# 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
3. Lack of clear policy to include air source analyses
4. Lack of timelines and measurable milestones
5. 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

# Introduction

# Background Information

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

## TMDL Program in Oregon

This subsection provides overview of the 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.

## Regulatory Authority

This subsection includes laws and regulations that provide authority to DEQ to develop TMDLs.

DEQ is authorized under federal CWA and 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) DEQ has the specific authority to take the actions necessary to attain and maintain water quality standards and to implement load allocations extablished under a TMDL.

OAR340-042 Total Maximum Daily Load To achieve and maintain water quality standards, 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.

OAR340-012-0055(2) Class II Violations (e)Failing to timely submit or implement a Total Maximum Daily Load (TMDL) Implementation Plan, by a Designated Management Agency (DMA), as required by department order.

Authorities related to Nonpoint (Non-NPDES) Source Pollution Prevention and Control: The document 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.

* NPS authorities document
* CWA
* ORS
* OAR

Provide regulatory authority for implementation: DMAs and permit holders (flow charts)

## TMDL Policy

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.

## Prioritizing and scheduling TMDL development

Describe the process for prioritizing and scheduling TMDL development

Discussed by regional WQ managers and HQ TMDL program manager annually.

Decisions based on funding/resources, WQ impairment, available data, etc.

## Scope of the IMD

Scope: 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). This IMD is focused on how to develop certain elements of WQMPs and to guide local implementation efforts. DEQ has heard from staff and DMAs that guidance in those areas is needed. 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 (Doug and Tonya)

DEQ is beginning to use the Watershed Approach in order to prioritize environmental issues and coordinate efforts within a specific geographic area. This section provides background information and describes each step of watershed planning.

## How TMDLs fit within watershed planning processes

Describe each step of watershed planning process, and where in those steps TMDLs are addressed (see attached process diagram)

## Identifying areas in need of Basin Scale TMDLs

List considerations and process to determine where basin scale TMDLs are needed (extent of impairment, pollutant, potential sources, land use, etc)

## Identifying areas in need of Implementation Ready TMDLs

List considerations and process to determine where implementation ready TMDLs are needed (extent of impairment, pollutant, potential sources, land use, etc)

## Identifying data gaps

List considerations and process to identify data gaps

## Measuring progress

List possible measures for documenting progress, and describe their advantages

Reference DEQ Watershed Planning IMD and EPA guidance for Developing Watershed Plans

# TMDL Development (Kevin and Ryan unless noted otherwise)

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

Description of what is covered in this chapter.

## TMDL Elements (Division 42 )

Briefly describe what we do and under what authority. List EPA guidance documents for each of the TMDL Elements. If needed (and there is time), describe what we do differently from EPA guidance.

### Name and location

### Pollutant identification

### Water quality criteria and beneficial uses

### Loading capacity

### Excess load

### Sources or source categories – explain the need for better NPS characterization of load and geographic sources

### Allocations

#### Wasteload allocation

#### Load allocations

Include the use of surrogate measures

### Margin of safety

### Seasonal variation

### Reserve capacity

### Water quality management plan (WQMP)

#### Condition assessment and problem description

#### Goals and objectives

#### Proposed management strategies designed to meet the wasteload allocations and load allocations in the TMDL

#### Timeline for implementing management strategies

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

#### Timeline for attainment of water quality standards

#### Identification of persons, including DMAs responsible for implementing the management strategies and developing and revising implementation plans

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

#### Schedule for preparation and submission of sector specific or source specific implementation plans

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

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

#### Plan for public involvement

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

#### General discussion of costs and funding for implementing management strategies

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

## Establishing and working with a local advisory group (David, Kevin, Ryan)

Provide purpose of having a local 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.

* LAC are primary method for building partnerships in the watershed
* Identify interested parties for each sector (ag, municipal, forest, ...) in watershed
* Review plans with LAC members to get feedback and make alterations when necessary

### Role of the advisory group

Describe the role of the advisory group, that it is an advisory group and not a decision making body.

Explain that they will provide input for

* Sources
* Local conditions
* Priority areas
* Types of implementation measures
* Quantify load reductions
* Identify available resources for implementation

### Guidelines for selecting group membership

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 issues 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

Describe membership and scope of each subcommittees. Should other committees be added to this list?

* 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 Analysis

Describe the purpose and process of conducting source analysis. Provide tools such as models that could be used for the analysis. Reference available references such as EPA guidance document Watershed Planning Handbook.

* OAR 340-042-0030 defines “Source” as “any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody”
* Purpose: Identify and quantify any process, practice, activity or resulting condition that causes or may cause pollution of a waterbodySource analysis is an analysis of sources and their cause and effect relationship to the pollution impairment.
* Source analysis 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

### Data (Doug, Ryan, and Kevin)

Describe the process to review and collect data for source analysis. Reference EPA guidance documents such as Watershed Planning Handbook.

#### Evaluation of existing data

#### Identify data gaps and additional data needs

#### Collecting additional data

#### Roles of local partners and DMAs

For TMDL Implementation tracking and program effectiveness monitoring, see 5.2.11 and 6.8

### Identification of pollutant sources

* + - 1. Develop a working conceptual model/s identifying all potential sources 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 (Beth and Benjamin?)

Potential 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 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 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 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

For city and county DMAs, their TMDL Implementation Plan will address sources of nonpoint pollution from urban developments, including all rural developments and rural residential areas. Specifically, for urban and rural residential areas within the Coastal Zone Management Area, the TMDL Implementation Plan is recommended to identify BMPs for a comprehensive stormwater (water quality and quantity) management program to reduce and treat stormwater discharges and associated pollutants. The BMPs are recommended to include construction site erosion and sediment control, post-construction stormwater management for new development and redevelopment, stormwater retrofitting, and implementation strategies for areas within their ownership. For example, in the case of temperature TMDLs, cities and counties may need to assess riparian conditions within their ownerships and plan strategies to protect, restore, and enhance riparian areas. (Ref.: **Draft** **Guidance for TMDL Implementation Plan Development for Urban/Rural Residential Land Uses Within The Coastal Zone Management Area, DEQ, April 211)**

Ask Don/ review Urban TMDL Implementation guidance document.

### Nonpoint sources

If further 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)

### Air and Land sources

Coordinate with AQ and LQ to develop this section. (use info from issue paper)

### Flow/ Water Quantity (Don B)

Instream flow could be used as a load allocation surrogate with “where feasible” caveat. DEQ’s current policy for flow protection is to not identify WRD as a DMA, but rather rely on voluntary efforts and Integrated Water Resources Strategy. Need to state that our loading capacity analysis and allocations use a flow level for calculation and that we could use the flow targets. In addition for calculating NTP, we use a flow level that should be there. Also describe the use of State Instream Water Rights for protecting the flows used in the TMDL in addition to IWRS and voluntary or market based approaches.

* TMDLs do not address flow directly as a load allocation. This is because TMDLs target pollutants. However, flow is one component of loading and substantially influences pollutant concentration. Regarding temperature, in many settings the water quality standard can only be attained when flows are at near-natural levels, particularly during the warm season when flows are commonly depleted by human-based withdrawals. In order to address flow in the TMDL context, TMDL documents generally include flow discussion and/or requirements. For instance, Oregon temperature TMDLs typically include simulation of increased flow levels in rivers that are artificially depleted. This informs as to the influence of flow on temperature, and provides a quantitative estimate of the natural condition criteria. In order to address flow in TMDL allocations, narrative surrogates have been included in some Oregon TMDLs. Examples include:
	+ Umatilla Subbasin TMDL, 2001, Section 2.1.1.6., Surrogate Measure #5: *Where feasible and attainable, instream flows should be maintained or increased during the critical season (at a minimum, June to September) by limiting water withdrawals, improved flow management, and/or flow augmentation*.
	+ John Day Basin TMDL, 2010, Section 2.1.8.7.: Load Allocation Surrogate – Instream Flow. This load allocation surrogate is defined as *where feasible, instream flows should be protected to target natural discharge levels during April through September*.
* As quantitative targets for thermal moderation, DEQ bases TMDL load allocations on solar radiant heat per unit stream surface area – such an allocation is not flow dependant. As stated previously, the resultant temperatures are flow dependant, and are simulated for a range of flows, including a natural flow estimate. However, TMDL flow targets for allocations are generally not quantified – except that the NTP temperature profile, based on estimated natural vegetation, channel form and flow; provides for point source temperature limits and long term evaluation of water quality standard attainment.
* The water quality standard's natural condition criterion refers to 'natural thermal potential' (NTP). The natural thermal potential is defined as “the determination of the thermal profile of a water body using best available methods of analysis and the best available information on the site potential riparian vegetation, stream geomorphology, stream flows and other measures to reflect natural conditions” (OAR 340-041-0002(35)). The stream flow component of this definition is distinct from the others, in that flow effects are not readily described in terms of target pollutants. In addition, the CWA specifically states: “…nothing in this Act shall be construed to supersede or abrogate water rights to quantities of water which have been established by any state…” (Section 101(g)). Accordingly, flow restoration efforts in Oregon and elsewhere are normally balanced with economic feasibility. (Examples from Freshwater Trust, willing buyers, sellers, lease participants)
* Methods of flow restoration and protection include:
	+ the acquisition of instream water rights
	+ voluntary efforts carried out by citizens, Watershed Councils, SWCDs and water advocacy NGO's
	+ OWRD Allocation of Conserved Water Program
	+ market based approaches
* Discuss that WRD is not considered a DMA
* Consider referencing or incorporating the John Day TMDL response to public comment regarding flow:
"In the public comment period, we received several comments addressing flow. Questions and concerns were expressed regarding (1) whether flow requirements should be allocated, (2) whether WRD should be designated to respond to the TMDL, (3) whether flow targets should be quantified, enforceable or voluntary, (4) whether the State should commit to obtaining instream water rights; and related issues. Because these topics are inter-related, an integrated explanation is included in the following paragraphs (asterisks where modified in response to public comment).
The TMDL analysis demonstrates that natural thermal conditions are needed to meet the stream temperature standard, throughout the John Day Basin. This includes natural conditions with regard to vegetation, channel form and flow.
In developing this temperature TMDL, DEQ estimated natural potential temperature profiles for major rivers, focusing on summer afternoons. This is an outcome of the natural conditions provision of the temperature standard. Locally based temperature targets are established, that vary along a stream corridor, for the warmest part of the day. To address this, the TMDL allocations are prepared as heat limits targeting natural temperatures. The heat load maxima are based on reduced solar heating associated with natural potential vegetation and channel form. Natural flows are accounted for as well, though not through heat loads.
Pollutant (heat) reduction alone will not lead to attainment of temperature objectives in Basin streams with flow depletion. In order to address both heat inputs and flow, DEQ applies a dual approach for the TMDL: (1) set TMDL solar heating allocations (vegetation and channel form) and call for their implementation, and (2) \*establish a non-quantitative load allocation surrogate to address flow. This surrogate is defined as: *Where feasible, instream flows should be protected to* *target natural discharge levels during April through September (****Section* 2.1.8.7** in revised document).
DEQ's current process to promote flow protection and restoration relies on voluntary measures and community initiative. This approach is planned to include instream water right acquisition through DEQ (OAR 340-056) and mechanisms that will be determined through the Integrated Water Resources Strategy (http://www.oregon.gov/OWRD/LAW/ Integrated Water Supply Strategy.shtml) and discussions with basin communities and other agencies. In the past, DEQ has applied for in-stream water rights in some basins, as has the Oregon Department of Fish and Wildlife.
The TMDL allocations do not state or assume that a DMA (DMA- a legal authority for sectors contributing pollutants to waterbodies) must cease withdrawing water in order to meet this TMDL and the water quality standard. How a sector makes its operations consistent with the allocation is to be established later through the planning process provided through sector-specific TMDL Implementation Plans, developed following TMDL issuance (**Chapter 3**).
In general, water diversions are regulated by the Oregon Water Resources Department. We do not name the OWRD as a DMA. DEQ and OWRD are cooperating to develop strategies to address the influence of water quantity on water quality, through the Integrated Water Resou rces Strategy noted above."
* In summary, DEQ encourages voluntary efforts, can allocate flow as a non-quantitative TMDL surrogate and participates in various incentive-based programs designed to increase instream flow. DEQ pursues the acquisition of instream water rights, and participates in the implementation of the Integrated Water Resources Strategy. DEQ also quantitatively analyses the effects of flow on water quality; thus informing restoration strategies and priorities and providing flow information needed for point source effluent limits.

## Loading Capacity

Describe DEQ process and reference EPA guidance

OAR 340-042-0040(4)(d) states “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.” 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?

## Assign Load Allocations

### Involving local partners in LA assignment

Reference EPA guidance and briefly describe DEQ process

OAR 340-042-0040(4)(h) states that load allocations are “determines the portions of the receiving water's loading capacity that are allocated to existing nonpoint sources of pollution or to background sources”.

Involve stakeholders in the process of assigning load allocations

## Assign Waste Load Allocations

Reference EPA guidance and briefly describe DEQ process

OAR 340-042-0040(4)(g) states “This element determines 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).”

As stated in 340-042-0040(6) the department may consider the following factors when distributing wasteload allocations

* Contribution from sources – This may include a distribution framework where the load reductions are either equal among all sources or the percent load reductions are equal among all sources.
* Costs of implementing measures – This framework may include distribution of load based on minimizing implementation costs, either in sum or equalizing costs among sectors.
* Ease of implementation
* Timelines for attainment of water quality standards – this framework relies on distribution loads based on meeting water quality standards the quickest
* Environmental impacts of allocations – this framework relies on distribution of loads based on the magnitude of beneficial use impairment or improvement.
* Unintended consequences
* Any other relevant factor

## Set Margin of Safety

Reference EPA guidance and briefly describe DEQ process

OAR 340-042-0040(4)(i) states “This element 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.”

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. The 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

Reference EPA guidance and briefly describe DEQ process

OAR 340-042-0040(4)(j) states “This element 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.” 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

 Reference EPA guidance and briefly describe DEQ process

OAR 340-042-0040(4)(k) states “This element 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.”

## Reasonable Assurance

See 5.4 for content. Move this to TMDL in order to obtain EPA approval

# WQMP (Koto unless noted otherwise)

Provide a process and guidance on how to develop Water Quality Management Plans (WQMPs) with agencies and local partners. Subsections that address shortcomings of the current WQMPs will provide detailed guidance.

## Overview

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.

## WQMP Elements (Division 42)

The following are WQMP elements that are included in TMDL rule.

### 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

* The overarching goal of the WQMP is to implement the TMDLs to meet the WQS and restore impaired uses.
* List objectives that are applicable to the TMDL and measurable.

### Proposed management strategies

* See 5.6 and 5.7

### Timeline for implementing management strategies

* See 5.5

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

Permit holders will implement permits that are revised every 5 years, and DMAs will develop and implement their plans. Those efforts taken together will result in meeting WQS.

### 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 TMDLs

Provide a list of potential DMAs by pollutant

### Identification of sector-specific or source-specific implementation plans Depending on the level of analysis, DEQ may assign load allocations to a sector or individual landowner.

Advisory Committee should provide input for the scale of analysis needed for assigning LA.

### Schedule for preparation and submission of sector-specific or source-specific implementation plans

implementation plans are generally due 18 months after TMDLs are issued.

### Description of reasonable assurance

Refer to section 5.4

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

1. Identification of persons responsible for monitoring, and
2. Plan and schedule for reviewing monitoring information and revising the TMDL

Refer to section below

### Plan for public involvement in implementing management strategies

Describe ways that public will be involved.

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

Describe ongoing efforts such as periodic review of TMDLs and AgWQM Area Plans and Rules.

### General discussion of costs and funding for implementing management strategies

Describe how to determine costs for restoration and list potential funding sources

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

## Identification of DMAs and local partners (See 5.2.7 – delete?)

### Table of DMAs for each pollutant (minimum requirement)

## Reasonable Assurance (Koto and Gene)

“Reasonable assurance”must be provided by the states that the TMDL will be implemented. Reasonable assurance could be provided through a variety of ways through voluntary and regulatory programs. Oregon’s section 319 Management Plan (approved by EPA in 2000) explains that there are a variety of programs in Oregon that provide financial incentives, technical assistance, and educational programs. In addition, Oregon’s attorney general’s office has provided a memo describing ODA and ODF’s regulatory authorities, as well as DEQ’s backup authorities for nonpoint source pollution management. .

### DEQ’s regulatory authority

Reference nonpoint source, CNPCP backup authorities, and other related memos. Reference enforcement guidance and include a description.

The Enforcement Guidance says we should send the DMA or source a “Warning Letter with Opportunity to Correct” if they haven't timely submitted or implemented an Implementation Plan.

### Process for interagency conflict resolution

Conflicts related to TMDL development and implementation should be resolved at staff level if possible. (borrow from forest conversion MOA)

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

Explain that ongoing implementation efforts as well as additional local or area specific regulatory enforcement tools to implement TMDLs could be used to provide reasonable assurance.

Reference EPA guidance for Developing Watershed Plans

## Setting Timelines and Milestones (Kevin and Koto)

Include specific timelines and associated milestones in all TMDLs by working with stakeholders and DMAs. The Enforcement Guidance says we should send the DMA or source a Warning Letter with Opportunity to correct if they haven't timely implemented an Implementation Plan.

Provide guidance on how to set specific timelines for implementation and water quality milestones

* Timelines should be developed for meeting interim goals, benchmarks, and meeting load allocation. Goals and benchmarks need to be measurable.
* Timeline will be determined with input from DMAs and partners during TMDL development process.
* 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.
* See chapter 12 of Watershed Plans Handbook

### Considerations and process for setting timelines and milestones

Timelines and milestones will be determined with DMA and local stakeholder input. (See flowchart) Milestones will be set for both instream WQ and practices. Administrative capacity and resources should be considered.

Goal – a water quality target o achieve at a dsiganited 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.

### Monitoring and evaluation *of goals and* milestones

* Develop water quality monitoring program that can measure progress toward goals
	+ Select locations of monitoring sites
	+ Define conditions (hydrologic, seasonal, land management, …) when samples will be collected
	+ Determine minimum sample size needed to assess if goal is met
	+ Identify technical needs for collection and analysis of sampls
	+ Assign responsibility to parties for collecting, astorage, and transfer of samples for analysis
	+ Determine who is responsible for analysis of sample results
	+ Select data analysis methods to be used to assess if goal is met
* Develop 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
	+ Assign responsibility to parties responsible analysis of monitoring results
	+ Develop protocol for adaptive management

### Considerations and process for setting permit schedule

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

Reference EPA guidance for Developing Watershed Plans

* Assess technical needs
* Identify potential funding opportunities for local partners
* Evaluate the feasibility of local partners ability to meet project milestones

## Pollutant reduction for Nonpoint Sources (Ryan and Tonya?)

* 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
* Quantify BMPs into acres, units, and/or design specification that are needed to meet Load Allocations. BMPs should be quantified by DMA and watershed,
* Develop strategies for implementation to meet Load allocatons
* Indentify priority areas for implementation of BMPs – consideration should be given to pollution reduction per unit of investment, (bank for the buck), local priorities or plans, local capacity and willingness for implementation, or other key considerations

## Pollutant reduction for Point Sources (Beth and Sonja?)

### Permit renewal

### Trading

### Air sources

## Pollutant reduction through other programs (Sheree, Alex, Karen Wisler, Karen Tarnow? – or, should this be a placeholder to be developed at a later date?)

### Source Water Protection

### §401 Water Quality Certifications

### Pretreatment

### Air and land quality programs

### Integrated Water Resource Strategies

## Funding (should this be a placeholder to be developed at a later date?)

### List of resources

### DEQ funding 319 and SRF

### Engage funding agencies and entities in TMDL process

## Monitoring and Adaptive Management (Doug and Kevin)

### Identify persons responsible for monitoring

Describe what steps should be taken to ensure persons responsible for monitoring.

#### DEQ resources

#### Designated Management Agencies

#### Permittees

#### Utilizing local advisory group

### Track implementation and monitoring WQ

Explain how to obtain information needed to evaluate progress toward attainment of TMDL WLA and LA.

#### Indentify lead agencies/ local partners

#### Revise existing or developing an overall monitoring plan to measure effectiveness of TMDL implementation

#### Define role of DEQ in local monitoring efforts

### Review monitoring information and Revise the TMDL.

# TMDL Implementation (Koto unless noted otherwise)

Set guidelines for evaluating and approving implementation plans in this section.

## Overview

### Types of DMAs

Summarize the responsibilities of DMAs and DEQ’s expectations.

DEQ expects DMAs to have programs and plans to meet TMDL Load allocations.

* State and federal agencies such as ODA, ODF, COE, USFS with shared responsibilities for WQ.
* DEQ for point sources, including NPDES urban stormwater and except CAFO.
* Other state and federal agencies that are land managers such as ODFW, DLCD, Parks, BLM, USFWS, etc.
* Cities, municipalities (including non-NPDES stormwater)\_
* Special districts such as irrigation and drainage districts

### Partners other than DMAs

Watershed Councils, NRCS, OSU extension, SWCDs – partner to plan, monitor, outreach, and prioritize implementation

NRCS, FSA, BPA, etc. other funding sources and sources for technical and financial assistance.

## Regulatory programs for implementing TMDLs (Koto, Beth, Don Yon, Steve R?)

Describe each program and what coordination needs to happen in order to implement TMDLs.

### NPDES Permits: Involve permittees in technical advisory committee, incorporate WLA as effluent limits

### Local ordinances and codes: As part of TMDL implementation effort, DMAs (municipalities, cities) may develop ordinances and codes

### FPA: Encourage stewardship foresters to engage in technical adivisory committee, review and consider revising FPA rules to meet LA

### AgWQMAP: Encourage SWCD and ODA WQ specialists to engage in technical advisory committee, review and consider AgWQM Area Plans and Rules to meet LA

### Pesticide Labels: Depending on the pollutant, ODA Pesticide program may be involved in addition to NRD to strategize pollutant reduction to meet LA

### §401 WQ Certifications: Where there are approved TMDLs, take TMDLs into consideration when issuing WQ certifications.

### DSL rules: Encourage DSL to engage in technical advisory committee. Take TMDLs into consideration when permits are issued.

### WQ Restoration Plans, Federal land leases, and plan of operations: Encourage federal agencies to engage in technical advisory committee, and consider TMDLs in planning, land management activities and when permits are issued.

### TMDL Implementation Plans: See section for TMDL Implementation Plan review – 6.3

### Other programs that support goals of TMDLs

### Forest Plans

### Resource Management Plans

### Oregon Plan

### ODFW Conservation Strategies

### ODOT

### Integrated Water Resource Strategy

## Evaluating the adequacy of Implementation Plans (Don Yon, Pamela and Doug)

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

### Implementation Plan Elements (Division 42)

The TMDL Implementation Plan should include all elements identified in OAR Division 42 (both the WQMP and Implementation Plan sections) (http://arcweb.sos.state.or.us/rules/OARs\_300/OAR\_340/340\_042.html), the 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), the 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.
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.”

### 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.

### Minimum requirements for implementation plans

List information that need to be included in implementation plans, and

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

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 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.

* 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.

### 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 (Karen, Chris, and Koto)

### 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.

* Requset 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 objectives in Area Plan

Effectiveness monitoring results, if any

Milestones met, explanation for those not met

Total pollutant load reduced (within each 6th field HUC) from management strategies implemented (if modeling data is available)

### 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 progress and effectiveness.

### 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.
* 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 road 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)
* Reporting - describe format of biennial report and intended audience
* Describe two-year outreach strategy - more detail may be in scope of work.

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 |  |

### 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

Examples of Process Indicators:

* Number of trainings provided and number of trainees attending
* Number of compliance visits
* Miles of riparian fencing installed

Example of Impact Evaluation

* Area of agricultural land controlled by a riparian buffer or vegetated filter strips and the estimated pollutant load reduction achieved 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.

### 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 (Ryan, David, and Josh)

### FPA Reviews during TMDL development

Describe how DEQ would evaluate the adequacy of FPA rules for each pollutant (through use of models, studies, etc.)

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 study design and data collection needs (may include modeling or statistical approach). Study design should be coordinated with ODF and stakeholders
* 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.

### 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

### Sources for BMP effectiveness

Reference relevant information

### Process for Conflict resolution (4.3.2)

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

## Tools and Process for tracking practices and actions identified in WQMPs to meet load allocations (Kevin and Ryan)

### 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 (Kevin and Doug)

### 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.

### Including local partners in TMDL monitoring

Watershed councils and schools are potential partners in obtaining monitoring data.

### Engaging local partners in adaptive management

In addition to DMAs, invite local partners to engage in TMDL Advisory Committee to share their knowledge of local WQ conditions, land use, and funding opportunities.

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.

 DEQ expects that each designated organization will also 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.

 When DEQ in consultation with the DMAs and other parties, concludes that all feasible steps have been taken to meet the TMDL, its associated surrogates and water quality standards, and that the TMDL or the associated surrogates and standards are not practicable, the TMDL may be reopened and revised as appropriate.

*  DEQ will consider reopening the TMDL should new information become available indicating that the TMDL or its associated surrogates need revision.

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).