, including wasteload and load allocations, and have responsible sources meet these allocations through compliance with discharge permits or other strategies developed in sector or source-specific implementation plans. These measures must achieve and maintain water quality standards and restore waters of the state that are water quality limited.

(3) These rules establish procedures for developing, issuing and implementing TMDLs as required by the Federal Water Pollution Control Act Section 303(d) (33 USC Section 1313(d)) and authorized by Oregon statutes to ensure that state water quality standards are met and beneficial uses protected.

### Decisions related to TMDL Development and Implementation

The EQC’s Policy for TMDL development and implementation is implemented through the Water Quality Program, via coordination among the Regions, HQ and the LEAD with assistance from the Attorney General’s office as needed.

Decision Making (Gene – would you fill this out?)

* Staff: Make decisions related to assigned basins based on technical basis and local knowledge
* Management:
* Division/Regional administrator:
* Attorney General: Provide legal guidance to agencies

Roles of HQ Programs:

* Federal liaison (EPA, USFS, BLM)
* Liaison with state agencies and Boards (Ag, Forestry, EQC)
* Set policy
* Technical support including modeling
* Primary TMDL development
* Integration of TMDLs into Watershed Approach

Roles of Region:

* Stakeholder outreach and coordination
* Modeling, TMDL development
* TMDL implementation
* Sampling/monitoring design for TMDL development and implementation/effectiveness
* Liaison with Lab
* Develop basin-specific knowledge

## Prioritizing and scheduling TMDL development and implementation

TMDL Development: TMDL development schedule is set by regional WQ managers and HQ TMDL program manager annually. Decisions are based on funding, available resources, water quality impairment, available data, and local and EPA interests.

TMDL Implementation: The following factors are considered when determining priorities for distributing DEQ resources across basins as well as Basin Coordinator’s time investment within a basin:

* Accounting for sources and understanding relative contributions to water quality impairment
* Protection of existing resources, waterbodies meeting or close to standards
* Accounting for current management practices and extent of contribution to pollutant reduction
* Understanding pollutant load reductions necessary and implementing practices that address largest sources

## Scope of the IMD

The purpose of this internal management directive (IMD) is to provide DEQ staff with a consistent framework for developing and implementing Total Maximum Daily Loads (TMDLs). While it covers both development and implementation of TMDLs, this IMD is focused on how to develop certain elements of WQMPs and to guide local implementation efforts. As DEQ gains more experience with different scales of TMDLs, the IMD will be modified or new guidance will be developed as necessary.

# Watershed Planning

DEQ is shifting to a Watershed Approach (WA) in order to prioritize environmental issues and coordinate efforts within a specific geographic area. This section provides background information on the WA and how TMDLs may fit into the WA process.

## How TMDLs fit within watershed planning processes

The Watershed Approach (WA) process is intended to provide a basin-scale resource assessment process with much greater opportunities for direct, interactive feedback from local stakeholders than the Total maximum Daily Load (TMDL) process, alone. In some basins, WA process could occur prior to or after TMDL development, whereas may occur concurrently in others.

Unlike a TMDL, the WA process is not limited to addressing 303(d) listings using available water quality data. It addresses surface water status for both 303(d) listings and other surface water related concerns, groundwater and upland conditions, and provides an evaluation of the environmental status of the basin as a whole. While the WA process is being designed to address some of the limitations of the TMDL process, it will not replace TMDLs. The TMDL process will continue within the state and the WA process for separate basins will inform and assist the Basin TMDL process. It is envisioned that the WA process will allow directed implementation to proceed prior to completion of the formal TMDL.

The WA does not have the regulatory authority of a TMDL and should be viewed more as a guidance document than a regulatory requirement. The WA does not identify waste load allocations for point sources or load allocations for nonpoint sources. It will however, potentially inform load and waste load allocations in Basin TMDLs where the level of data available to the WA process is appropriate, and may inform other regulatory processes.

The products of the WA process consist of two primary elements: a basin status report and a basin action plan. Stakeholder involvement is also a critical component of the WA.

See appendix B for WA related planning documents and products.

## Identifying areas in need of TMDLs

In addition to the annual planning process taken by regional and HQ managers, WA provides an opportunity to identify areas in need of basin scale TMDLs. In basins where WA process occurs prior to or concurrent with TMDL development, the following considerations should be taken to determine if TMDLs are needed.

* Pollutant/ cause of impairment
* Extent of impairment
* Potential sources
* Land use
* Available resources to support implementation efforts

The result of the finding during WA will be considered when managers develop schedules for TMDLs.

Implementation Ready TMDLs

Implementation Ready TMDLs are developed at a scale of 12 to 14 digit HUC (watershed and subwatershed scale) for impairments that would benefit from detailed source analysis and implementation planning.

* Advantages/disadvantages: More information to guide implementation, and potential stakeholder buy-in of the implementation strategies/ cost and resource intensive
* Additional needs of an IR TMDL compared to Basin Scale TMDL: More data (land use, water quality, conservation measures, sources of pollution) and time for local coordination

Basin Scale TMDLs

Basin Scale TMDLs are developed at a scale of 6 or 8 digit HUC (Basin and Subbasin scale) for impairments that are best addressed at landscape scale, for example, temperature.

* Advantages/disadvantages: More information to guide implementation, and potential stakeholder buy-in of the implementation strategies/ cost and resource intensive
* Additional needs of an IR TMDL compared to Basin Scale TMDL: More data (land use, water quality, conservation measures, sources of pollution) and time for local coordination

# TMDL Development

This section will provide process and guidance on how to develop TMDLs with agencies and local partners. Since source analysis has been identified as one of the main needs, this section will provide more detailed guidance. A list of resources that are available to guide technical aspects of TMDL development, as well as check lists and flow charts will be included.

## Overview

A TMDL is developed for waterbodies listed in Category 5 of the Integrated Report or for waterbodies identified as not meeting water quality standards or supporting beneficial uses by another analysis

TMDLs developed for the entire watershed apply to all perennial and intermittent streams within the boundaries of the TMDL

TMDLs are a water quality based approach for restoring water quality that are not meeting water quality standards or protecting beneficial uses

A TMDL includes:

* pollutant source identification,
* pollutant loading capacity to meet the water quality standard or protect beneficial uses,
* load reductions needed to meet the loading capacity,
* allocation of pollutant load to sources,
* implementation strategies,
* priorities for pollutant load reduction (prioritization could be based on BMPs, spatial, funding driven, other drivers such as ESA, protection (rather than restoration), local knowledge, land use, etc.)

Development of a TMDL is a combination of scientific analysis, policy implementation, and regulatory action

## TMDL Elements (Division 42 )

The following elements are required to be included in TMDLs (OAR 340-042-0040(4)):

* Name and location (OAR 340-042-0040(4)(a))
* Pollutant identification (OAR 340-042-0040(4)(b))
* Water quality criteria and beneficial uses (OAR 340-042-0040(4)(c))
* Loading capacity (OAR 340-042-0040(4)(d))
* Excess load (OAR 340-042-0040(4)(e))
* Sources or source categories (OAR 340-042-0040(4)(f))
* Wasteload allocations (OAR 340-042-0040(4)(g))
* Load allocations (OAR 340-042-0040(4)(h))
* Margin of safety (OAR 340-042-0040(4)(i))
* Seasonal variation (OAR 340-042-0040(4)(j))
* Reserve capacity (OAR 340-042-0040(4)(k))
* Water quality management plan (OAR 340-042-0040(4)(l))

These components should be summarized in a table at the beginning of the TMDL document (Table ##)

Table ##.

The following elements are required to be in the Water Quality Management Plan (OAR 340-042-0040(4)(l)

* Condition assessment and problem description (OAR 340-042-0040(4)(l)(A))
* Goals and objectives (OAR 340-042-0040(4)(l)(B))
* Proposed management strategies designed to meet the wasteload allocations and the load allocations in the TMDL (OAR 340-042-0040(4)(l)(C))
* Timeline for implementing management strategies (OAR 340-042-0040(4)(l)(D)) including:
	+ Schedule for revising permits (OAR 340-042-0040(4)(l)(D)(i))
	+ Schedule for achieving appropriate incremental and measurable water quality targets (OAR 340-042-0040(4)(l)(D)(ii))
	+ Schedule for implementing control actions (OAR 340-042-0040(4)(l)(D)(iii))
	+ Schedule for completing other measurable milestones (OAR 340-042-0040(4)(l)(D)(iv))
* Explanation of how implementing the management strategies will result in attainment of water quality standards (OAR 340-042-0040(4)(l)(E))
* Timeline for attainment of water quality standards (OAR 340-042-0040(4)(l)(F))
* Identification of persons, including Designated Management Agencies (DMAs) (OAR 340-042-0040(4)(l)(G))
* Identification of sector-specific or source-specific implementation plans that are available at the time the TMDL is issued (OAR 340-042-0040(4)(l)(H))
* Schedule for preparation and submission of sector-specific or source-specific implementation plans (OAR 340-042-0040(4)(l)(I))
* Description of reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions (OAR 340-042-0040(4)(l)(J))
* Plan to monitor and evaluate progress toward achieving TMDL allocations and water quality standards (OAR 340-042-0040(4)(l)(K)) including:
	+ Identification of persons responsible for monitoring (OAR 340-042-0040(4)(l)(K)(i))
	+ Plan and schedule for reviewing monitoring information and revising the TMDL (OAR 340-042-0040(4)(l)(K)(ii))
* Plan for public involvement in implementing strategies (OAR 340-042-0040(4)(l)(L))
* Descriptionof planned efforts to maintain management strategies over time (OAR 340-042-0040(4)(l)(M))
* General discussion of costs and funding for implementing management strategies (OAR 340-042-0040(4)(l)(N))
* Citation of legal authorities relating to implementation of management strategies (OAR 340-042-0040(4)(l)(O))

## Establishing and working with a local advisory group

The department is required to establish a local advisory group or existing group or forum to assist in developing a TMDL (OAR 340-042-0050(1)).

The purpose of a local stakeholder advisory group:

* WQ issues across the state vary, therefore it is necessary to rely on local knowledge in order to correct WQ impairments in an effective and efficient manner
* When stakeholders are involved in the TMDL development process they will have more ownership for implementation of the TMDL
* Sources of pollutants are better aware of what their responsibilities are for pollutant reduction when they are involved in the TMDL development process

The stakeholder group is the primary method for building partnerships in the watershed for TMDL implementation

The stakeholder advisory group should include interested parties for each sector such as: agriculture, forestry, municipal, environmental groups, watershed councils, point sources, nonpoint sources, planning agencies, state agencies, federal agencies, tribal nations, and funding agencies

The department should review plans with the local stakeholder advisory group and consider input for revision to the TMDL as necessary

### Role of the advisory group

The role of the stakeholder advisory group is that of an advisory group to the department and not a decision making body.

The stakeholder advisory group will provide input on:

* Sources
* Local conditions
* Priority areas
* Types of implementation measures
* Quantify load reductions
* Identify available resources for implementation
* Identify issues and make connections to other important local efforts that could affect water quality or the beneficial uses
* Identify collaborations and opportunities for leveraging of resources for implementation

### Guidelines for selecting stakeholders for the advisory group

Guidelines based on lessons learned from previous TMDL efforts. What worked well in the past? What should be avoided?

* Five types of stakeholders (Watershed Plan Handbook)
* Stakeholders that will be responsible for implementing the watershed plan
* Stakeholders that will be affected by implementation of the plan
* Stakeholders that can provide information on the range of issues, severity of problems, and concerns in the watershed
* Stakeholders that have knowledge of existing programs or plans that you might want to integrate into your plan
* Stakeholders that can provide technical and financial assistance in developing and implementing the plan

### Subcommittees

Subcommittees to the local stakeholder advisory group should be formed as needed. The membership, scope and role of the subcommittee must be well communicated to the subcommittee members and the larger stakeholder advisory group.

Some types of subcommittees could be but not limited to:

* Agriculture – ODA, SWCD, LAC members, and others
* Forestry – ODF, ODFW, WSC, and others
* Point sources – Watershed specific
* Pollutant specific subcommittees, such as system potential vegetation subcommittees for temperature watershed plans– ODA, ODF, SWCD, ODFW, WSC, and others

## Source Assessment

The department is required to identify the pollutant sources (point and nonpoint) and estimate the amount of pollutant loading from these sources (OAR 340-042-0040(4)(f))

* The purpose of source assessment is to identify and quantify any process, practice, activity or resulting condition that causes or may cause pollution of a waterbody
* A source is any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody (OAR 340-042-0030(12))
* Source assessment is an analysis of sources and their cause-effect relationship to the pollution impairment.
* Source assessment process includes:
	+ Identification of each potential source type that could contribute to pollution of waterbody;
	+ Quantification of potential pollutant load from each source; and
	+ Identification of the location of each source
* Use fate/transport simulation methods to:
	+ Establish the linkage among sources and waterbody
	+ Quantify the effect of sources on water quality waterbody

The scale for source assessment of the pollutant should be at the 12 to 14 digit HUC (watershed and subwatershed level scale) for Implementation Ready TMDLs and at the 6 to 8 digit HUC (basin and subbasin scale) for traditional TMDLs

Land use (urban: residential, industrial; agriculture: orchard, row crop, pasture, etc; forest land) and land ownership (forested: federal, state, private industrial, private nonindustrial) shoud lbe considered during the source assessment

Local input is critical, having local stakeholders with ownership of the process and the product will make it easier for TMDL implementation

During this source assessment, water quality data is being compiled and carefully reviewd at a finer scale and more in-depth than during the Integrated Report listing process. The department will evaluate the available data for additional listings or delistings (both spatially and for other pollutants) during the source assessment process

Watershed based TMDLs should apply to perennial and intermittent streams (waters of the state)

he WQMP should state that the potential sources of those pollutants, and the pollutant loads by TMDL listed pollutant(s) identified may not cover all source categories that fall within the DMA’s jurisdiction, it therefore is important to assess whether other sources are likely to exist.

### Data Needed for Source Assessment (TMDL Development)

This section describes the process to review and collect data for source analysis.

There are EPA guidance documents such as Watershed Planning Handbook that can be useful for identifying the data needs for source assessment.

Additional data needs need to be evaluated based on uncertainty in the current data and cost in time and money for collection of additional data

Why is the data needed and what will be accomplished from having additional data needs to be considered, there should be a plan/approach/strategy for collecting data for TMDL development

The general process for data needs for source assessment and TMDL development are:

#### Evaluation of existing data

#### Identify data gaps and additional data needs

#### Collecting additional data

A clear understanding of what any additional data collected would be used for in source assessment or TMDL development needs to be documented and vetted between the Basin Coordinator and the WQ modeler to assure data collected will be useful for its intended purpose

#### Roles of local partners and DMAs

In addition, it is important to be able to consider the following in relation to data

DEQ’s mechanism for collecting, storing and assessing/analyzing data;

what repository is available for outside data that will accommodate spatial and project related information and

what staff or programs within DEQ that are available to assist with this effort.

For TMDL Implementation tracking and program effectiveness monitoring, see 5.2.12 and 5.7

### Identification of pollutant sources

* + - 1. Develop a working conceptual model/s identifying all potential sources (point and nonpoint) and their potential link to the impairment by talking with stakeholders, reviewing the data and relevant literature.
			2. Specific research questions and a working hypothesis should be developed that is to be tested with models or other analytical methods.
			3. Use and application of models should be done in accordance with EPA (2009) - Guidance on the Development, Evaluation, and Application of Environmental Models (EPA/100K-09/003) and Model in Environmental Regulatory Decision Making (NRC 2007).

### Point sources

Potential Point Source Identification. Within the geographic scope of the TMDL, at a minimum, provide:

1. Table of the individual NPDES dischargers including Permit Number, Legal Name, Category, Permit type, receiving waterbody and river mile using the Wastewater Permits Database (termed Source Information System or SIS):
<http://deq05/wq/sisdata/FacilityHomenew.asp>
2. Map of the individual NPDES dischargers using “Effluent Outfall Profiler” using: <http://deq05/wqoutfalls/EOPbasics.aspx>
GIS layer within:
\\deqhq1\gislibrary\Other\_Projects\Water\_Quality\NPDES\_Outfalls\
3. Statement or table of the number of facilities with general NPDES permits summarized by permit type (use SIS database above).
4. Statement or table of the NPDES Municipal Stormwater Permits:
<http://www.deq.state.or.us/wq/stormwater/municipalph1.htm>
<http://www.deq.state.or.us/wq/stormwater/municipalph2.htm>

Initial Point Source Analysis.
Determine if the categories of point sources have the potential to discharge relevant pollutants. If not, provide logic and statement in the TMDL. If point sources have the potential to discharge relevant pollutants, their impact on the receiving waterbody will need to be quantified (i.e. additional source analysis, below).

Evaluation of existing point source data.

1. Individual permits and permit evaluation reports (including results of the reasonable potential anlaysis):
<http://www.deq.state.or.us/wqpermitsearch/>
2. Discharge monitoring reports:
<http://deqapp1/dms/default.aspx>
3. General NPDES permits:
<http://www.deq.state.or.us/wq/wqpermit/genpermits.htm>
For permit evaluation reports, check the web or contact permit staff at headquarters.
4. Other data and reports from facilities.

Roles of facilities:
If there are data gaps, collaboratively develop and impelement monitoring plan.

### Urban stormwater

Urban stormwater not covered by an MS4 Permit (See above for MS4 Permitted facilities) should be evaluated as a source of the TMDL pollutant.

These urban sources should be considered as nonpoint sources for source assessment, TMDL development, and implementation

### Nonpoint sources

Review of data to identify the geographic distribution of pollutant sources with the TMDL area

The scale of identifying the nonpoint sources of the pollutant should be at the 12 to 14 digit HUC (watershed and subwatershed level scale) for Implementation Ready TMDLs and at the 6 to 8 digit HUC (basin and subbasin scale) for traditional TMDLs

In addition to being useful for TMDL development, watershed and subwatershed scale pollutant source identification will be useful for targeting TMDL implementation efforts (see TMDL Implementation Section ##)

If sector or source specific nonpoint source analysis is needed in addition to what’s done for TMDL development, communicate with ODA and ODF about including source analysis as part of their TMDL Implementation strategy. (see timelines and milestones Section ##)

### Air and Land sources

When the department has identified an air or land a source of the TMDL pollutant, the department has the authority to assign a load allocation to that air or land source (OAR 340-042-0040(4)(h))

The regulatory mechanisms for reducing the pollutant load from the air or land source would need to be developed by the Air Quality Program or the Land Quality Program at DEQ, respectively

## Development of the Loading Capacity

The department will develop the loading capacity for the TMDL pollutant.

The department is required to develop the loading capacity so that it specifies the amount of a pollutant or pollutants that a waterbody can receive and still meet water quality standards. The TMDL will be set at a level to ensure that loading capacity is not exceeded. Flow assumptions used in the TMDL will be specified (OAR 340-042-0040(4)(d))

The process to determine loading capacity for a waterbody is both site and pollutant specific, but some common components of the process are:

* What is the limiting water quality condition or critical conditions?
* What are the primary processes influencing loading capacity?
* What are the methods to be used to estimate loading capacity?

Where there is difference between the Integrated Report listing criteria and the water quality standard(s) the loading capacity, allocations, load allocations, and wasteload allocations must be developed to meet the water quality standards (OAR 340-042-0025(1))

## Strategies for Assigning Pollutant Allocations

Pollutant allocations can be assigned to point sources as wasteload allocations or to nonpoint sources as load allocations.

The department distributes the wasteload and load allocations among identified sources and may consider the following factors (OAR 340-042-0040(6)):

* Contributions from sources(OAR 340-042-0040(6)(a))
* Costs of implementing measures(OAR 340-042-0040(6)(b))
* Ease of implementation(OAR 340-042-0040(6)(c))
* Timelines for attainment of water quality standards(OAR 340-042-0040(6)(d))
* Environmental impacts of allocations(OAR 340-042-0040(6)(e))
* Unintended consequences(OAR 340-042-0040(6)(f))
* Reasonable assurances of implementation(OAR 340-042-0040(6)(g))
* Any other relevant factor(OAR 340-042-0040(6)(h))

The pollutant allocation is a policy decision on how to apportion the available loading capacity for the TMDL pollutant

The loading capacity is a technical analysis of the waterbody’s assimilative capacity for the TMD L pollutant in relation to the water quality standard

### Assign Load Allocations

The department assigns load allocations.

The load allocation is the portions of the receiving water's loading capacity that are allocated to existing nonpoint sources of pollution or to background sources. Load allocations are best estimates of loading, and may range from reasonably accurate estimates to gross allotments depending on the availability of data and appropriate techniques for predicting loading. Whenever reasonably feasible, natural background and anthropogenic nonpoint source loads will be distinguished from each other. (OAR 340-042-0040(4)(h))

Load allocations can be assigned to nonpoint sources as a general category (traditional TMDL) or to a specific nonpoint source sector or to a specific nonpoint source (Implementation Ready TMDLs) (OAR 340-042-0030(10)&(11)&(12)

Load allocations and load reduction goals in the TMDL should be developed based on HUC 12 to 14 source information (IR TMDLs)

### 4.6.1.1 Involving local partners in LA assignment

The department involves local stakeholders for allocating loads.

4.6.1.2 Use of surrogates for LAs

Surrogates can be used for load allocations

Surrogate measures are substitute methods or parameters used in a TMDL to represent pollutants (OAR 340-042-0030(14))

The department with the local stakeholder advisory group can identify surrogate measures and conditions that will lead to attainment of TMDL load allocations. One , but not the only, process for selection of surrogate measures is:

* Select surrogate measures and conditions [OAR340-042-0040(5)(b), (6)]
* Determine specific amount of surrogate measures needed to achieve TMDL goals [OAR340-042-0040(4)(l)(C), (5)(b)]
* Facilitate stakeholders taking ownership of the TMDL implementation [OAR 340-042-0040(4)(l)(L) and (M)]

## 4.6.2 Assign Waste Load Allocations

The department assigns wasteload allocations

* The wasteload allocation is the portion of the receiving water’s loading capacity that are allocated to the existing point sources of pollution, including all point source discharges regulated under the Federal Water Pollution Control Act Section 402 (33 USC Section 1342)(OAR 340-042-0040(4)(g))
* TMDL development staff (WQ modeler and BC) need to work the permit writer when developing the WLA to ensure there is a clear understanding of how the WLAs are being developed.
* The duration and frequency that the WLAs are expected to be met needs to be clearly explained in the TMDL so that WLAs can be easily translated into permit limits.
* Efforts should be made to maintain consistency among TMDLs and their WLAs so that it is easier to implement them in permits.
* Permit limits should not be included in the TMDL.
* The DEQ staff (TMDL development staff and permit writer) need to communicate and work with the permittee via the stakeholder process so that the permittee is aware of how the WLA is being developed and how that will be translated into the permit as effluent limits
* In addition to the factors allowed to be considered for wasteload allocations (OAR 340-042-0040(6)) **EPA has identified a variety of methods for allocating wasteloads amongst point sources. The various approaches are:**

|  |
| --- |
| Wasteload Allocation Methods 1 |
| 1. | Equal percent removal (equal percent treatment) |
| 2. | Equal effluent concentrations |
| 3. | Equal total mass discharge per day |
| 4. | Equal mass discharger per capita per day |
| 5. | Equal reduction of raw load (pounds per day) |
| 6. | Equal ambient mean annual quality (mg/l) |
| 7. | Equal cost per pound of pollutant removed |
| 8. | Equal treatment cost per unit of production |
| 9. | Equal mass discharged per unit of raw material used |
| 10. | Equal mass discharged per unit of production |
| 11a. | Percent removal proportional to raw load per day |
| 11b. | Larger facilities to achieve higher removal rates |
| 12. | Percent removal proportional to community effective income |
| 13a. | Effluent charges (pounds per week) |
| 13b. | Effluent charge above some load limit |
| 14. | Seasonal limits based on cost-effectiveness analysis |
| 15. | Minimum total treatment cost |
| 16. | Best Available Technology (BAT for industry) plus some level for municipal inputs |
| 17. | Assimilative capacity divided to require an "equal effort among dischargers" |
| 18a. | Municipal: Treatment level proportional to plant size |
| 18b. | Industrial: equal percent between best practicable technology (BPT) and BAT |
| 19. | Industrial discharges given different treatment levels for different stream flows and seasons |
| 1 Source: Chadderton, R., Miller, A. and A. McDonnell, 1981. Analysis of Wasteload Allocation Procedures. Water Resources Bulletin 17(5):760-66. (As cited in EPA's [Technical Support Document for Water Quality-based Toxics Control (PDF)](http://www.epa.gov/npdes/pubs/owm0264.pdf) (26.6 Mb, 335 pages), 1991 (EPA/505/2-90-001).) |

### 4.4.2.5 Flow/ Water Quantity

Flow is a critical component for calculation of loading capacity, load allocations, and wasteload allocations for the TMDL pollutant(s)

The loading capacity analysis and allocations use a flow level for calculation of loading capacity and this flow level could be used for the flow targets.

Instream flow could be used as a load allocation surrogate with “where feasible” caveat.

DEQ’s current policy for flow protection is:

* for the department to apply for in-stream water rights (OAR 690-077),
* voluntary efforts and
* the Integrated Water Resources Strategy.

The department does not name OWRD a DMA for flow

## Set Margin of Safety

A margin of saety is required for TMDLs

The margin of safety accounts for uncertainty related to the TMDL and, where feasible, quantifies uncertainties associated with estimating pollutant loads, modeling water quality and monitoring water quality. The TMDL will explain how the margin of safety was derived and incorporated into the TMDL (OAR 340-042-0040(4)(l))

The margin of safety can be either explicit (a specific quantity such as a percentage or quantity of a load) or implicit (using conservative estimates that increase loads from potential sources).

The explicit margin of safety is straight forward and easy to understand, but these values are often difficult to relate to specific uncertainties in the TMDL development process. T

he implicit methods lack the simplicity of the explicit method, but are often more easily understood and able to relate to uncertainties of input data.

## Address Seasonal Variation

The TMDL must address seasonal variation.

Seasonal variation accounts for seasonal variation and critical conditions in stream flow, sensitive beneficial uses, pollutant loading and water quality parameters so that water quality standards will be attained and maintained during all seasons of the year (OAR 340-042-0040(4)(j))

Critical conditions may occur at different time during the year and dominant process control pollutant levels vary through the year. These processes include both natural and anthropogenic.

## Reserve Capacity

The TMDL can assign a portion of the loading capacity to reserve, called reserve capacity

Reserve capacity is an allocation for the increases in pollutant loads from future growth and new or expanded sources. The TMDL may allocate no reserve capacity and explain that decision (OAR 340-042-0040(4)(k))

Traditionally reserve capacity has been set aside for unidentified or future point sources

There has been increasing interest among certain types of nonpoint sources to be allowed to apply for reserve capacity

Also, the TMDL should identify how reserve capacity is to be allocated to sources:

* First come first served
* Current need
* Future need
* Economic hardship

## Reasonable Assurance

A “Reasonable Assurance” rationale must be included in the TMDL document for IR TMDLs in addition to being included in the WQMP.

“Reasonable Assurance” is required as part of the Water Quality Management Plan (Section 5.4) according to OAR 340-042-0040(4)(l)(J).

Legal basis for inclusion of “Reasonable Assurance” in the TMDL:

Reasonable assurance is implicitly required as part of CWA 303(d)(1)© and 301(b)(1)(C). Sdction 303(d)(1)(C) requires that a TMDL be “established at a level necessary to implement the applicable water quality standards (See also 40 CFR 130.7(c)(1). A TMDL calculates the maximum amount of pollutant loadings a waterbody can receive and still meet water quality standards. Allocation of load between point and nonpoint sources is a policy decision (See Section ####). Section 303(d)(1)(C) requires that the point source-nonpoint source split be at a level necessary to implement the applicable water quality standards. Without a demonstration in the TMDL of “Reasonable Assurance” that the nonpoint source load allocation will be met, there is no assurance that the TMDL equation will add up to a sum that does not exceed a level necessary to implement the applicable water quality standards.

Section 301(b)(1)(C) and EPA’s permitting regulations (CFR???) provide additional support for including “Reasonable Assurance” in a TMDL. Section 301(b)(1)(C) requires that point source permits have effluent limits as stringent as necessary to meet water quality standards. EPA’s permitting regulations echo that requirement and, in addition, require that permits include effluent limits consistent with the assumptions and requirements of any available wasteload allocation for the discharge approved by EPA (40 CFR 122.44(d)(1)(vii)(A)&(B)). For WLAs to serve as a basis for a WQBEL, they must be stringent enough so that with the waterbody’s other loadings they meet water quality standards. IN the absence of “Reasonable Assurance” that a TMDLs Las will be met the TMDLs WLAs cannot serve as an effective permitting guide. That can happen if: 1) the TMDLs combined nonpoint source Las and point source WLAs do not exceed water quality standard based loading capacity, and 2) there is “Reasonable Assurance” that the LA will be achieved. Such a demonstration ensures that an effluent limitation that is consistent with a TMDLs WLA pursuant to CFR 122.4(d)(1)(vii)(B) will also meet water quality standards as required by CWA 301(b)(1)(C) and CFR 122.44(d)(1)(vii)(A).

# WQMP

This chapter provides guidance on what elements are included in Water Quality Management Plan (WQMPs)and how those elements are collected and developed with agencies and local partners. Subsections that address shortcomings of the current WQMPs will provide detailed guidance.

## Overview

The Water Quality Management Plan (WQMP) is an element of a TMDL developed by DEQ as a broad strategy for implementing TMDL allocations to protect designated beneficial uses such as aquatic life, water contact recreation, and drinking water supplies. The primary focus of WQMP is nonpoint source pollution.

OAR 340-042-0040-(4)(l) states the following:

(l) Water quality management plan (WQMP). This element provides the framework of management strategies to attain and maintain water quality standards. The framework is designed to work in conjunction with detailed plans and analyses provided in sector-specific or source-specific Implementation Plans.

For both Basin Scale and Implementation Ready TMDLs, the WQMP should provide the following:

* Surrogate measures that are clear and easily applied to meet TMDL load allocations
* Information that could be used to identify priority areas for implementation or
* Identify management measures needed to achieve TMDL goals,
* Identify the most effective BMPs for meeting TMDL LA and WLA,
* Set where and when management measures and restoration projects will be implemented to meet water quality restoration milestones,
* Identify the load reduction that is expected and provide estimated load reduction by BMP and pollutant type
* Develop plans for implementation effectiveness monitoring and tracking,
* Ensure the monitoring of management measure installation and effectiveness and a process for evaluating management measures and updating them, if necessary,
* Estimate costs associated with implementation,
* Determine adequacy of DMA implementation strategies for meeting load allocations,
* Select implementation strategy that will provide reasonable assurance for achieving water quality goals, and
* Individual load allocations are given to significant air deposition and land sources of pollutants subject to TMDLs.

The WQMP should include descriptions of the broad categories of restoration and protection, including long-term vision categories.

* Plans should address either or both, *passive* and *active* restoration, as appropriate
* Plans should address structural and programmatic BMPs (Don has discussion of this in 6.3.1A)
* In addition to addressing existing problem, attainment of load allocations requires looking ahead (e.g., it is much easier to establish a riparian ordinance for future development than to try to fix things while or after development has occurred)
* Plans should state limiting factors, and whether they are short or long term (e.g., future bridge repair needs may be an opportunity for reconfiguration of the bridge for  less channel impact)

## WQMP Elements (Division 42)

The following are WQMP elements as they appear in Division 42 TMDL rule. The description of these elements in Division 42 TMDL rules clarify DEQ’s expectations for the level of detail needed in WQMPs for management strategies and milestones.

### Condition assessment and problem description.

* Reference sections of TMDLs with detailed condition assessment and problem description.
* Summarize conditions and problems that are described in TMDLs.
	+ Impaired beneficial uses
	+ Cause of impairment
	+ Pollutant

### Goals and objectives

* Include the overarching goal as implementing the TMDLs to meet the WQS and restore impaired uses.
* List objectives that are applicable to the TMDL and measurable.
* Include both, *passive* and *active* restoration, as appropriate
* Include prevention (e.g. it is much easier to establish a riparian or LID ordinance for future development than to restore and retrofit)

### Proposed management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category.

* See 5.5 and 5.6 for full discussion

### Timeline for implementing management strategies including:

1. Schedule for revising permits
2. Schedule for achieving appropriate incremental and measurable water quality targets,
3. Schedule for implementing control actions, and
4. Schedule for completing other measurable milestones.
* See 5.4 for full discussion

### Explanation of how implementing the management strategies will result in attainment of water quality standards

* This section focuses on describing the TMDL technical analysis.
* Provide supporting technical analysis and logical reasons why implementing the strategies in WQMP will result in attainment of water quality standards.
* Explain that, if DMAs and permit holders are able to meet their LA and WLA, the waterbody should be able to meet water quality standards.
* There is no need to cover reasonable assurance for implementation in this section.

### Timeline for attainment of water quality standards

* Timelines vary depending on pollutant sources and the extent of impairment. There should be a specific date (or set of dates)

### Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans.

* Under Division 42, EQC defines “Designated Management Agency (DMA)" as a federal, state or local governmental agency that has legal authority over a sector or source contributing pollutants, and is identified as such by the Department of Environmental Quality in a TMDL.
* DEQ generally appoints agencies that have legal authority, such as Departments of Agriculture, State Lands, Forestry, and Transportation, as well as local governments and federal land management agencies.
* Include a list of DMAs with applicable pollutants, and state DEQ’s expectations for the DMA.
* In some cases, DEQ staff and managers may exempt DMAs from developing TMDL implementation plans due to inadequate resources for providing technical assistance. DEQ will select those DMAs by taking the following factors into consideration.
	+ Pollutant load
	+ Administrative Capacity of the DMA
	+ Projection of future development

### Identification of sector-specific or source-specific implementation plans that are available at the time the TMDL is issued.

* Communicate with DMAs and HQ NPS program in advance and ensure inclusion of all existing implementation plans.
* Include a list of existing memoranda of Agreements with DMAs.

### Schedule for preparation and submission of sector-specific or source-specific implementation plans by responsible persons, including DMAs, and processes that trigger revisions to these implementation plans

* Submission date of implementation plans needs to be explicitly stated in the WQMP.
* Submission dates are generally due to DEQ 18 months after TMDLs are issued for Basin Scale TMDLs.
* For Implementation Ready TMDLs, the submission dates may vary to accommodate local stakeholder processes.

### Description of reasonable assurance that management strategies and sector specific or source specific implementation plans will be carried out through regulatory or voluntary actions.

* See 5.3 for full discussion.

### Plan to monitor and evaluate progress toward achieving TMDL allocations and water quality standards including:

1. Identification of persons responsible for tracking and monitoring implementation, and
2. Plan and schedule for reviewing monitoring information and revising the TMDL
* See 5.8 for full discussion

### Plan for public involvement in implementing management strategies.

* During TMDL development, discuss with local stakeholder group about the level of DEQ resources that are available for the TMDL area.
* Include the role of DEQ in implementing management strategies as well as the level of staff involvement that the Agency will commit.

### Description of planned efforts to maintain management strategies over time.

* Describe ongoing efforts such as periodic review of TMDLs, permits, AgWQM Area Plans and Rules, and implementation plans.
* Discuss with management to determine the level and role of staff commitment expected for the TMDL area.
* Clearly describe expected DEQ role and resources for reviewing DMA reports and biennial reviews of AgWQM Area Plans and Rules.

### General discussion of costs and funding for implementing management strategies. Sector-specific or source-specific implementation plans may provide more detailed analyses of costs and funding for specific management strategies.

* Discuss the need and importance of prioritization both for TMDLs to be done and implementation projects within a basin. Estimates of needed funding for NPS implementation in relatively small watersheds is often tens of millions of dollars. Even with effective leveraging of funding from other sources such as BEF or OWEB funds, there is still an extremely large difference between available funds and needed funds.
* Discuss how to determine costs for restoration.
* Include a list of both local and national potential funding sources, and potential partners.
* Provide references for assessing costs for management strategies.

### Citation of legal authorities relating to implementation of management strategies.

* Include a list of legal authorities DEQ and DMAs operate under to implement management strategies for the purpose of meeting TMDL load allocations.
* A specific citation of DEQ’s authority for enforcing implementation activities at the land owner level is provided below.

## Reasonable Assurance

“Reasonable Assurance” is required as part of the Water Quality Management Plan according to OAR 340-042-0040(4)(l)(J). In addition, Reasonable assurance is implicitly required as part of CWA 303(d)(1)(c) and 301(b)(1)(C).

* Section 303(d)(1)(C) requires that a TMDL be “established at a level necessary to implement the applicable water quality standards (See also 40 CFR 130.7(c)(1)).
* Allocation of load between point and nonpoint sources is a policy decision. Section 303(d)(1)(C) requires that the point source-nonpoint source split be at a level necessary to implement the applicable water quality standards.

Without a demonstration in the TMDL of “Reasonable Assurance” that the nonpoint source load allocation will be met, there is no assurance that the TMDL equation will add up to a sum that does not exceed a level necessary to implement the applicable water quality standards.

Reasonable assurance could be provided through a variety of ways through voluntary and regulatory programs.

### Oregon’s Section 319 Management Plan

* Explain that DEQ and its partners in Oregon have various programs that provide the following in order to control nonpoint sources of pollution.
	+ Financial incentives
	+ Technical assistance
	+ Educational programs.
* Acknowledge that estimates of needed funding for NPS implementation in even relatively small watersheds is easily tens of millions of dollars, and that available funds, even with effective leveraging of funds from other sources, do not cover all the needed funds. Emphasize that DEQ addresses shortage of funding for watershed restoration by allocating its resources to prioritize TMDL development schedule and implementation projects within a basin.

### DEQ’s regulatory authority

* Oregon’s Department of Justice, attorney general’s office provided a memo describing the relationship of ODA and ODF’s regulatory authorities, and DEQ’s backup authorities for nonpoint source pollution management. See Section 2.2 for references to include in this element of WQMP that demonstrate regulatory certainty.
* Explain that DEQ relies on and has authority to require DMAs to develop TMDL implementation plans and implement management strategies that are specified in the implementation plans.
* State that DEQ begins enforcement process by issuing a Warning Letter if DMAs do not submit Implementation Plan or implement management strategies in a timely manner.

###  Documenting local partnerships and ongoing implementation efforts to provide reasonable assurance

* Explain that ongoing implementation efforts, local ordinances, and area specific regulatory enforcement tools to implement TMDLs contribute to provide reasonable assurance.
* Reference EPA guidance for Developing Watershed Plans

## Setting Timelines and Milestones

Include specific implementation timelines and associated milestones in all WQMPs

* Determine timelines and milestones with DMA and local stakeholder input during TMDL development process. (See flowchart) Milestones will be set for both instream WQ and practices. Administrative capacity and resources should be considered.
* Timelines should be developed for meeting interim goals, benchmarks, and meeting load allocation. Goals and benchmarks need to be measurable.
* Timelines in WQMP should be developed so that they are available for DMAs to develop their sector or source specific Implementation Plans.
* Timelines for new permits and approval of implementation plans should also be included in this section.
* Include a clear goal under timeline element, e.g. a water quality target o achieve at a designated time, such as 5% digression rate of bacteria criterion by end of year 3 of implementation.
* Milestone - the end of a stage that marks the completion of a work package, such as install stream fencing along 50% of pasture land with stream access.
* See chapter 12 of Watershed Plans Handbook for further discussion
* See 5.8 for full discussion of Monitoring and evaluation of goals and milestones

### Considerations and process for setting permit schedule

* Any suggestions from Steve or Greg?

### Considerations and process for working with local partners to set timelines and milestones

* Timelines and milestones in WQMPs affect how DMAs and permit holders set their goals for TMDL implementation.
* Assess technical assistance needed to support DMAs to meet timelines and milestones
* Identify potential funding sources and estimate available funds for local partners
* Evaluate the feasibility of local partners’ ability to meet project milestones
* Reference EPA guidance for Developing Watershed Plans

## Potential Pollutant Reduction Strategies

* TMDL rule states that “proposed management strategies must be designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category. "
* To reduce pollutant loads for Nonpoint Sources, work with local partners and DMAs to develop and select strategies for meeting sector specific load allocations.
* Identify BMPs and conservation actions from DMAs and other partners. Include BMPs proposed or already implemented.
* Evaluate BMP effectiveness – this means evaluation of the proposed BMPs and their sufficiency to meet the load allocations and address pollutants of concern.
* Quantify BMPs into acres, units, and/or design specification that are needed to meet Load Allocations. BMPs should be quantified by DMA and watershed.
* Identify priority areas for implementation of BMPs – consideration should be given to pollution reduction per unit of investment, existing local priorities or restoration plans, local capacity and willingness for implementation, or other key considerations.

### Pollutant reduction for Point Sources

* Coordinate with other DEQ programs to plan pollutant reduction from point sources during TMDL development. Include general discussion of the coordination in WQMPs.

#### Permit renewal

* + Work with regional permit writers to plan for permit renewal with TMDL WLA in mind. Make sure to engage appropriate point sources in Local Stakeholder Groups. See Chapter 4 for full discussion.

#### Trading

* + Always consider trading as a potential tool to reduce pollution during TMDL development. See Trading IMD for full discussion.

#### Air sources

* + When air sources are identified as a potential source for water quality impairment, work with Air Quality Division to explore the possibility of air modeling and analysis. If preliminary analysis suggest a significant load from air sources, involve Air Quality Division staff in TMDL development process.

### Pollutant reduction through other programs

* Coordinate with other DEQ programs to plan pollutant reduction during TMDL development. Include general discussion of the ongoing coordination in WQMPs.

#### Source Water Protection

#### §401 Water Quality Certifications

#### Pretreatment

#### Air and land quality programs

#### Integrated Water Resource Strategies

## Funding

In general, there is a large gap between needed and available resources for watershed restoration. Estimates of needed funding for NPS implementation in even relatively small watersheds is easily millions of dollars. DEQ’s analysis of funding needs for the Willamette Basin for riparian restoration alone was estimated to be in the billions.

 319 monies received annually for the entire state equal roughly $1.5 million and must cover project, design, technical assistance and education costs. Even with effective leveraging of funding from other sources such as BEF or OWEB funds, there is still an extremely large difference between available funds and needed funds. Therefore, there is a need for, and it is critical for DEQ to lead and participate in prioritization of implementation projects within area with TMDLs.

* Include a list of local, regional, and national funding resources.
* If applicable, include DEQ’s funding sources for watershed work such as 319, SRF Stewardship Option, Safe Drinking Water Act funds, and EPA TMDL funds.
* Engage funding agencies and entities in TMDL process as it is critical to align priorities as much as possible.

## Monitoring and Adaptive Management

In WQMP, Describe how DEQ will review the implementation activities outlined in the WQMP and determine whether TMDLs need to be revised. See Figure 13-2 of EPA’s NPS Watershed Handbook.

* Include discussion on types of monitoring that will be necessary to determine implementation progress and trend toward attainment of water quality criteria. Generally there are three types of monitoring that can support evaluation of goals and milestones.
1. Implementation monitoring – this category includes monitoring that is designed to answer the question “Did we accomplish what we said we would in the manner, time, and budget proposed?” This type of monitoring is generally directed toward specific management changes or implementation activities. In WQMP, provide a general implementation monitoring plan that can measure progress toward goals
	* Define what management measures will be monitored (can add over time)
	* Define parameters to track for each management measure
	* Develop data collection and storage methods
	* Assign responsibility to parties who will collect, store, and report data
	* Develop project management charts to assess work flows
	* Select analysis methods to assess if milestones are met
2. Effectiveness monitoring – this category of monitoring is designed to determine how well what we did worked, to answer the question: did the project achieve the objective it was designed to meet? Often there are several different ways of working toward a certain goal, some of which will achieve greater improvement than others. In WQMP, include a general water quality monitoring program that can measure progress toward goals. If available when WQMPs are being drafted, include details such as:
	* Locations of potential monitoring sites
	* Conditions (hydrologic, seasonal, land management) when samples will be collected
	* Minimum sample size needed to assess if goal is met
	* Technical needs for collection and analysis of samples
	* Responsibility to parties for collecting, astorage, and transfer of samples for analysis
	* Who is responsible for analysis of sample results
	* Data analysis methods to be used to assess if goal is met
3. Validation monitoring – this category of monitoring is designed to answer the question “Were the original assumptions we made correct?” During a TMDL process, assumptions about how a watershed functions are often made based on available data and best professional judgment. Collection of additional data helps to increase our understanding of environmental processes and can be used to better inform the original assumptions.
* Be clear about DEQ’s resources for monitoring when communicating to local stakeholders, and explicitly state in WQMP.
* Include DEQ’s expectations for monitoring for DMAs, permittees, and other local partners.

# TMDL Implementation

TMDL Implementation requires joint effort between point and nonpoint sources. TMDL implementation is accomplished through renewal and implementation of permits that reflect waste load allocations, implementation of various implementation activities by DMAs, and efforts by local partners that contribute to pollutant load reductions.

This chapter focuses on TMDL implementation for nonpoint sources, and sets guidelines for providing technical assistance to DMAs and local partners, evaluating and approving implementation plans for both Implementation Ready and Basin Scale TMDLs, and assessing an overall progress toward achieving TMDL goals using TMDL implementation information.

## Overview

OAR 340-042-0080(1)states:

Implementing a Total Maximum Daily Load

(1) Management strategies identified in a WQMP to achieve waste load and load allocations in a TMDL will be implemented through water quality permits for those sources subject to permit requirements in ORS 468B.050 and through sector-specific or source-specific implementation plans for other sources. WQMPs will identify the sector and source-specific implementation plans required and the persons, including DMAs, responsible for developing and revising those plans.

For nonpoint sources, designated management agencies (DMAs) are required to submit TMDL implementation plans to DEQ for approval as part of the WQMP framework unless specified in a state statute and Division 42 TMDL rule. TMDL implementation plans can be a TMDL-specific document or parts of existing plans or programs that contain the essential elements of TMDL planning as specified in the rule and in the Chapter.

For both Basin Scale and Implementation Ready TMDLs, TMDL Implementation plans are required to include the following elements under Division 42 TMDL rule 340-042-0080(3).

(A) Identify the management strategies the DMA or other responsible person will use to achieve load allocations and reduce pollutant loading;

(B) Provide a timeline for implementing management strategies and a schedule for completing measurable milestones;

(C) Provide for performance monitoring with a plan for periodic review and revision of the implementation plan;

(D) To the extent required by ORS 197.180 and OAR chapter 340, division 18, provide evidence of compliance with applicable statewide land use requirements; and

(E) Provide any other analyses or information specified in the WQMP.

* Although the TMDL rule guides TMDL implementation plans to include important elements, supplement the list by including the following elements in the WQMP. The following guidance in the WQMP will ensure that TMDL implementation plans include necessary information for the DMAs to be strategic and for evaluation of TMDL implementation efforts.
* priority areas for implementation
* management measures needed to achieve TMDL goals, considering both passive and active restoration as well as prevention
* where and when management measures and restoration projects will be implemented to meet water quality restoration milestones,
* plans for implementation tracking and effectiveness monitoring
* estimated costs associated with implementation
* reasonable assurance for achieving load allocation applicable to DMA
* limiting factors, and whether they are short or long term (e.g., future bridge repair needs may be an opportunity for reconfiguration of the bridge for  less channel impact)

## Designated Management Agencies (DMAs) and their Programs for implementing TMDLs

This section describes designated management agencies’ programs for implementing TMDLs.

### Department of Environmental Quality (DEQ)

* DEQ issues NPDES permits to permittees. When TMDLs are developed, waste load allocations are incorporated as effluent limites to NPDES permits.
* See NPDES related IMDs for full discussions.
* DEQ also issues §401 WQ Certifications. Where there are approved TMDLs, DEQ takes Load allocations into consideration when issuing WQ certifications.

### Local Governments and municipalities

* Oregon cities and counties have authority to regulate land use activities through local comprehensiveplans and related development regulations or ordinances. This authority begins with a broad charge given to them by the Oregon Constitution and the Oregon Legislature to protect the public’s health, safety, and general welfare.
* As part of TMDL implementation effort, DMAs such as municipalities and cities develop programs, ordinances and codes as TMDL implementation strategies.
* In addition to establishing local regulations, local governments and municipalities are expected to conduct its operations and manage lands under their jurisdiction to meet load allocations.

### Department of Forestry (ODF)

* ODF regulates commercial forest practices under Oregon Forest Practices Act. There is a provision for establishing basin specific rules if existing rules are not sufficient to meet TMDL load allocations or water quality standards. DEQ and ODF coordinate TMDLs through a 1998 Memorandum of Agreement (MOA). The MOA is currently being updated.
* ODA also manages some state owned lands. (check)

### Department of Agriculture (ODA)

* ODA is the DMA responsible for regulating agricultural activities that affect water quality. DEQ and ODA coordinate TMDLs and agricultural planning through a 1998 Memorandum of Agreement (MOA). The MOA is currently being updated.
* ODA has authority to develop state specific pesticide labels for current use pesticides. Depending on the pollutant, ODA Pesticide program may be involved in addition to ODA’s Water Quality Program to strategize pollutant reduction to meet load allocations.

### Department of State Lands (DSL)

* As a regulatory agency, DSL is responsible for administration of Oregon's Removal-Fill Law to protect, conserve and allow the best use of the state's water resources. It generally requires a permit from DSL to remove, fill or alter more than 50 cubic yards of material within the bed or banks of waters of the state.

### Federal Land Management Agencies such as Bureau of Land Management (BLM) USDA Forest Service (USFS) and US Fish and Wildlife Service (USFWS)

* USFS and BLM issue various leases and approves plan of operations. Those leases and plan of operations should take TMDL load allocations into consideration.
* BLM and USFS also have MOA and MOU with DEQ, and develop and submit TMDL Implementation Plans called Water Quality Restoration Plans for DEQ approval.

### Oregon Department of Transportation

## Other programs that support goals of TMDLs

There are many programs that share similar goals to the TMDL program. The following are a few examples of those programs.

### Oregon Plan for Salmon and Watersheds

In 1997, the Oregon Legislature and Governor established the Oregon Plan for Salmon and Watersheds in order to protect populations of various salmonid species with the support and participation of a wide spectrum of stakeholders from all sectors and regions of the state. The effort is still being made today.

### Oregon Conservation Strategies

Oregon Conservation Strategy provides information on at-risk species and habitats, identifies key issues affecting them, and recommends actions. The Strategy could be considered when identifying priority areas for TMDL implementation.

### Integrated Water Resource Strategy

## Applicable DMAs (When to require DMAs to develop implementation plans)

Municipalities, counties, federal lands, and state lands not applicable to FPA and Area Plans and rules need to have implementation plans unless stated otherwise in TMDLs.

The TMDL WQMP section of a TMDL identifies the entities, called DMAs, which are required to develop and implement plans if their TMDL responsibilities are not already addressed through a prescribed approach or ORS 468B.050 permit requirement.

* This most commonly includes cities, counties, U.S. Forest Service, and U.S. Bureau of Land Management, but may also apply to other DMAs that manage significant tracts of land within TMDL boundaries or are otherwise identified as having a significant role in achieving water quality improvements.
* These could include irrigation or drainage districts, U.S. Fish and Wildlife Service (wildlife refuges), National Park Service, U.S. Army Corps of Engineers, etc.
* DMAs are only responsible for land use activities under their jurisdiction.

## Compliance and Enforcement

When DMAs do not voluntarily comply to implement TMDLs, DEQ may take enforcement actions for DMAs other than ODA and ODF. The real intent is to work cooperatively with DMAs, including assisting them in developing their plans and working through implementation issues. It is DEQ’s goal that this partnership approach will foster incentives for DMAs to implement the TMDL. Enforcement would only be used as measure of last resort when cooperative endeavors are not successful. Those two agencies and DEQ have statutory relationships and there are different processes for the agencies to resolve conflict.

These proposed DEQ enforcement actions do not apply to activities under the control of the Oregon Department of Agriculture and the Oregon Department of Forestry. This is consistent with the Total Maximum Daily Load Rule, OAR 340-042-0080.

The TMDL is issued as an Order and identifies all DMAs required to submit a TMDL Implementation Plan and when each TMDL Implementation Plan must be submitted to DEQ for approval. The DMA has 60 days from the issuance of the TMDL to appeal the issuance of the TMDL.

***Step 1:  Notification to DMA****.*

* Within 20 days of issuing the TMDL, DEQ sends a letter to each DMA indicating when a TMDL Implementation Plan must be submitted to DEQ. The due date is specified in the TMDL.

***Step 2:  Interim Activities Until Due Date of TMDL Implementation Plan****.*

* After Step 1 and until the TMDL Implementation Plan is due, the DEQ TMDL basin coordinator will periodically check in with each DMA to determine progress and provide technical assistance as necessary.  If there are indications that a DMA will not meet the due date for Plan submission to DEQ, DEQ will send a letter to the DMA to explain DEQ’s concerns.
* If it is beyond the DMA’s reasonable control to meet the submission deadline, DEQ may consider entering into a Mutual Agreement and Order that would give the DMA more time to develop its Plan. DEQ staff should confer with OCE before offering to negotiate a MAO with a DMA.

***Step 3:  Warning Letter with Opportunity to Correct.***

* Failure of the DMA to submit its TMDL Implementation Plan on time is a Class II violation. Class I violations are considered to be the most serious violations and Class III violations are the least serious.
* The enforcement guidance requires DEQ to send the DMA a Warning Letter with Opportunity to Correct requesting that the DMA submit a Plan or an acceptable proposed schedule for completion of a Plan by a specified date.
* The Warning Letter states that if the DMA does not correct the violation, the violation may be referred for formal enforcement action that could include civil penalties and a compliance order. (Note:  If the plan is not received by DEQ by the requested time, then Step 4 will be instituted.  Moreover, if the response to the Warning Letter includes an unacceptably long alternative schedule, a follow-up letter will be sent indicating that the DMA needs to modify its schedule.
* Finally, if the DMA does not submit a new date, DEQ will identify a new submittal date in a Department Order (Step 5).

***Step 4:  Pre-Enforcement Notice.***

* If the TMDL Implementation Plan is not submitted within the period indicated in the Warning Letter, or if the response is inadequate, DEQ will send the DMA a Pre-Enforcement Notice.  This letter indicates that the matter has been referred to DEQ’s Office of Compliance and Enforcement for formal enforcement action that may include issuance of a civil penalty assessment and a Department Order.
* Concurrent with the Pre-Enforcement Notice, DEQ staff will send an enforcement referral to DEQ’s Office of Compliance and Enforcement.

## Evaluating the adequacy of Implementation Plans

Reference TMDL Implementation Guidance (2002) as well as Coastal Zone Implementation IMD

From WR below

* Urban DMAs—regardless of size—must address and meet requirements of all 6 minimum stormwater control measures (i.e. illicit discharge, municipal operations, post construction runoff, etc.) described in more detail in the first cycle of the NPDES MS4 Phase II Permit.
* Basin Coordinator should use checklist (developed by Nancy Gramlich and refined by NPS staff and basin coordinators—reference location) to ensure that the minimum requirements have been met.
* The six minimum measures should be phased in through time depending on population size of DMA, their contribution to the pollution problem, rate at which problem is growing, etc.
* WQMP should be clear that each urban or county DMA is intended to achieve the equivalent of a MS4 community, but requirements are to be suitable to their contribution to the problem.
* DMA implementation matrix should have milestones that are tangible.

From coastal TMDL guidance below

* Once the TMDL Implementation Plan has been received, DEQ will use the following criteria to determine the adequacy of the plan for approval:
* Must meet all of TMDL rule elements,
* Meet all WQMP requirements
* Addresses all the potential sources of pollution within their jurisdiction of the plan (or referenced in other plans and/or permits),
* The management strategies are reasonably expected to be effective, and
* The DMA demonstrates how the TMDL load allocations will be achieved.
* Are Exemptions Available? (Coastal and current 2007 Implementation Plan Guidance)
* DEQ prefers to work with smaller DMAs to develop a customized TMDL Implementation Plan suited to the magnitude of their contribution to the problem rather than consider exemptions. However, DEQ also recognizes that the authority and level of effort necessary to prevent water pollution varies greatly from one DMA to the next. As such, DEQ may elect to exempt specific entities from implementation plan requirements.
* Exemptions may be made:
* As part of the TMDL, development process and specified in the TMDL WQMP; or After the TMDL is adopted, and if DEQ believes, there is sufficient reason to justify an exemption.
* Note, however, that an exemption from the plan requirement does not negate the responsibility of the DMA to prevent their activities from violating water quality standards.

### Implementation Plan Elements (Division 42)

The TMDL Implementation Plan should include all elements identified in OAR Division 42 (<http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_042.html>)

* DEQ TMDL Implementation Plan Guidance – for State and Local Government Designated Management Agencies, May 2007 (<http://www.deq.state.or.us/WQ/TMDLs/docs/impl/07wq004tmdlimplplan.pdf>)
* Draft Guidance for TMDL Implementation Plan Development for Urban/Rural Residential Land Uses within the Coastal Zone Management Area (Draft TMDL Implementation Plan Coastal Guidance) (In development), and the TMDL WQMP
1. Identify the management strategies the DMA or other responsible person will use to achieve load allocations and reduce pollutant loading;
List types of management strategies. Additional monitoring, source analysis, implementation of practices, education, etc.
The TMDL WQMP will provide the pollutant loads reduction needed by TMDL listed pollutant(s) and source(s) and the estimated pollutant load reduction by recommended most effective and other recommended BPMs in order to meet the TMDL load allocations. (Refer to the Draft TMDL Implementation Plan Coastal Guidance Appendix I and J for a complete list of urban and rural residential programmatic and structural most effective and other recommended BMPs.)
• The TMDL WQMP will list the specific pollutants that need to be addressed, potential sources of those pollutants, and the pollutant loads by TMDL listed pollutant(s). However, the list of sources may not cover all source categories that fall within the DMA’s jurisdiction therefore, it is important to assess whether other sources are likely to exist.
• The DMA must select both the type and number of BMPs to be implemented within its jurisdiction in order to equal the TMDL pollutant load.
• Programmatic BMPs usually involve the development and implementation of policies, guidance documents, and other actions and for urban and rural residential areas, the adoption of ordinances that protect sensitive environmental areas, the prevention of pollutants entering waters of the state (e.g. erosion and sediment control), or require infiltration and/or treatment of runoff.
• Many structural BMPs rely on construction of facilities or restoration activities that prevent, control, and treat pollutants. Many also involve infiltration, evaporation, and capture and/ reuse. In addition, some of the recommended structural BMPs capture and treat runoff pollutants.
• Provide for performance monitoring with a plan for periodic review and revision of the implementation plan. Performance Monitoring means monitoring implementation of management strategies, including sector-specific and source-specific implementation plans, and resulting water quality changes. Therefore, performance monitoring needs to include tracking of implementation as well as monitoring of water quality indicators.
• Provide in the TMDL Implementation Plan a description of the DMA’s proposed information/education activities needed for implementing the plan.
• For DMAs that are not covered under a MS4 permit, the following general stormwater control measure categories – as described in the MS4 Phase I Permit conditions - should be addressed in Implementation Plans with adjustments to the number and timing of these controls based on the size of the DMA and potential for growth, for example:
1. Public Education and Outreach on Stormwater Impacts.
2. Public Involvement/Participation.
3. Illicit Discharge Detection and Elimination.
4. Construction Site Stormwater Runoff Control.
5. Post-construction Stormwater Management in New Development and Redevelopment.
6. Pollution Prevention in Municipal Operations.
• Given the influence of impervious surfaces from residential, commercial and industrial development on water quality, post-construction stormwater standards must be established to meet load allocations. These standards will also help DMAs avoid the installation of costly retrofits to meet load allocations. The following approach captures 5 key elements for controlling post-construction stormwater and these elements should be incorporated in the DMA’s stormwater requirements:
1. A trigger for complying with post-construction stormwater standards (as a minimum and/or for consistency with the NPDES Phase I and II permits, new development and redevelopment that disturbs one acre or more, or less than one acre if part of a larger common plan of development or sale is an example of a minimum trigger).
2. A site performance standard for new development and redevelopment that requires site-specific management practices that target natural surface or predevelopment hydrologic function as much as practicable and optimizes on-site retention based on the site conditions (this standard reflects Oregon MS4 Phase 1 Permit and EPA’s guidance on MS4 Permits which is being used as reference for the revision of stormwater management plans used in the MS4 Phase II Permit).
3. A treatment standard that requires the capture and treatment of 80% of the annual runoff volume based on a documented local or regional rainfall frequency and intensity (consistent with MS4 Permits).
4. Sizing criteria relevant to local soils that identifies a design storm. OSU Extension and others have developed tools to evaluate the effect of stormwater controls on runoff volume and/or to evaluate different development scenarios. These include:
o OSU Extension Service Stormwater Management & Decision Support Process (SWMP) http://extension.oregonstate.edu/watershed/stormwater-assessment-and-management
o Site Evaluation Tool (SET) http://www.unrba.org/set/index.shtml
o Delaware Urban Runoff Management Model (DURMM) http://www.swc.dnrec.delaware.gov/Pages/SedimentStormwater.aspx
5. Specifications for designing structural stormwater controls to provide the level of treatment specified. For example, DMA’s can refer to and adapt existing stormwater design manuals such as the City of Portland’s Stormwater Manual and Clean Water Service’s Low Impact Development Approach Handbook.
• To help reduce the cost of stormwater management for a developer and the volume of stormwater generated by a development, the DMA should require that a developer first consider nonstructural stormwater controls such as better site design before considering structural stormwater controls. To implement this “nonstructural stormwater controls first” approach, the DMA may need to identify barriers to better site design and other nonstructural controls in their existing land use development standards. The Center for Watershed Protection has developed the following worksheet to evaluate how a community’s code addresses 22 better site design principles:
http://www.scdhec.gov/environment/baq/docs/ModelOrdinances/CodesandOrdinancesWorksheet.pdf
2. Provide a timeline for implementing management strategies and a schedule for completing measurable milestones;
Describe how a DMA would develop timelines for implementing strategies.
Develop interim, measurable milestones for determining whether management measures are being implemented and develop a schedule for implementing the Plan.
• Measurable goals are generally defined as BMP design objectives or goals that quantify the progress of program implementation and the performance of selected BMPs. They are objective markers or milestones that DMAs will use to track the progress and effectiveness of selected BMPs in reducing pollutants to meet TMDL load allocations.
• The TMDL Implementation Plan schedule should include timelines for implementing management strategies. This should include both programmatic and structural BMPs implementation timelines, including all the TMDL Implementation Plan elements identified in OAR Division 42 and the TMDL WQMP. (Refer to Section H of the Draft TMDL Implementation Plan Coastal Guidance for example schedule with measurable goals.)
3. Provide for performance monitoring with a plan for periodic review and revision of the implementation plan;
Describe DEQ’s expectations for DMAs to track implementation and make revisions based on the findings.
Annual and five year reports or reporting within the timeline identified in the TMDL WQMP should be submitted to DEQ. The reports are recommended to include a description of DMA’s intention to review its implementation plan. In addition, the report should reference the plan’s schedule (see Section B above) and describe the progress of implementing the DMA’s management strategies.
4. To the extent required by ORS 197.180 and OAR chapter 340, division 18, provide evidence of compliance with applicable statewide land use requirements; and
Explain what the requirements are
To provide evidence that a TMDL Implementation Plan complies with local land use requirements, in most cases, the plan should:
• Identify applicable acknowledged local comprehensive plan provisions and land use regulations, and explain how the implementation plan is consistent with these local planning requirements or what steps will be taken to make the local planning requirements consistent with the implementation plan.
• The DMA’s planning director will need to send a letter to DEQ, certifying that their Comprehensive Plan and implementing ordinances comply or will comply by a given timeline with the applicable management measures identified in their TMDL Implementation Plan and their compliance with applicable statewide land use compliance.
5. Provide a list of additional information for implementation plans that should be specified in WQMP.Provide any other analyses or information specified in the WQMP.
If DEQ identifies any additional requirements for DMAs in the TMDL WQMP, these requirements must be addressed in the DMA’s TMDL Implementation Plan. Oregon’s TMDL rule (OAR Division 42) states: “Provide any other analyses or information specified in the WQMP. Moreover, “For sources subject to permit requirements in ORS 468B.050, wasteload allocations, and other management strategies will be incorporated into permit requirements.”

### Negotiating the level of detail in implementation plans based on DMA’s capacity

DEQ expects many of the water pollution problems being addressed through TMDLs will take several years or decades to be resolved. In addition, DEQ knows that some DMAs, particularly smaller entities, have limited resources, authority, and the political support to develop and implement a comprehensive TMDL Implementation Plan.

Potential pollutant load should be considered when setting expectations for DMAs to develop implementation plans. Depending on the capacity of the DMA, technical assistance needed may not lead to significant load reduction.

* DEQ prefers to work with smaller DMAs to develop a customized TMDL Implementation Plan suited to the magnitude of their contribution to the problem.
* It may also be necessary for DMAs to prioritize among the strategies, if resources are limited by addressing some sources of pollution before others or focusing implementation efforts in a particular geographic area.
* To the extent possible, the selection of priorities should be driven by the greatest opportunities for achieving pollutant reductions.
* As such, DEQ may elect to exempt specific entities from implementation plan requirements.
* TMDL WQMP should recommend for each DMA a sequencing of the stormwater 6 minimum control measures to address depending on parameters of greatest concern and achievement of early results for water quality improvement. For example, if a community is expected to grow rapidly, post-construction stormwater management may be first of 6 measures to implement. On the other hand, if bacteria related to drinking water, shell fish harvesting, or crossover between sewage and stormwater pipes is the primary concern, then illicit discharge may be identified as earliest in sequencing. If education and outreach is selected as the first effort, it should indicate up front the specific audience the DMA intends to target and parameter they will address. The purpose of this is to guide/require DMAs to work on early action items that are most meaningful and effective for meeting load allocations.
* Given their limited capacity, small DMAs (e.g., population less than 5,000) should not be expected to implement the construction site stormwater control minimum control measure as described in the first cycle of the NPDES MS4 Phase II Permit. Alternatively, these small DMAs should be expected to require that developers provide proof of NPDES 1200-C Permit Coverage for development and redevelopment that disturbs one acre or more, or less than one acre if part of a larger common plan of development or sale and identify a process to inform DEQ of erosion and sedimentation problems on construction sites in their jurisdiction. .
* All basin coordinators should put their approved implementation plans on a sharepoint site (to be set up by HQ NPS Koto?) and fill in the “Approval Checklist Matrix” developed by ??—Pamela and WR could take a first shot at it if you want). The purpose is for DEQ to track the criteria for approval of implementation plans for consistency across basins and regions so that we are requiring similar rigor from DMA implementation plans.

### Implementation Plan approval process

Describe a recommended timeline and process for implementation plan review and approval.

The due date for the TMDL Implementation Plans is described in the WQMP section of each TMDL.

* Typically, the due date for submitting completed plans is 18 months following DEQ’s issuance of a TMDL.
* DEQ is required to notify DMAs, affected parties, and others by letter of the plan due date within 20 days after the TMDL is issued as an EQC Order.

After DEQ receives the plan, DEQ will acknowledge receipt of the plan by letter and will strive to review it within 60 days.

* If the plan cannot be reviewed within 60 days, DEQ will let the DMA know when the review will be undertaken.
* The plan will be reviewed to ensure that it includes all required components and adequately addresses known or suspected sources of pollution under the DMA’s jurisdiction.
* If the plan is found to be unsatisfactory, DEQ will identify which portions of the plan are considered inadequate, return the plan and identify a timeframe for resubmitting the plan. (To the extent possible, DEQ will provide resource materials and technical assistance to those needing help to complete the plan.)
* After receiving a satisfactory plan, DEQ will send the DMA a letter of approval.
* The approval letter may also include recommendations for additional actions the DMA should consider or undertake or DEQ’s expectations of things to be addressed in a future update of the plan.

## Guidelines for evaluating the adequacy of AgWQMAP and Rules

ODA employs Agricultural Water Quality Management Area Plans (AgWQMAP)and associated rules to implement TMDLs throughout the state. Periodic review of the progress ofAgWQMAP implementation is in rule (OAR 603-090-0020) and the Area Plans are reviewed every two years.

Local Management Agencies (LMA) are funded to conduct outreach and education, develop individual farm plans for operations in the planning area, work with landowners to implement management practices, and help landowners secure funding to cost-share water quality improvement practices. Progress reports, which are submitted to the Board of Agriculture after the biennial review process, are developed based on data collected by Local Management Agencies and ODA on progress of implementation of the plans and rules. Reports to the Board of Agriculture and Director will include statistics on numbers of farm plans developed and types of management practices being employed. These reports are available to DEQ for review in assessing implementation progress.

Some of the local advisory committees and local management agencies are beginning to track rule compliance and monitor effectiveness of implementation efforts. DEQ expects ODA to have programs and plans to meet TMDL Load allocations.

### Biennial Reviews and Interim Check-ins

Due to state statutes applicable to agriculture, ODA does not submit implementation plans to DEQ and instead revise and implement AgWQM Area Plans in response to applicable TMDLs. DEQ reviews and provides comments to AgWQM Area Plan and Rule during biennial review in order to ensure that Area Plans and Rules, when implemented, will result in attaining WQS and TMDL LAs.DEQ should also participate, as invited, with subcommittees or executive committees of Local Advisory Committees that meet more frequently than biennially to monitor progress, review data, and modify strategies. DEQ does not have authority to approve area plans and rules, but is encouraged to comment on them. Further, if there are issues related to the adequacy of area plans and rules to meet TMDL load

allocations, DEQ will ask EQC to petition ODA to review area plans and rules.

When working with ODA during biennial reviews, take the following steps:

* Request that ODA water quality specialist provide biennial report to DEQ with sufficient time to review before biennial LAC review meeting.
* Request that the biennial report contain the following:

Referenced load allocation for each TMDL pollutant

Management strategies implemented within each 6th field HUC (with agricultural land use)

What TMDL pollutants each management strategy addresses

Status of attaining mission/goals/objectives in Area Plan

1. Effectiveness monitoring (i.e., impact evaluation) results, if any, from modeling of implemented management practices
	1. Total pollutant load reduced (within each 6th field HUC) from management strategies implemented (if modeling data is available)
2. Milestones (i.e., process indicators) met, with an explanation for those not met
* List of accomplishments should provide a statement of work specific for each SWCD.
* The responsibility for tracking the accomplishments by SWCDs should be borne by ODA, and tracking should be by water shed or sub-watershed so it can be linked to water quality data to ensure AgWQMPs are meeting load allocations
* ODA should consider using NRCS’s practice based tool to evaluate the load reduction (Reference to this model??? This is in their “secret practices book” ).
* The AgWQMAP should include a plan element for a progress report on the implementation of the area plan and this progress report should be available for DEQ to evaluate during the biennial review.
	+ The framework for the reporting progress should be organized in a matrix showing the following elements: TMDL load allocation, Area Plan Rules (characteristics to achieve), AgWQMAP goals/objectives, strategies/management practices, timeline for strategy/management practice implementation, process indicator (see 6.4.3 below), and a brief summary of results during the last two years.
	+ The report should also include an evaluation of the Area Plan’s impact (see 6.4.3) when management practices are implemented.
* The implementation of the area plan as summarized in the progress report coupled with a summary of the process indicators achieved and a summary of the impact evaluation provides assurance that ODA is working to attain WQS and TMDL LAs.

### Work agreements between ODA and LMA

ODA negotiates scope of work with SWCDs to improve impaired water quality and support implementation of TMDLs. BCs provide technical assistance to SWCDs, as invited.

* Scopes of work should include geographic or some other way to prioritize outreach and projects
* Scopes should explain the basis for priorities (e.g. air photos, water quality model, landowner/community support, source identification, federal matching funds)
* Tasks in scope should implement strategies that achieve a pollutant reduction or desired land characteristics from Area Plan rules.
* Should include annual timeline with relevant grant deadlines
* Should include monitoring design, maps of monitoring sites, and QA (or reference a separate QA Plan) for measuring the impact of the Area Plan implementation.
* Work agreements should target a specific geographical area and channel a significant percentage of the available resources to this area in an effort to more clearly demonstrate the impact of ODA’s effort (see discussion on process indicators and impact evaluation in 6.4.3).
	+ The target area should be determined using available monitoring data, suggestions from watershed councils, and any other studies, aerial photography etc. that identify potential sources of TMDL pollutant loading.
	+ The targeting of a specific geographical area should create opportunities for modeling and for monitoring studies to calibrate pollutant load reductions estimated using modeling (see 6.4/3), and this should provide ODA with information to include in their impact evaluation of their efforts to meet load allocations.
* ODA’s scope of work should identify what TMDL load allocations, Area Plan rules (i.e., characteristics to achieve), goals and objectives that will be implemented by the strategies/management practices proposed in the work agreement.
* Work agreements should include tasks for collecting data for the indicators of progress and, if appropriate, tasks for conducting an impact evaluation (see 6.4.3) identified in the AgWQMAP monitoring program and needed for ODA’s progress report.

### Minimum requirements for AgWQMAP and Rules for implementing TMDLs

Insert TMDL Development flowchart in appendix. Describe how DEQ determines adequacy of Area Plans and Rules.

* Update TMDL information, as necessary
* If TMDL WQMP lists particular strategies that will meet load allocations, indicate which of those strategies will be implemented in the next 2-year cycle.
* List/map characteristics of subwatersheds (6th field): crop types, soil characteristics, drainage density, etc.
* Acknowledge load allocations/surrogate measures for agricultural land
* Include as a table or text
	+ List agricultural practices that are sources of each TMDL pollutant
	+ Area rule that will reduce pollution from each source
	+ Identify target reductions from each source to meet load allocation.
	+ List reduction strategies and which TMDL pollutants they pertain to
	+ Timeline for implementing each strategy
	+ Describe methods for monitoring progress and effectiveness, and quantifying load reductions
	+ Identify interim benchmarks or milestones - details may be in scopes of work.
* Identify all SWCDs involved as LMAs ( if Ag Area covers more than one county)
* Specify what ODA wants to achieve and how they will measure their accomplishments against their goals.
* Reporting - describe format of biennial report and intended audience
* This is necessary for adaptive management. Describe two-year outreach strategy - more detail may be in scope of work.
* Reporting and evaluation—ODA water quality staff should inform local Basin Coordinators and DEQ Headquarters staff when Biennial Reviews have been completed and provide a copy of or website link to the Review.

DEQ review criteria considerations:

Do the Area Plan’s goals, objectives, strategies, and management practices refine the TMDL WQMP’s recommended management strategies?

Is the proposed management practice capable of meeting the LA and is it a currently accepted/recommended agricultural management practice?

Does the management of manure and heavy use areas avoid triggering UIC requirements or comply with UIC prohibitions?

Does the management practice conflict with other proposed practices?

Does the process indicator correspond well with the strategy/management practice?

|  |  |
| --- | --- |
| Division 340-042-0080 (3) | Division 603-090-030 |
| Strategies | Description of geographic area coveredList water quality issues of concernList of current beneficial uses impairedGoal to prevent water pollution/erosion to achieve WQ standardsPollution prevention/control measures deemed necessary |
| Timeline | Schedule for implementation of necessary measures |
| Performance monitoring and review | * Strategy for ensuring measures are implemented
* Rules must be sufficient to prevent and control water pollution
 |
| Compliance with land use requirements |  |
| Analyses or information specified in WQMP |  |

* Area plans should clearly identify in a table how the Area Plan Rules will address the TMDL load allocations and the recommended TMDL WQMP management strategies for Agriculture using the following format:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| TMDL LA | Area Rules(Characteristics to Achieve) | Recommended TMDL WQMP management strategies for Agriculture | Plan Goals | Plan Objectives | LAC Strategies | Management Practices (if applicable) | Timeline |

* + ODA should draw from the activities listed in the TMDL’s Water Quality Management Plan (WQMP) that are provided by DEQ to meet the load allocations (e.g., Willamette TMDL, Chapter 14, Appendix 14.B).
		- Note: for this recommendation to be effective, our WQMPs need to be clearer as to what management strategies meet the load allocation. For example, in the Willamette TMDL, we recommend the following management strategies “protect and restore buffers, riparian and wetland areas” and “incorporate grazing management measures into AgWQMAP.” To address these recommended activities, ODA developed a So. Willamette Valley Area Plan that recommended a BMP for rotational grazing in riparian areas which is counterproductive for complying with the load allocation for temperature and bacteria. In this example, DEQ’s recommended management strategy to “protect riparian areas etc.” needs to further identify the agricultural operations that need to be excluded to protect these areas.
	+ There should be a close correlation between the Area Plan’s goal, objectives, strategies for Plan implementation, and proposed management practices.
* The AgWQMAP should have a monitoring program that includes the identification of process indicators (i.e., how ODA and its partners are implementing the Area Plan) for each strategy/management practice and that includes a description of how ODA will conduct its impact evaluation (i.e., how effective is the implementation of the Area Plan’s management practices in meeting the load allocations) using modeling (see examples below) and/or the results of BMP effectiveness studies. .
	+ Examples of Process Indicators:
		- Number of trainings provided and number of trainees attending.
		- Number of compliance visits.
		- Miles of riparian fencing installed.
	+ Examples of Impact Evaluation:
		- Area of agricultural land controlled by a riparian buffer or vegetated filter strips and the estimated pollutant load reduction achieve by this control using The Vegetated Filter Strip Model:
		- <http://abe.ufl.edu/carpena/vfsmod/>
		- Quantify the impact of implemented agricultural management practices in a watershed on sediment using the SWAT Model:
		- <http://kieser-associates.com/uploaded/pawpaw_swat_modeling_report_final_v4.pdf>
		- <http://swatmodel.tamu.edu/software/swat-model>
	+ Studies of BMP effectiveness for various controls such as manure management to obtain estimates of pollutant reductions achieved by these controls and to calibrate the models used in ODA’s impact evaluation.
* Determination of Area Plan adequacy using the following review criteria:
	+ Do the Area Plan’s goals, objectives, strategies, and management practices refine the TMDL WQMP’s recommended management strategies?
	+ Is the proposed management practice capable of meeting the LA and is it a currently accepted/recommended agricultural management practice?
	+ Does the management of manure and heavy use areas avoid triggering UIC requirements or comply with UIC prohibitions?
	+ Does the management practice conflict with other proposed practices?
	+ Does the process indicator correspond well with the strategy/management practice?
	+ Does the evaluation of the Area Plan’s impact estimate/assess the load reduction achieved by the implementation of management practices?

### Sources for BMP effectiveness

List the models and other tools available to estimate load reduction. Describe general lack of information around BMP effectiveness. Explain the need to compare WQ and modeling in order to adjust milestones and BMPs in order to meet instream WQ goals.

* STEPL
* ArcSWAT
* Vegetated Filter Strip Model

### Process for Conflict resolution (4.3.2)

The process will be negotiated through development of MOA with ODA.

## Guidelines for evaluating the adequacy of FPA Rules

### FPA Reviews during TMDL development

Purpose of the evaluation is to determine if current or proposed rules are adequate to meet the load allocations or water quality standards.

The evaluation must consider the following factors

* Determine evaluation, study design, and data collection needs (may include modeling or statistical approach). Evaluation and study Study design should be coordinated with ODF and stakeholders.
	+ Temperature evaluation methods: Heat Source modeling; Control-Impact or Before-After/Control-Impact studies by ODF or DEQ (e.g. RipStream); Cooperative Monitoring, Evaluation, and Research Committee (CMER) studies in Washington state; meta-analysis of prior studies and studies published in the literature.
	+ Turbidity/Bedded Sediment evaluation methods: Control-Impact or Before-After/Control-Impact studies by ODF or DEQ; modeling (GRAIP or WARSEM for roads, HSPF for logging and yarding); analysis of existing data (e.g Public Water System turbidity data); meta-analysis of prior studies and studies published in the literature.Pesticide evaluation methods: Forestry-specific runoff, drift, and groundwater transport studies; forest sector-specific literature review or meta-analysis of existing studies; modeling of drift and/or runoff using models appropriate for and calibrated with forest sector data and site conditions; carriers and ‘inert’ ingredients (e.g. diesel and alkyl-phenols) should also be evaluated.
* Analysis must result in pollutant loading at the harvest scale and cumulatively or watershed wide.
* Pollutant loads must be quantified based on:
	+ existing conditions; and
	+ the conditions that exist or would existing under the exact FPA measures backed by regulatory authority.
* Evaluation should be informed by and make use of literature from studies in Oregon or other relevant states and/or provinces. In some cases, a review of published and state agency literature may be sufficient to evaluate BMP efficacy.

### Minimum requirements to implement TMDLs

FPA is the minimum required but if evaluation indicates more is needed, DEQ will communicate that to ODF. Monitoring will be needed to track implementation and evaluate program effectiveness.

* A passing evaluation FPA rules must meet water quality standards temporally and spatially.
* List/map 6th field characteristics. Determine if any have unusual characteristics that require special practices to meet LAs.
* Active restoration needs should be identified and prioritized. The basis for those priorities should be explained and restoration activities should have timelines. Funding sources should be identified.
* ODF and DEQ should cooperatively agree on a monitoring plan for rule compliance, restoration implementation, and water quality.

### Sources for BMP effectiveness

Published literature, state and federal agencies in the United States and Canada, modeling with appropriate methodologies.

### Process for Conflict resolution (4.3.2)

The process will be negotiated through development of MOA with ODF.

## Tracking practices and actions to meet load allocations

When planning TMDL implementation, the following considerations should be made and documented for internal and external communications. Once documented, these decisions are considered DEQ’s commitment for TMDL implementations. When changes need to be made due to budget or shift in agency priorities, communicate such changes to DMAs and partners with revised expectations for them.

* DEQ’s resources available to interact with DMAs (schedule, staff involvement, appropriate activities, etc.)
* Appropriate monitoring mechanisms specific to the water quality goals and implementation strategies applicable to the basin in question
* Tools to identify appropriate action areas and levels of priority
* Tools to identify the level of implementation required and timescale
* DEQ role in specific project identification and prioritization
* DEQ collection of data from implementation (either from DEQ monitoring efforts or from data submitted by DMAs)
* DEQ mechanisms for storing/compiling data
* DEQ’s role in assessing data and interpreting water quality trends
* DEQ’s role in relaying their findings to DMAs and other appropriate stakeholders
* DEQ’s role in determining future actions
* DEQ’s role and responsibility in enforcement actions where implementation is not proceeding as needed or is not achieving the desired outcomes

### Models to identify priority areas and quantity of practices needed (also see 4.5 and 4.6)

* HSPF or other watershed models
* Bayesian network models or other statistical methods
* GIS based processes

List and describe models that are available to support implementation tracking and evaluation of program effectiveness.

### Assistance to DMAs and source sectors to quantify management strategies needed to meet load allocations.

* Technical resources to design practices
* Project management support for overseeing implementation
* Development of proposals for various funding sources

### Assistance to DMAs and source sectors to develop specific timelines and milestones based on quantified management measures and TMDL timelines and milestones

DMAs’ implementation plans need to include timelines and milestones that contribute to timelines and milestones in WQMP. Provide examples of milestones that are measurable. If further source analysis is needed to identify priority areas, for example, timelines should be included in the implementation plan for completing that task.

* Essential for adaptive management
* Quantify progress (or lack of)
* Set both water quality and practice implementation mile stones
* Establish end point of implementation to ensure continued work
* Identify what is or is not working with respect to water quality improvements and program management
* Provide stakeholders with information about what to expect
* Assign responsibilities

## Monitoring and Adaptive Management

DEQ expects many of the water pollution problems being addressed through TMDLs will take several years or decades to be resolved.

Where implementation of the TMDL Implementation Plan or effectiveness of management techniques is found to be inadequate; DEQ expects management agencies to revise the components of the implementation plan to address these deficiencies.

Through adaptive management, DEQ expects that the adequacy of these activities will be monitored and modified over time as needed.

Pollution reduction plans, whether for a broad area or specific site, tend to have an opportunistic component. That is, for reasons of practicality and efficiency, implementation plans adapt to the realities on the ground, such as the willingness of particular property owners to participate, the availability of particular funding, or physical constraints.

The greater the investment in advance planning, the greater the certainty of the final result.

For complex situations, an adaptive management approach for implementation planning is often practical and helps to set reasonable expectations. This implies that post-implementation evaluation may need to be an explicit component of executing the implementation plan, and most likely be incorporated into the funding of the plan. This can often be done through various milestones for measuring progress and for preventing future load increases, funding for post-evaluation, and implementation refinements. It is almost certain that follow-up steps will be needed to achieve full implementation.

When DEQ, in consultation with the DMAs, concludes that all feasible steps have been taken to meet the TMDL and attainment of water quality standards, the TMDL, or the associated surrogates is not practicable, it will reopen the TMDL and revise it as appropriate.

DEQ would also consider re-opening the TMDL should new information become available indicating that the TMDL or its associated surrogates should be modified. Figure 6 (Coastal Guidance and DEQ 2007 TMDL IP Guidance) provides a graphic description of the adaptive management process.

### Determining monitoring responsibilities for DMAs

DMAs need to track implementation actions to measure against their milestones and timelines. If DMAs are required to monitor through permits or have ongoing monitoring programs, encourage them to leverage those efforts to obtain monitoring information for TMDL implementation.

### Seeking opportunity for coordinated monitoring for evaluating TMDL implementation effectiveness

DMAs are encouraged to coordinate their monitoring efforts. If possible, an umbrella monitoring plan for TMDL implementation that covers all participating DMAs should be developed.

### Leveraging existing monitoring efforts to meet TMDL needs

There are existing monitoring efforts in a basin or watershed. Watershed councils, soil and water conservation districts, and schools are potential partners in obtaining monitoring data.

### Engaging local partners in adaptive management

DEQ recognizes that the relationship between management actions and pollutant load reductions is often not precisely quantifiable. An *adaptive management* approach is encouraged, including interim objectives and feedback through monitoring. Adaptive management can be defined as a *systematic* *process for continually improving management policies and practices by learning from the outcomes of* *operational programs.*

In conducting its review DEQ will evaluate progress towards achieving the TMDL (and water quality standards) and the success of implementing the WQMP.

TMDL Advisory Committee, including DMAs and invited local partners, share their knowledge of local WQ conditions, land use, and funding opportunities.

* General elements of stakeholder involvement in adaptive management:
* Establish monitoring goals (date and level to be met)
* Establish implementation milestones (date and level to be met)
* Identify potential alternatives to initial management measures
* Set realistic expectations given limited resources among parties (including DEQ).

Encourage each designated organization to monitor and document its progress in carrying out the provisions of its Implementation Plan. This information should be provided to DEQ for its use in reviewing the TMDL.

As implementation of the WQMP and the associated Implementation Plans proceeds, DEQ expects that planners will develop benchmarks for attainment of TMDL surrogates that can then be used to measure progress.

Where performance of the Implementation Plans or effectiveness of management techniques is found to be inadequate, DEQ expects designated participants to revise their plan components to address the deficiencies.

Consult DMAs and other parties, when evaluating whether all feasible steps have been taken to meet the TMDL, its associated surrogates and water quality standards. If the TMDL or the associated surrogates and standards are not practicable, the TMDL may be reopened and revised as appropriate.