State of Idaho

Guidance for Development of Total Maximum Daily Loads

June 8, 1999

Water Quality Programs / Surface Water Section
Idaho Division of Environmental Quality

IDAHO TMDL Development Guidance

Table of Contents

IDAHO TMDL Development Guidance

A Brief TMDL Background

The Clean Water Act and Section 303(d)

Section 303(d)(1) of the Clean Water Act requires states to prepare a list of waters not meeting state water quality standards in spite of technology based pollution control efforts. This list must include a priority ranking "... taking into account severity of the pollution and the uses to be made of such waters." The prescribed remedy for these water quality limited waters is for states to determine the total maximum daily load (TMDL) for pollutants "... at a level necessary to implement applicable water quality standards with seasonal variations and a margin of safety ..." A margin of safety is included to account for any lack of knowledge about how limiting pollutant loads will attain water quality.

Section 303(d)(2) requires both the list and any total maximum daily loads developed by the state be submitted to the Environmental Protection Agency (EPA). The EPA is given thirty days to either approve or disapprove the state's submission. If the EPA disapproves, the agency has another thirty days to develop a list or TMDL for the state. Both the list and all TMDLs, either approved or developed by EPA, are incorporated into the state's continuing planning process as called for in section 303(e).

This language has been in the Clean Water Act since it was passed in 1972. It is the cornerstone of the approach of using instream standards to protect water quality, and provides an essential complement to technology-based controls, including required best management practices used for non-point source pollution control. Technology-based control sets minimum levels of waste treatment applied to all dischargers irrespective of receiving water quality. These controls are incorporated in discharge permits, focused on discernable point sources, and have been very successful in improving this nation's water quality in many areas.

However, with increasing population density and intensive land use, technology based control is not always enough. This is where water quality standards and TMDLs come in. By an analysis of pollutant loads and how they affect receiving water quality, an additional degree of pollution control is determined which goes beyond the practical or achievable minimums set by technology. In this way TMDLs are the backup to technology-based controls, they are waterbody, rather than source, dependent.

What is a TMDL Really?

A TMDL is a pollutant budget. This budget is most simply expressed in terms of loads, the quantities or mass of pollutants added to a waterbody. Pollutant loads can be calculated as the product of concentration and flow much like earnings can be calculated from hourly pay rate and number of hours worked. According to EPA regulations and guidance, this budget takes into account loads from point and non-point sources, and human-caused as well as natural background loads. The budget is

balanced at the point where water quality standards are just being met and is allocated among all the various sources. Like keeping money in the bank for a rainy day, some of the budget is set aside as the margin of safety. And like a business's cash flow concerns, the pollution budget must take into account the seasonality or cyclic nature of pollutant loads and receiving water capacity, so that a temporary shortfall does not occur.

In cases where numeric criteria for water quality criteria have been established, the balance point is fairly clear, but dependent on stream flow. However, fixed value criteria do not always make sense. Some pollutants are natural constituents of water and become a problem only when present in abnormal amounts, abnormality being very much tied to and confounded by natural environmental variations. Sediment and nutrients are two such complex pollutants, and narrative criteria are used in Idaho to address these. A narrative criterion simply says the water should not contain a pollutant in amounts that will impair the water's beneficial uses.

Idaho has moved to direct assessment of aquatic biology to determine if certain beneficial uses are impaired. Though powerful, biological assessment does not provide a numeric water column value with which to establish a water's pollutant load capacity. This requires a case by case evaluation to establish a site specific numeric target, greatly complicating TMDL development unless 'other appropriate measures' are used in place of a traditional load.

Some 303(d) History

Under section 303(d)(1), EPA was required to identify pollutants suitable for TMDL calculation, which they finally did in late 1978. Many of the issues regarding scope and applicability of TMDLs heard today were also voiced in 1978, but far fewer people were taking notice then. The EPA itself downplayed the role and importance of TMDLs, instead focusing on point source discharge permits and attending to oversight of waste water treatment construction grants.

The first Water Quality Planning and Management rules implementing 303(d), were adopted 11 January 1985 in 40 CFR, Part 130. At that time EPA still saw a limited role for TMDLs, stating in the Federal Register that "EPA believes it best serves the purposes of the [Clean Water] Act to require States to establish TMDLs and submit them to EPA for approval only where such TMDLs are needed to 'bridge the gap' between existing effluent limitations, other pollution controls, and WQS [Water Quality Standards]". In these rules EPA defines load, loading capacity, load allocations, and wasteload allocations and the requirements for a 303(d) list.

In April 1991, EPA published its first guidance document on TMDLs: *Guidance for Water Quality-based Decisions: The TMDL Process.* That document is still current and speaks to both the listing process and TMDL development. It is here that EPA first formalizes the ideas of phased TMDLs,

pollution source trade-offs, reasonable assurance, negotiating a schedule for pace of development, listing of threatened good quality waters, and biennial submission of lists starting in 1992. Biennial submission of lists was subsequently codified in July 1992 amendments to 40 CFR Part 130 as a step to merge reporting requirements under 305(b) and 303(d). It was specified that 1992 lists were due 22 October 1992. These amendments also require specific identification of TMDLs to be completed in the two years before the next list.

A compilation of EPA regulations, guidance, and policy memos was assembled and published in February 1997 as *Total Maximum Daily Load (TMDL) Program: Policy and Guidance Volume 1*. This three-inch ring binder includes the SF Salmon River TMDL in Idaho as one of thirteen case studies.

Recognizing a need to revise its regulations in the face of rising questions about the scope and requirements of TMDLs, EPA's Administrator requested a subgroup of the National Advisory Council for Environmental Policy be convened to provide advice. With 20 members representing state government, private industry, and environmental activists, the TMDL Federal Advisory Committee received its charge in November of 1996 and delivered a report of its recommendations 28 July 1998.

The EPA is currently drafting revised regulations based upon the FACA report which it hopes to promulgate by spring of 2000. Draft regulations are expected to be proposed and available for public review in the summer of 1999. These new rules will change the requirements for TMDL content and process. One likely major change is a FACA recommendation that implementation plans become an integral part of a TMDL submitted to EPA for approval.

<u>The Idaho Experience (The Lawsuit)</u>

In June 1989 Idaho submitted its first 303(d) list (as Appendix D of 1988 Water Quality Status Report and Nonpoint Source Assessment) with 31 waters. No pollutants or priority were stated and EPA neither approved or disapproved this list.

Idaho submitted its second list in August of 1992, as a separate list, ahead of schedule, but again specifying no pollutants or priorities. This list of 31 waters (8 additions and 8 deletions from 1989) received no response from EPA within the allotted 30 days. Not until 12 February 1993 did EPA issue a letter of "conditional approval" of the 1992 list, asking Idaho to evaluate certain EPA proposed additions of segments and pollutants. The letter also asked Idaho to solicit and respond to public comment, giving the state 90 days to reply. Idaho did not respond by 12 May, and EPA extended its deadline to 19 July 1993.

Tired of the lack of action, the Idaho Sporting Congress and Idaho Conservation League filed a 60 day notice of intent to sue EPA on 14 May 1993. Idaho submitted a revised 1992 list with 36 waters,

including pollutants and priorities (22 high, 4 medium, & 10 low) by the extended deadline, just five days after the plaintiffs filed their complaint.

The environmentalist's complaint faulted EPA for approval of a 303(d) list which did not include all water quality limited (WQL) waters in Idaho. They asked the court to order EPA to disapprove the 1992 list and all Idaho TMDL submissions (of which there was only one at the time, the SF Salmon River). As a further remedy, the plaintiffs sought court directive for EPA to identify WQLs, develop and implement TMDLs for Idaho, and to prohibit permitting of point source discharges until TMDLs were in place. Before the case was heard, EPA approved Idaho's 1992 list in a letter dated 18 August 1993.

As the case was being considered, Idaho developed a 1994 303(d) list of 61 waterbodies and submitted it to EPA on 9 February 1994. On 15 March 1994, EPA responded by asking the state to consider adding 200 waters and specific pollutants to the list. The state responded 8 April, with a 1994 list of 62 waters, 45 of which were high priority, 8 medium, and 9 low. This list also identified 31 TMDLs underway or targeted for initiation in the next two years.

On 13 April 1994, in a partial summary judgement, the court found EPA approval of Idaho's 1992 list "arbitrary and capricious" and remanded the issue to EPA with direction to develop a new list within 30 days. The EPA published notice of a draft list of 788 waters on 13 May and in the ensuing months went through a protracted public process to develop a comprehensive list for Idaho. Public comment was voluminous, causing EPA to extend the comment deadline once and take until 7 October to review all input and produce a final list with 962 303(d) waters. Despite this new list the lawsuit was not dismissed.

The EPA list became acknowledged to contain many errors (stream names, duplication, overlap, etc.) and streams not necessarily water quality impaired. In developing their 1994 list, EPA scoured several Idaho and federal agency reports. These consisted primarily of Idaho's 1992 303(b) report, 1991 Basin Status Reports and their Stream Segments of Concern (SSOCs), 1993 Lake Water Quality Assessment Report and several Forest Plans. Some streams ended up on the list, not for failure to meet Idaho Water Quality Standards, but rather for failure to meet other criteria such as Forest Service standards and guidelines. Others were added simply because of great public interest regardless of water quality, or because of good water quality the public wanted maintained, or because of perceived threats to water quality, all expressed as SSOC's. Much of the information used was qualitative rather than quantitative.

The 1995 Idaho legislature responded by passing SB 1284, codified in IDAPA 39-3601 *et seq.* Among other things, this new water quality law established Basin Advisory Groups (BAGs) and allowed for Watershed Advisory Groups (WAGs) to assist DEQ in prioritizing and implementing TMDLs. The legislature also responded by funding DEQ's biological assessment program known as BURP (Beneficial Use Reconnaissance Program). Not until 1996 did the legislature fund additional positions for DEQ to meet its obligations under the new law.

IDAHO TMDL Development Guidance

Upon review of a plaintiff motion, the court on 19 May 1995 ruled against EPA for its failure "to determine, with Idaho, a reasonable schedule for the development of TMDLs for all waterbodies designated as WQLSs." Judge Dwyer ordered a schedule to be filed with the court within one year. Working with EPA, Idaho delivered a schedule on 15 May 1996, which set short term due dates (by year) for 42 high priority waters, and a long term commitment to develop 2 TMDLs per year in each of Idaho's six administrative basins. Taking Idaho's assumptions regarding de-listing of many streams, EPA estimated it would take 25 years, or until 2021, to work through the 1994 list. While the court considered this "25 year" schedule, Idaho submitted a 1996 303(d) list with only minor changes. Later, in April 1997, DEQ submitted some technical corrections to the list, eliminating some duplications. This trimmed the list slightly to 950 waters.

Dwyer rejected the "25 year" schedule on 26 September 1996 criticizing it for a lack of firm dates for all waters and finding no assurance that all necessary TMDLs would be developed even in 25 years "... unless hundreds of WQLS were to fall off the list." He agreed with the plaintiffs that massive adjustments to the list were unlikely. Figuring it would take Idaho a hundred years to complete all TMDLs at two per year per basin, he described the pace as glacial and ordered EPA to work with Idaho to provide a schedule for all 303(d) waters within six months. He further suggested that an overall time frame of five years was appropriate for the schedule, a time frame stated in a Georgia decision just days earlier.

The DEQ worked closely with EPA and negotiated with the plaintiffs to develop an eight-year schedule, as well as an administrative record to support it. This schedule was built around a subbasin by subbasin approach to grouping waters for assessment and loading analysis. It was predicated on agreement with EPA that TMDL implementation is a separate step in the process which comes after approval of a TMDL. Under this agreement implementation is not included as part of a TMDL submitted to EPA (page 2-1 of *Idaho TMDL Development Schedule: EPA Review and Evaluation*, April 1997). Idaho's Eight-year TMDL Development Schedule was presented to Dwyer on 8 April 1997 (Attachment A), along with EPA's review and evaluation and a stipulation that the schedule was reasonable and could be carried out by Idaho. The stipulations were so ordered the following day, and the case was finally dismissed on 24 June 1997.

IDAHO TMDL Development Guidance

Introduction

The remainder of this document addresses various aspects of how DEQ and the State of Idaho intends to go about development of TMDLs. Though much discussion and review has gone into each section it is expected that our plan of attack will continue to change some with further experience and future changes in federal or state rules.

As one example of such change, this document originated as specific policy statements intended only to guide internal working arrangements. The document has evolved into guidance and broadened its audience somewhat to other agencies and interests outside DEQ.

Not all the answers you may seek about TMDLs will be answered herein, but hopefully the general framework will become clear. It is important to note that TMDLs are the focus of a lot of interest and discussion throughout this nation. Events outside Idaho have and will continue to shape what we call TMDLs and how we in Idaho deal with complex issues such as habitat and flow, narrative criteria, and estimating non-point source loads.

General Statement on Development Pace and Process

The State of Idaho intends to develop total maximum daily load (TMDL) analyses for all water quality limited waters on its' 1996 Clean Water Act §303(d) list, unless subsequently de-listed, by the end of 2005. The order and pace of TMDL development is presented in the State of Idaho eight year TMDL schedule agreed to on April 8, 1997 (Attachment A). The State of Idaho will also develop TMDLs for waterbodies determined to be water quality limited subsequent to the 1996 list. Where possible, additions to Idaho's §303(d) list will be addressed along with currently scheduled waters in the same subbasin, otherwise a separate date will be specified.

Development of TMDLs will be in accord with the provisions of the federal Clean Water Act, Idaho Code 39-3601 *et seq.*, and all other applicable laws. The Idaho Division of Environmental Quality (DEQ) is the lead agency for development of TMDLs for Idaho waters. However, the Environmental Protection Agency (EPA) will have a role in coordinating multi-jurisdictional TMDLs involving interstate or tribal waters.

Implementation of an approved TMDL is primarily the responsibility of designated agencies, as stated in Idaho Code 39-3612, in cooperation with landowners and managers. These designated agencies are defined in Idaho Code 39-3602 as the Department of Lands (IDL), for timber harvest, oil and gas exploration and development, and for mining; the Soil Conservation Commission (SCC) for grazing and agriculture; the Department of Transportation (IDT) for public roads; the Department of Agriculture (IDA) for aquaculture; and the DEQ for all other activities.

Purpose

Total maximum daily loads are watershed-based analyses of the quantities and sources of pollutants which prevent a water from meeting its beneficial uses. The aim is to restore those uses through reductions in pollutants added to the water. A watershed-based approach recognizes the effect of both point and nonpoint sources of pollution in degrading water quality. The analysis must identify the causes of beneficial use impairment and estimate pollutant loads which will meet water quality criteria and restore impaired uses within a specified time. Additional corrective actions will be needed only where application of required and other existing pollution controls are, or are expected to be, inadequate to meet Idaho's water quality standards.

Idaho's Eight-year Schedule

In Idaho's eight-year schedule, 42 high priority waterbodies are scheduled individually for completion by the end of 1999. Remaining medium and low priority waterbodies are scheduled, subbasin by subbasin, to be completed by the end of 2005. This schedule is based on calendar years and TMDLs are due to be submitted to the Environmental Protection Agency (EPA) no later than December 31 of the year scheduled.

The schedule allows that larger or more complex subbasins may be split for practical reasons. Where such splits occur, a portion may be done earlier than the date specified, but the entire subbasin will be completed by the date specified. It is also allowed that future conditions may warrant delay or advancement of a particular subbasin, therefore the schedule may be adjusted so long as the overall schedule and pace of development is met and concerned parties are consulted (see Appendix A, endnote 1).

Subbasin Approach

With a subbasin approach all waterbodies and pollutants on the current 303(d) list within a hydrologic subbasin should be addressed in a single document. Idaho has chosen this approach as a way to package adjacent waters and gain economy of scale in preparation of documents. There are 84 subbasins which are entirely or partially within Idaho (Figure 1).

The overall process may be broken down into three steps:

1) subbasin assessment,
2) loading analysis, and
3) implementation plan(s).

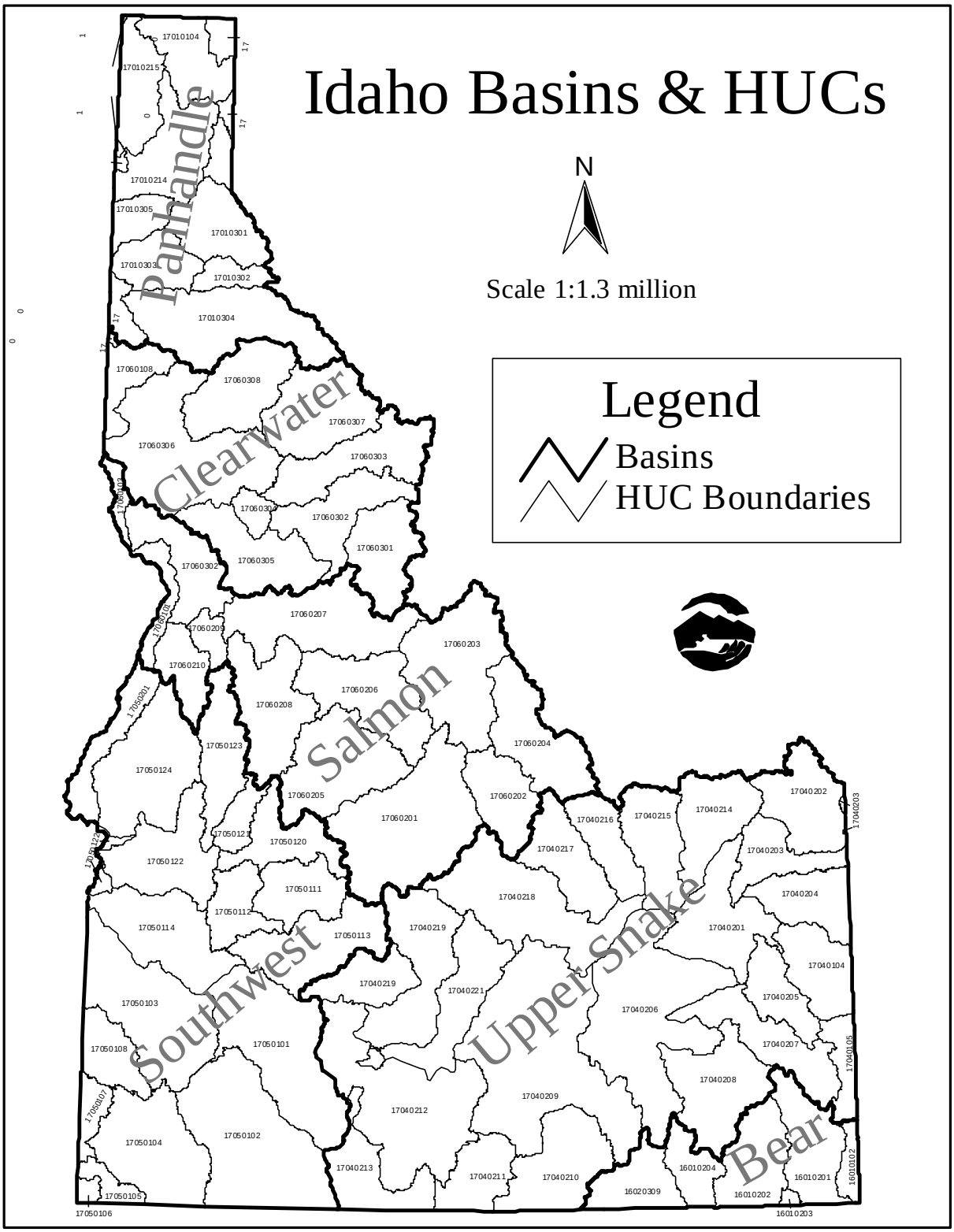


Figure 1. Idaho DEQ Administrative Basins and 4th Field Hydrologic Subbasins

These steps reflect a logical sequence of assessment, analysis and planning. The first two steps constitute the TMDL document, the product required under §303(d) to be submitted for EPA approval. The 8 April 1997 TMDL development schedule commits Idaho to deliver TMDLs in the years specified by subbasin. Implementation plans are not covered by the current schedule. This separation is made in consideration of meeting an eight-year time frame for the entire state and a distinction between §303(d) and §303(e) of the Clean Water Act.

Subbasin Assessment

Subbasin assessments are problem assessments conducted at the geographic scale of 4th field hydrologic units (cataloging units of the USGS), also referred to as subbasins. A subbasin assessment describes the affected area, the water quality concerns and status of beneficial uses of individual water bodies, nature and location of pollution sources, and a summary of past and ongoing pollution control activities. This may be a separate document or combined with the subsequent loading analyses.

Loading Analysis

Loading analysis provides an estimate of a waterbody's pollutant load capacity, a margin of safety, and allocations of load to pollutant sources defined as the TMDL in EPA regulations (40 CFR 130.2). Load capacity is the maximum quantity of a pollutant a water can receive and still meet water quality standards. This capacity is calculated for some critical or limiting condition, typically based on receiving water flow. In the classic case, maximum pollutant load must be limited so as not to exceed a statistically set minimum in load capacity based on receiving water low flow. Methods of determining load capacity will vary but generally fall into one of three categories: 1) product of an instream criterion concentration and flow; 2) modeled; or 3) reference conditions.

Once determined, the load capacity is divided up or allocated to sources. Allocations are required for each point source, categories of non-point sources, and must include a margin of safety, whose total will not exceed the load capacity. Allocations to non-point sources are termed load allocations, while point source allocations are termed wasteload allocations. Load allocations may be made by source type or land use (e.g roads, agriculture, forestry), or tributary watershed, or a combination. Each point source must have its own wasteload allocation. Minor non-point sources may receive a lumped allocation or a single 'gross allotment' may represent all non-point sources.

It is desirable to know the existing load as well. For waters not meeting criteria, the existing load must be greater than the load capacity at times. Determining the existing load provides information on how much over load there is, and allows expression of needed load reductions in terms of percent reduction from current conditions.

Analysis of pollutant loading will usually be performed at the scale of smaller watersheds (5th or 6th field hydrologic units) of listed streams within a subbasin. Generally a loading analysis is required for each pollutant of concern. But it is recognized that some listed pollutants are really responses to other pollutants. For example, habitat and dissolved oxygen (DO) are often listed as pollutants, but they are not pollutants, but rather the effect of other pollutants, e.g. sediment or decomposing organic matter. Addressing the response in a TMDL requires a loading analysis for the right causative pollutant.

This can get complicated. In the case of DO, the organic matter which decomposes to deplete oxygen may be the result of too much aquatic plant growth, in turn caused by excess nutrients. And the cause and effect can be quite far removed from one another. It is the job of the TMDL analyst to determine such links between cause and effect and properly target the cause. Thus one listed pollutant may be addressed by a loading analysis of another, requiring one TMDL not two.

Although loading analysis may take place at finer scales, and address several pollutants, it is intended that documentation of these analyses will cover a subbasin at a time.

While loading analyses is fundamentally a quantitative assessment of pollutant loads, federal regulations allow that '*loads may be expressed as mass per unit time, toxicity, or* ***other appropriate measures****'* (40 CFR 130.2(I), emphasis added). The meaning of other appropriate measures is to date, not well known. It perhaps allows flexibility in the application of TMDLs to problems that are otherwise intractable, or provides the option for use of surrogate measures to address pollutants such as sediment and temperature.

Surrogate measures can be either measures of waterbody response or pollutant sources. They are practical measures used because they are more tangible or easier to quantify than instream concentrations or actual loads. Examples include percent shade instead of the thermal load for temperature, or perhaps percent depth fines as a measure of sediment load. There must be a relation between the surrogate and the pollutant for which a traditional mass per unit time load might be calculated. Most surrogates do not lend themselves to allocation, and are thus coupled to adaptive management in which regular future monitoring feeds back into adjustment to pollutant source control. The DEQ believes use of surrogate measures can be most helpful in implementation of TMDLs for non-point sources.

In many cases, less data will be available than may be considered optimal for loading analysis. This can not delay TMDL development. In his September 26, 1996 ruling, Judge Dwyer made it clear that '*lack of precise information must not be a pretext for delay.'* (see *Idaho Sportsman's Coalition v. Browner*, Case No. C93-943WD, WD Wash.). Federal regulations also acknowledge that *'load allocations are best estimates of the loading, which*

may vary from reasonably accurate estimates ***to gross allotments'*** (40 CFR 130.2(g) emphasis added).

Gross allotments seem most appropriate to non-point sources where little information exists. Accurate and precise load estimation and the definition of the source area is far more complex for non-point sources than for point sources. The differences in control costs and water quality benefits should be weighed and may not justify the effort needed for estimates better that 'gross allotments'. The guiding principal should be 'Will a more accurate load estimate provide for better control actions, more equitable allocation of responsibility for load reduction and quicker improvement in water quality?'

Idaho's short TMDL development schedule and the regulatory allowances emphasized above point to phased TMDLs. In a phased TMDL much is yet unknown and the initial loading analysis may be very inexact with a large margin of safety to account for uncertainty. The initial phase focuses on what is known and load reductions move toward the eventual goal (by targeting more obvious source problems earlier in the implementation plan). Essential to a phased approach is inclusion of a plan to gather the data needed to refine load estimates and their allocation.

The EPA recognizes any TMDL can be revised at any time following due process, and that phased TMDLs will be the rule rather than the exception when dealing with non-point sources. The expectation is that rough load estimates will be counterbalanced by a greater commitment to future monitoring designed to better those estimates.

A complete loading analysis lays out a general pollution control strategy and an expected time frame in which water quality standards will be met. For narrative criteria, e.g. sediment and nutrient, the ultimate measure of attainment of Idaho's water quality standards is full support of beneficial uses. Idaho DEQ uses rapid bio-assessment techniques and has adopted a waterbody assessment process for determining beneficial use support taking into account biological, chemical and physical data. The DEQ will use its waterbody assessment process to ultimately determine when narrative criteria are being met. Long recovery periods (greater than ten years) are expected for TMDLs dealing with non-point sources, especially for sediment and temperature.

Implementation Plans

While it is recognized that TMDL implementation is essential to water quality improvement, it is not currently part of a TMDL submitted for EPA approval. An implementation plan is a separate document, guided by an approved TMDL, which provides details of the actions needed to achieve load reductions, a schedule of those actions, and specifies monitoring needed to document action and progress toward meeting water quality standards. The state has

committed itself to developing implementation plans within 18 months of TMDL approval. Important elements of these plans are:

- Pollutant control actions are based on the load allocations in the TMDL
- Sets a time by which water quality standards are expected to be met, including interim goals or milestones as deemed appropriate
- Schedules the what, where, and when of actions that are to take place
- Identifies who will be responsible for undertaking planned actions
- Specifies how completion of actions will be tracked
- Includes a follow-up monitoring plan to address data gaps, and how data will be evaluated and used to recommend revisions to the TMDL
- Describes monitoring to document attainment of water quality standards, including evaluation and reporting of results

Where long recovery times are expected it is recommended that interim water quality targets be established. Interim targets allow finer tunning of mid-course corrections in actions particularly relevant to non-point source controls. Surrogate measures may be employed, commonly for narrative criteria. Surrogates are a characteristic of a water, its biota, or environs related to or affected by pollutant loads, but not something which is directly discharged or could be allocated to sources. Use of surrogates often provide the link to beneficial uses and they are employed to more easily gage the progress of implementation. For example, pool volume may be a surrogate for sediment loading which more directly expresses the affect of increased sediment on fish and more visibly responds to sediment load reductions.

There may be more than one implementation plan which cover different water quality limited waterbodies within a subbasin. An implementation plan (or plans) is expected to be completed and on file at DEQ within 18 months of EPA approval of a TMDL.

Implementation plans will be cooperatively developed by DEQ, the WAG, if one exists, and 'designated agencies' (see page 6). Specific control actions will be those recommended by the WAG. These plans will be reviewed by the WAG and BAG, and subject to DEQ approval that they will lead to meeting state water quality standards. DEQ will be a repository for approved implementation plans and will incorporate them into Idaho's water quality management plan.

Workplans and Critical Milestones

Workplans will be developed which identify the principal author and a time line with dates for the following critical milestones:

- Draft Subbasin Assessment prepared by DEQ
- Subbasin Assessment presented to WAG or BAG
- Instream water quality targets determined
- Draft Loading Analysis ready for review
- Proposed load allocations presented to WAG or BAG
- Completed Draft TMDL ready for formal public comment
- Final TMDL ready for submittal to the EPA

Total maximum daily loads should be initiated by a workplan. The workplan, and any subsequent revisions will be on file with the DEQ TMDL coordinator. These workplans will be made available to the interested public, particularly BAGs, WAGs and designated agencies assisting in TMDL development. To allow sufficient time for public comment and response prior to submittal, the time line should provide for a completed draft TMDL ready for public comment by September 1st of the year of completion.

Phased TMDLs and Implementation Ramp

A phased approach is typically needed when nonpoint sources are a large part of the pollutant load, information is limited, or narrative criteria are being interpreted. Under these circumstances, common among Idaho TMDLs, there is often great uncertainty in the load capacity and a large margin of safety is used to assure meeting Idaho water quality standards. Consequently, there is great uncertainty in load allocation.

This calls for a “ramping up” of implementation in which the more obvious sources of load reduction are scheduled for action first, with increasingly difficult and less cost effective load reductions scheduled later. Essential to this strategy is gathering of information which will allow refinement of the loading analysis and will document whether restoration of beneficial uses occurs earlier than first thought.

The TMDL can be revised upon new data which indicate a revision in the loading capacity (better knowledge of relation between loading and water quality), or deviation from anticipated load reductions. These revisions may be up or down, resulting in less or more control actions needed than originally determined. In theory, great initial uncertainty and a corresponding large margin of safety results in an initial load capacity conservative on the side of assuring water quality.

Assistance of Other Agencies

The DEQ welcomes the assistance of other agencies, or private organizations, with the resources and interest in TMDL development. We recognize that many others hold information and expertise important to TMDL development and encourages those entities to work with DEQ. Furthermore, DEQ believes outside assistance will be essential to the development of sound implementation plans and practical actions needed to restore beneficial uses in impaired waters. As the lead agency in TMDL development, DEQ lists the following requirements for assistance:

- Must be willing to meet Idaho's schedule for TMDL completion.
- Efforts must be coordinated with DEQ and products are subject to review and acceptance by DEQ.
- Content must follow format set by DEQ (e.g Suggested TMDL Outline).
- The appropriate BAG and, if applicable, the WAG will be informed of such cooperative arrangements.
- Cooperators must have the expertise and resources to follow through.

In most subbasins DEQ will do the water quality assessment and look to other entities to assist in the loading analysis and especially implementation. Exceptions may occur in subbasins or smaller watersheds where land management agencies or other groups are responsible for more than 75% of the land. The Forest Service, for example, may want to develop TMDLs for watersheds they largely manage. But only DEQ can submit TMDLs for Idaho waters to EPA for approval.

Public Involvement and Comment

Idaho Code section 39-3611 states that TMDLs shall be developed in accordance with section 39-3614 (duties of the basin advisory group), section 39-3616 (duties of each watershed advisory group) and the federal Clean Water Act. Idaho Code section 39-3612 states that after a TMDL is completed the Director shall, subject to the provisions of Idaho Code section 67-5200, adopt the processes as part of the state's water quality management plan pursuant to the federal Clean Water Act. Federal regulations act also require public participation in Clean Water Act decisions (40 CFR Part 25)

BAGS are to review the development and implementation of the TMDL processes.

WAGs are to develop and recommend actions needed to effectively control sources of pollution. In doing so, the WAGs and the Director are to employ all means of public involvement deemed necessary

or required under Idaho Code section 67-5200 and shall cooperate fully with the public involvement or planning processes of other appropriate public agencies.

In meeting these various requirements, DEQ will seek public involvement as follows:

Drafts of the subbasin assessment and loading analysis will be presented to the WAG representing the geographic area covered. If no WAG exists, the applicable BAG will review these draft documents. Water quality targets and proposed load allocations will be shared with these groups prior to incorporation in a draft report. All WAG and BAG meetings are open to the public.

DEQ will publish notice in newspapers covering the TMDL geographic area advertising a thirty (30) day period for interested persons to review the draft TMDL and present comments to DEQ. If no WAG is involved in the development of the TMDL, DEQ will hold a public information meeting early in the comment period. The notice should be published with enough lead time to reasonably advise the public of the meeting. The notice should also provide where the public may obtain a copy of the draft TMDL prior to the meeting and a contact person for questions and to receive comments on the draft TMDL. At the meeting, DEQ should present information on how the TMDL was developed, how implementation will be planned and answer questions from the public, as well as take written comments.

If a WAG is involved in the development of the TMDL, a public meeting is not necessary but the thirty (30) day public comment period is still required. Public comments will be considered in preparing the final draft to be submitted to EPA.

The final TMDL document will have a section discussing public participation which will describe the WAG and BAG involved, attendance, and meeting dates. This section of the document will also have a copy of the public notice and the dates and newspapers in which it ran.

DEQ will prepare a summary of public comments received. This summary should consist of a list of those who commented, a compilation of comments into major points, and DEQ's response to each point. This responsiveness document will be part of the TMDL submittal package but not a part of the TMDL document.

Required Elements of Submittal

Idaho's DEQ must submit TMDLs developed pursuant to 303(d)(1) to the Environmental Protection Agency (EPA). They are required by law to review and consider approval of these TMDLs within 30 days of submittal. A proper TMDL submittal package consists of at least the following items:

1) A transmittal letter:

This submittal letter must state the included document is to be considered as a TMDL, which §303(d) listed waterbodies are addressed, the geographical area covered, and the responsible contact person.

2) Subbasin assessment:

A subbasin assessment can be a separate document, but will generally be combined with a loading analysis. Based on best available information, a subbasin assessment describes the affected area, the water quality concerns and status of beneficial uses of individual water bodies, nature and location of pollution sources, and a summary of past and ongoing pollution control activities.

If a subbasin assessment finds that beneficial uses are met and developing a TMDL is not needed, it should be organized to end with a summary of the status of beneficial uses. Such a document is not subject to EPA approval but will be provided to EPA to apprise them of the rationale for not developing a TMDL. Because of the import of such conclusions and to the extent interim revisions to the current 303(d) list are being made, formal public review is still necessary.

3) Loading analysis

This may or may not be a second separate document, but it builds upon the subbasin assessment and is thus generally combined with it. The loading analysis presents the rationale and selection of instream water quality targets, a determination of the loading capacity for each water quality limited waterbody, an estimate of the current loads, and an allocation of loads or load reductions among sources of a pollutant. The load capacity is the level of pollutant loading expected to meet water quality criteria and thus restore beneficial uses to full support. A loading analysis is pollutant specific, but a single loading analysis might address more than one listed pollutant.

4) Public Comments and Response

Each TMDL document will go out for formal 30 day public comment as described more fully under public involvement and comment earlier in this policy statement. The package submitted to the EPA will include a summary of public comments received and DEQ's response to those comments.

The submittal package is due to the EPA on or before December 31st of the year the TMDL is scheduled. With several TMDLs due in any given year it is desirable to stagger delivery dates. Without staggered delivery dates review times are likely to lengthen.

Specific Position Statements

Three Step Process

It is the intent of the DEQ that the TMDL process be divided into three distinct steps. These steps are 1) subbasin assessment, 2) loading analysis, and 3) implementation plan. This separation is taken for several practical reasons.

By addressing all water quality limited waterbodies on the current §303(d) list in a given subbasin at once an economy of scale in document preparation and review is sought. Furthermore, it is believed such aggregation will often reflect similarities in water quality problems, pollutant sources, and available information that will facilitate timely assessment. Making subbasin assessment the first step allows distinction of waterbodies which are truly water quality limited from those which are documented to be meeting water quality standards. To the extent possible, the subbasin assessment also identifies which pollutants are truly factors in causing impairment of beneficial uses, and the sources of those pollutants. In this way subsequent loading analysis is better defined.

A loading analysis needed only for those waterbodies and their watersheds which are documented in the subbasin assessment to be water quality limited, and only for those pollutants causing impairment. In addition to a loading capacity and allocations, a loading analysis sets out a general pollution control strategy and an expected time line for meeting water quality standards. The combination of subbasin assessment and loading analysis constitute the TMDL as required under §303(d) of the Clean Water Act.

Implementation plans are an essential third step in the process of restoring beneficial uses and assuring compliance with water quality criteria. They are not part of a TMDL submitted to EPA. These plans lay out a schedule of specific actions to be undertaken. They are to be developed within 18 months of EPA approval of a TMDL, and in accordance with the water quality goals and load allocations provided in a TMDL. Monitoring to ascertain achievement of water quality goals will be an essential part of implementation plans. Instream monitoring and assessment of water quality is the responsibility of DEQ. Monitoring the implementation and effectiveness of specific source control actions is the responsibility of designated state agencies as defined in IDAPA 16.01.02.003.23.

Dynamic Nature of Water Quality Assessments

Because of possible mistakes in Idaho's §303(d) list, ongoing availability of more current water quality data, and evolving water quality sources and controls, it is expected that subbasin assessments will differ from the §303(d) list. On one hand, listed waters may be found to support beneficial uses, or listed pollutants may be found to not be causing violation of water quality standards. In such cases a loading analysis would not be required for the water or pollutant listed in error.

On the other hand, it is also expected that waters or pollutants not currently listed may be identified in the subbasin assessment as not meeting Idaho's water quality standards. Consideration of new waters versus new pollutants presents two different situations.

Take the case of a waterbody which is on the list. If a pollutant is identified as causing water quality impairment, but that pollutant is not listed, a loading analysis will be developed for that currently unlisted pollutant.

Now consider waterbodies which are not listed. If a currently unlisted water is identified as water quality limited in the assessment, the facts will be presented but no loading analysis will be performed. Simply identifying these new waters provides notice of impairment without preempting the normal 303(d) listing process and may allow time for voluntary actions prior to the next §303(d) list.

De-listing of Waterbodies Supporting Beneficial Uses

EPA guidance allows that §303(d) lists are dynamic and that the need for changes may arise between normal listing cycles. It is the position of the DEQ that load allocations are developed only for waters or portions of waters documented to be water quality limited during the subbasin assessment step of TMDL development. But federal regulations require TMDLs be developed based on the current list.

Therefore section §303(d) listed waters, or portions thereof, which are shown to be meeting their beneficial uses must de-listed or appropriate boundary changes made on or before TMDL submittal, or non-submittal as the case may be. To handle this situation DEQ will propose such modifications to the list concurrent with public review of the TMDL, or subbasin assessment if such changes result in no TMDL. When done concurrently, it will be clearly stated in the public notice that the public comment period is for review of both the proposed TMDL or subbasin assessment and any proposed changes to the §303(d) list identified in the subbasin assessment.

Multiple Stressors

Stressors is a general term for pollutants and other factors which can affect beneficial uses. Total maximum daily loads will address all §303(d) listed stressors that are confirmed to be causative factors in water quality impairment for a particular waterbody. To the greatest extent possible, the DEQ will use its staff expertise and available information to economize by addressing multiple related stressors with allocation of one stressor. In some waters both a causative factor and its water quality effect are listed, e.g. nutrients & dissolved oxygen (DO) or sediment & habitat modification. Where the subbasin assessment demonstrates this link, the loading analysis will be developed for the cause and not the effect.

Factors Other Than Pollutants

It is Idaho DEQ's position that habitat modification and flow alteration, while they may adversely affect beneficial uses, are not suitable for development of TMDLs per §303(d) of the Clean Water Act. There are no Idaho water quality criteria for habitat or flow, nor are they suitable for estimation of load capacity or load allocations. In addition, jurisdiction over stream flow is not the purview of DEQ. Because of these practical limitations, TMDLs will not be developed to address habitat modification or flow alteration.

For many of the water quality limited waters on Idaho's §303(d) list this will have little effect. This is because concerns which resulted in a listing for habitat modification are often reflected in other listed *pollutants*—sediment or temperature, for example. In this case, actions taken to address sediment or temperature are likely to improve habitat as well. For flow alteration, other management alternatives, outside the TMDL process, will likely be needed.

Applicability of Other Water Quality Projects

Much good work has already been done or is underway in Idaho to improve water quality. This work includes many projects under the Non-point Source Program, State Agricultural Water Quality Program, Clean Lakes Program, Superfund/RCRA cleanup plans, storm water control, federal watershed analyses, Cumulative Watershed Effects analysis (CWE) and others. The DEQ intends to build on these earlier efforts, which in some cases may largely meet the requirements of a TMDL. But it is expected that the many of these other efforts will assist more in implementation of TMDLs than their development.

Coordination With Bull Trout Plans

The development of TMDLs in Idaho will be closely coordinated with the preparation of bull trout key watershed plans. Where bull trout occur, the TMDL process will incorporate the

work of bull trout recovery efforts and great care should be taken to avoid contradictions in findings or duplication of effort. However, the issues involved in bull trout conservation will often go beyond concerns about water quality addressed by a TMDL and will be addressed outside of the TMDL.

Best Available Information

In the development of TMDLs, every effort will be made to obtain all information pertinent to subbasin assessment and loading analysis within the time constraints of an eight-year schedule. At the outset of the process for a particular subbasin, a letter will go out to all known potential sources of data. This letter will request specific existing information be provided by a certain date.

Gathering of new information specific to the development of a particular TMDL will be limited by time and money. None-the-less it is desirable to devise plans and seek opportunities to address data gaps prior to and beyond TMDL submittal. Additional data gathering will be an integral part of the implementing a TMDL, and specific monitoring details will be incorporated into implementation plans.

For 1994/1996 listed waters, if sufficient data are not obtained, within the time specified, to resolve the beneficial use status of waterbodies in the "needs verification" category, such waterbodies will be included in the loading analysis as if they were not full support.

Loading estimates will be the best that the methods, time, and data available allow. It is likely that in many cases this will result in use of simple methods, such as export coefficients, and gross allotments for loads. The DEQ will not delay for the anticipated delivery of better data if doing so would jeopardize meeting the schedule for TMDL development. Such additional data would be used for future refinements of loads and implementation schedules following EPA approval of the TMDL.

Reasonable Assurance

EPA coined the phrase reasonable assurance in its April 1991 guidance document on TMDLs: *Guidance for Water Quality-based Decisions: The TMDL Process.* Reasonable assurance applies only to situations in which load reductions necessary to meet the load capacity for a particular pollutant are split among both point and non-point sources. The Clean Water Act provides for certain control, though enforcement, of point sources, but leaves non-point source control to states through largely incentive based mechanisms. Therefore EPA feels assured point source load reductions will happen, and are inclined, in mixed source situations, to require

all necessary reduction in a pollutants load come from the point sources alone, unless there are reasonable assurances that the non-point sources reduction will indeed be achieved.

While not a regulatory requirement, EPA region 10 considers lack of reasonable assurance, where applicable, to be grounds for disapproval of a TMDL. Idaho has an EPA approved Nonpoint Source Management Plan which includes certification by the attorney general that adequate authorities exist to implement the plan. Idaho's water quality rules (IDAPA 16.01.02.350) states that current best management practices will be evaluated and modified by the appropriate designated agencies if found to be inadequate to protect water quality. In addition, if necessary, injunctive or other judicial relief may be sought against the operator of a nonpoint source activity in accordance with the DEQ Director's authorities provided by Idaho Code 39-108. The DEQ believes these provide all the assurance that is reasonable and necessary for any mixed source TMDL.

Pollutant Trading

The DEQ supports and encourages pollutant trading. Pollutant trading allows for exchange in pollutant reduction responsibilities or allocations identified in the TMDL. Through trading one party pays another to further reduce their reduction of a specific pollutant in exchange for a lessening in their own reductions, in essence buying a larger piece of a water's load capacity for their waste discharge. Clear and precise rules need to be set up and agreed to by all parties to the trading, including DEQ and EPA. Once in place, these rules allow the 'free market' to operate in achieving more cost effective pollutant reductions. Trading will be particularly important in watersheds with a mix of point and non-point sources of the same pollutant.

Glossary

Allocation - a portion of the loading capacity given to a particular source. Point source allocations are termed **wasteloads**. Every point source must have a wasteload allocation. Non-point source allocations are simply called **loads**. Because of the diffuse nature of non-point sources, loads are typically allocated to particular areas, such as sub-watersheds, or types of activities, such as agriculture or forestry, or a combination.

Loading capacity - the greatest amount of pollutant loading a water can receive without violating water quality standards

Load allocation (LA) - the portion of a receiving water's loading capacity that is attributed either to one of its existing or future non-point sources of pollution or to natural background.

Margin of safety (MOS) - this is a portion of the loading capacity not allocated to pollutant sources so as to account for uncertainty in the relation of loading capacity to water quality standards. A margin of safety is used to assure water quality standards will be met even when loading capacity is not well known.

Subbasin - One of 84 pre-delineated watersheds encompassing the State of Idaho. Subbasins correspond to fourth field hydrologic units as published by the USGS.

Target - a measurable quality of water or stream condition which forms the basis for load capacity. Targets arise from water quality criteria in Idaho's Water Quality Standards and Wastewater Treatment Requirements (IDAPA 16.01.02). Where these criteria are numeric the target is merely the established numeric criterion for the pollutant of concern. When only narrative criteria exist for a pollutant, e.g. sediment or nutrients, a site specific interpretation of the criteria is required.

Total maximum daily load (TMDL) - simply the sum of the individual wasteload allocations (WLAs), load allocations (LAs), natural background, and a margin of safety (MOS); TMDL = LC = WLA + LA + MOS. In practice a TMDL includes documentation of the analysis which leads to the numbers.

Wasteload allocation (WLA) - the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.

Water quality limited - denotes a stream or other waterbody not meeting state Water Quality Standards. For purposes of Clean Water Act listing these are waters that will not meet standards even with application of required effluent limitations.

Attachment A - Idaho's Eight (8) Year TMDL Development Schedule

STATE OF IDAHO

Eight (8) Year TMDL Schedule

April 3, 1997

YEAR	DEQ Region	Subbasin Code (or Waterbody Name)
1997 (5, 38)	***Coeur d'Alene***	**SF Coeur d'Alene (14)** **Lake Coeur d'Alene (1)** **Spokane River(8)**
	Lewiston	**Paradise Creek (1)**
	Twin Falls	**Mid-Snake (14)**
1998 (6, 61)	***Boise***	**Lower Boise (11)** 17050121 (6) MF Payette
	Coeur d'Alene	*(working on subbasin assessments for subsequent TMDLs)*
	Idaho Falls	17040202 (2) Upper Henry's Fk 17060204 (14) Lemhi R
	Lewiston	Winchester Lake (1) *(working on subbasin assessments for subsequent TMDLs)*
	Pocatello	17040208 (27) Portneuf R
	Twin Falls	*(working on subbasin assessments for subsequent TMDLs)*
1999 (13, 143)	***Boise***	**Lower Payette (7)** 17050105-7 (9) Owyhee R
	Coeur d'Alene	**L. CDA River (10)** 17010214 (18) Pend Oreille L
	Idaho Falls	17040203-4 (13) Lower Henry's 17040217 (6) Little Lost R
	Lewiston	**Jim Ford Creek (1)** **Cottonwood Cr. (1)** 17060303 (26) Lochsa R
	Pocatello	17040207 (18) Blackfoot R
	Twin Falls	17040209 (3) Lake Walcott 17040212 (31) Upper Snake-Rock

YEAR	DEQ Region	Subbasin Code (or Waterbody Name)		
2000 (13, 157)	***Boise***	17050113 (18) SF Boise R	17060208 (21) SF Salmon R	17050111 (9) N&MF Boise R
	Coeur d'Alene	17010215 (10) Priest Lake	17010305 (8) Upper Spokane R	
	Idaho Falls	17040104 (5) Palisades	17060203 (7) Mid Salmon-Panther	17060207 (9) Mid Salmon -Chamberlin
	Lewiston	17060307 (19) Upper NF Clearwater	17060302 (13) Lower Selway R	
	Pocatello	16010102 (5) Central Bear	16010201 (17) Bear Lake	
	Twin Falls	17050102 (16) Bruneau R		
2001 (9, 130)	***Boise***	17050115 (1) Mid Snake-Payette	17050201 (8) Brownlee Reservoir	17050104 (10) Upper Owyhee R
	Coeur d'Alene	17010302 (14) SF Coeur d'Alene R		
	Idaho Falls	17060201 (14) Upper Salmon R	17060202 (6) Pahsimeroi R	
	Lewiston	17060305 (55) SF Clearwater R		
	Pocatello	16010202 (14) Middle Bear R		
	Twin Falls	17040219 (8) Big Wood R.		
2002 (10, 143)	***Boise***	17050103 (21) Middle Snake-Succor	17050120 (11) SF Payette	
	Coeur d'Alene	17010304 (45) St Joe R[2]		
	Idaho Falls	17040205 (21) Willow Ck	17040201 (1) Idaho Falls	
	Lewiston	17060304 (8) MF Clearwater R	17060308 (22) Lower NF Clearwater	
	Pocatello	16010204 (5) Lower Bear-Malad R		
	Twin Falls	17040210 (5) Raft R	17040211 (4) Goose Cr	

YEAR	DEQ Region	Subbasin Code (or Waterbody Name)		
2003 (9, 176)	***Boise***	17050123 (15) NF Payette	17050124 (12) Weiser R	
	Coeur d'Alene	17010301 (35) Upper Coeur d'Alene		
	Idaho Falls	17040218 (11) Big Lost R		
	Lewiston	17060108 (24) Palouse R	17060306 (58) Clearwater	
	Pocatello	17040206 (12) Am Falls Res		
	Twin Falls	17040220 (3) Camas Ck	17040221 (6) Little Wood R	
2004 (11, 83)	***Boise***	17050108 (11) Jordan Ck	17060210 (8) Little Salmon R	
	Coeur d'Alene	17010104 (9) Lower Kootenai R	17010213 (10) Lower Clark Fork	
	Idaho Falls	17040214 (4) Beaver-Camas Ck	17040215 (6) Medicine Lodge	17040216 (2) Birch Ck
	Lewiston	17060209 (23) Lower Salmon R		
	Pocatello	17040105 (1) Salt R.	16010203 (1) Little Bear-Logan	
	Twin Falls	17050101 (8) CJ Strike Reservoir		
2005 (7, 46)	***Boise***	17050112 (9) Boise-Mores Ck		
	Coeur d'Alene	17010105 (6) Moyie R	17010306 (3) Hangman Ck	
	Idaho Falls	17060205-6 (13) MF Salmon R		
	Lewiston	17060101 (5) Hells Canyon	17060103 (1) Lower Snake-Asotin	
	Pocatello	*(Will assist adjacent regions in development of TMDLs)*		
	Twin Falls	17040213 (9) Salmon Falls Cr		

EXPLANATORY NOTES

a) Named waterbody in bold denotes high priority TMDL identified in Idaho's 1996 § 303(d) list.

b) Eight digit code denotes subbasin (i.e. USGS Cataloging Unit).

c) Number in () following 8-digit subbasin code denotes # of segments in subbasin on 1996 § 303(d) list.

d) Pair of numbers below year indicates number of subbasin TMDLs scheduled for completion in that year followed by the total number of 303(d) listed segments addressed by those TMDLs.

e) Some large subbasin's (e.g. 17060306 Clearwater) may be split in two for TMDL development. These are not listed twice, but rather are listed only in the final year when the second TMDL for the subbasin is to be completed.

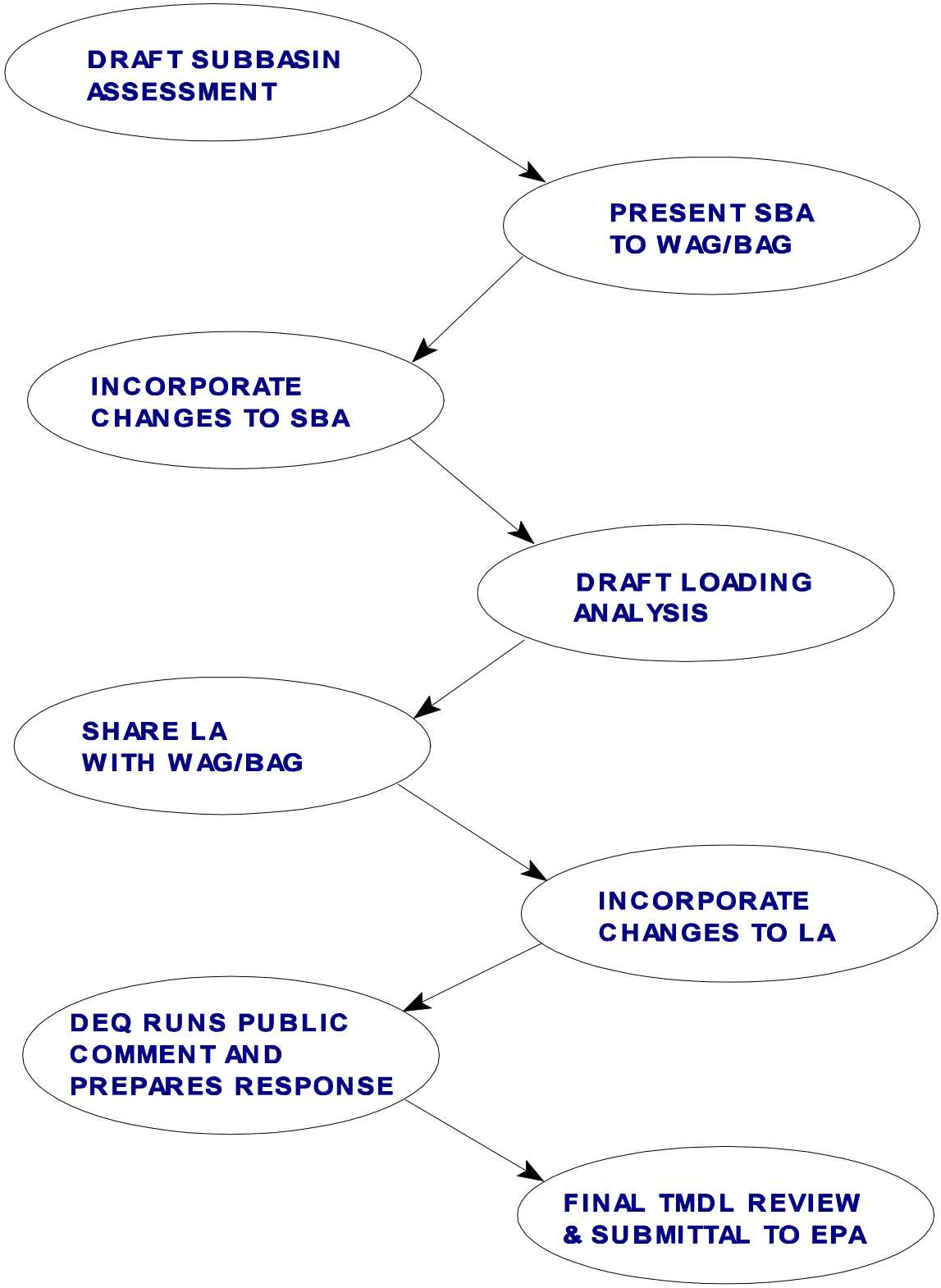
Endnotes:

1. The sequencing of TMDL development reflected in this Schedule is premised upon existing information, severity of pollution, existing resources, priorities established by Basin Advisory Groups and coordination with the activities of other state and federal agencies. The sequencing of TMDL development in Idaho's Schedule may change as additional information becomes available concerning impacts or potential impacts to beneficial uses within particular subbasins, as resources become available to complete development on TMDLs on a particular subbasin, or as priorities and activities of other state and federal agencies change.

   Any change in TMDL sequencing from this Schedule will not be made until DEQ receives recommendations from applicable Basin Advisory Groups concerning such change. Thereafter, DEQ will consult with EPA concerning such change and notify Plaintiffs, Intervenors and other interested parties concerning such change. Any change in sequencing of TMDL development will not affect the overall pace or the eight (8) year time to complete TMDLs in this Schedule.

2. The problem assessment for § 303(d) waters flowing into the St. Joe River upstream from the St. Maries River will be completed by 2000. The TMDL for the entire St. Joe River subbasin will be completed by 2002.

Attachment B - TMDL Development Process



A SUGGESTED TMDL

Outline

May 23, 1997

prepared by Don A. Essig

Water Quality Assessment and Standards Bureau
Idaho Division of Environmental Quality

Condensed TMDL Outline

1. Executive Summary

2. Subbasin Assessment

(Covers all listed pollutants, conducted at scale of 4th field HUC)

2.1 Characterization of Watershed

2.2 Water Quality Concerns & Status

2.3 Pollutant Source Inventory

2.4 Summary of Past and Present Pollution Control Efforts

3.0 TMDL - Loading Analysis and Allocation

(For each pollutant contributing to use impairment, conducted at 5th or 6th field watershed scale)

Loads may take non-traditional forms, such as miles of roads of a certain condition, and desired outcome may also take non-traditional form, such as number of active redds, residual pool volume, percent fine, et cetera. If non-traditional pollutant and water quality measures are used the relation of one to the other, and to existing water quality standards, must be clearly explained. Links between pollutants may be used but must be fully explained.

3.1 Instream Water Quality Target(s)

3.2 Load Capacity

3.3 Estimates of Existing Pollutant Loads

3.4 Load Allocation

4.0 References

2.1 Characterization of watershed

1. What are the physical and biological characteristics of the subbasin

2.2 Water Quality Concerns and Status

1. Which waterbodies in the subbasin are water quality limited?
2. What are their causes of impairment (ie. pollutants)?
3. What are their beneficial uses and relevant criteria in the Idaho standards?
4. What are the data on current and historic water quality and beneficial use status?
5. Which §303(d) listed waters are truly water quality limited and need a TMDL?
6. What are they key indicators of beneficial use impairment?
7. What gaps in data can be identified?

2.3 Pollutant Source Inventory

1. What and where are the major sources of pollutant in the subbasin?
2. Which subwatersheds likely produce the greatest loads?
3. How are different pollutants related, and how does land use or source type affect their quantity and behavior?
4. What is know about the delivery potential and variability of these sources?
5. What gaps in data can be identified?

2.4 Summary of Past and Present Pollution Control Efforts

1. What have been the pollution control efforts to date?
2. Are present and planned activities expected to achieve water quality standards in a reasonable time?
3. Why have efforts to date been in adequate?

3.1 Instream Water Quality Target(s)

1. What is the critical time period for use impairment?
2. What are the measurable endpoints of water quality restoration?
3. Where will the endpoints be monitored?

3.2 Load Capacity

1. What is the maximum loading of a pollutant which will allow a waterbody to meet water quality standards?
2. How does that capacity vary with season and location in the watershed?
3. What is the uncertainty in the loading capacity?

3.3 Estimates of Existing Pollutant Loads

1. How much greater than the loading capacity is the total existing load?
2. What portion of the existing load is natural or background?
3. What is the estimated contribution of each source to the total existing load?
4. How do these contributions vary with season and location in the watershed?
5. What is the uncertainty in the estimates of these loads?

3.4 Load Allocations

1. How much of the load capacity is reserved as a margin of safety?
2. How much of the load capacity is accounted for by background or other existing loads that will not be allocated an reduction?
3. How much will each source have to reduce its load in order to fit within the remaining load capacity?
4. When will these load reductions be met?

FRONT MATTER

Title Page

- **Subbasin Assessment and Total Maximum Daily Load for <Y*our Watershed*>**
- **Date**
- **Author(s)**

Table of Contents

- **for all front matter which follows, the body of report, and the back matter**

List of Figures

- **numbered consecutively in order of appearance, including any figures in appendices**

List of Tables

- **numbered consecutively in order of appearance, including any tables in appendices**

List of Appendices

- **in order of mention in text**

List of Abbreviations

Annotated TMDL Outline

1. EXECUTIVE SUMMARY

Suggested Detail:

1) Watershed at a glance:
   - Area and streams at question
   - Parameters of concern
   - Beneficial uses affected
   - Known sources

2) Key findings
   - Streams requiring TMDLs
   - Key indicators of impairment
   - Water quality targets
   - Major sources and load reductions needed
   - Time by which water quality standards will be met

2. SUBBASIN ASSESSMENT

2.1 Characterization of Watershed

2.1.1 Physical and Biological Characteristics

Narrative, maps, or tables describing location, drainage area, precipitation, runoff, topography, vegetation, soils, geology. Must have map(s) showing major drainages, watershed and sub-watershed boundaries, 303(d) streams, general location within state.

Suggested detail:

1) climate description of a representative station
   - precipitation- mean annual & seasonal distribution
   - temperature - monthly mean highs and lows, extreme highs
   - cloudiness - percent possible sunshine by month from nearest station

2) subbasin characteristics
   - hydrography (Map showing subbasin & sub-watershed boundaries, drainage network, location of weather and flow gaging stations)
   - geology and/or soils (dominate rock and soil types) - describe soil depth, texture, and erodibilty factor
   - topography - elevation, slope, and aspect
   - vegetation - distribution of existing land cover (minimum Anderson level 1)
   - fisheries - key Bull Trout Watersheds, distribution (known occurrence) of sensitive, threatened or endangered aquatic species

3) sub-watershed characteristics (5th field HUC)
   - watershed area (Table listing area and attributes by 5th field HUC)

watershed attributes (landform, dominate aspect, relief ratio, mean elevation, dominant slope, hydrologic regimes, annual or unit area runoff)
current mass wasting potential (e.g., landslide frequency)

4) stream characteristics
narrative description of valley & channel types (e.g., source, transport, and response segments, Rosgen channel types, gradients, width/depth ratios)
general bed sediment character (e.g., granitic parent material-sand size substrate)
riparian characteristic - floodplain width, riparian vegetation type & extent

2.1.2 Cultural Characteristics

Population, cities, counties, state, land ownership, land use, roads, dams, diversions, history. A map showing prominent cultural features would be useful.

Suggested detail:

1) land Use:
map or bar chart of different land uses (Anderson Level 1 or better)
trends in land use
map(s) showing location and types of roads

2) land ownership, cultural features, and population
map showing county boundaries, location of cities, major land ownership, and cultural features such as dams and major NPDES facilities
demographics - brief description of population distribution and trends

3) history and economics
principal economic activities, industries
dates of major water resource activities such as dams & diversions, NPDES facilities
existing local government & civic groups working on water quality issues

2.2 Water Quality Concerns & Status

2.2.1 Water Quality Limited Segments Occurring in the Subbasin

Waterbody name & id, boundaries of water quality limited segment, listed pollutants, when first listed, and source of data for listing. This is best be summarized in a table.

Suggested detail:

1) Narrative description of §303(d) listed segments

2) Map showing the location of listed segments

3) Table listing segments, water body ID, pollutants, etc...

2.2.2 Applicable Water Quality Standards

What are the designated and existing beneficial uses for waterbody and what water quality criteria (narrative & numeric) are relevant in each case?

Suggested detail:

1) Table listing beneficial uses by segment and relevant state criteria including any site specific criteria. Detailed citation of the standards should be left to an appendix.

2) Discuss any evaluation of appropriateness of designated uses or development of site specific criteria that may be pursued.

2.2.3 Summary & Analysis of Existing WQ Data

What water quality data exists, including bio-monitoring and particularly BURP results and what does this data say about beneficial use status and exceedance of criteria? All previously reported data should be cited, any new or previously unreported data should go into an appendix. Cover both listed and unlisted waters. Start with graphical analysis (time series, box plots) & keep statistics simple, medians and percentiles may be more appropriate than means and standard deviation. Look for any discernable trends in water quality or beneficial use status. Identify the key indicators, critical reaches and time periods for use impairment.

Suggested detail:

1) Table of data sources pertinent to subbasin assessment

2) Flow characteristics for a representative station or stations
   - average annual hydrograph (by month or better)
   - average and extreme base and peak flows & bankfull flows
   - any known long term flow trends (i.e., major floods, seasonal patterns, etc..)
   - average annual sediment yield (maybe a sed./discharge ratio)

3) Water column data
   - summarize existing water quality data (e.g., time series)
   - compare water quality data to criteria noting frequency and extent of criteria exceedance, by segment and use, as appropriate
   - are any trends in water quality or criteria exceedance evident

4) Other water quality data
   - summarize macroinvertebrate data (i.e., BURP), stream inventory data (e.g., BLM proper riparian functioning condition), fish counts (BURP or others), and other data as appropriate to pollutant(s) of concern

compare results to any published or other standards (e.g., Forest Plan standards)
are any trends evident

5) Status of Beneficial Uses
what does above data indicate about support status of beneficial uses when Water Body Assessment process is applied
how are beneficial uses being impaired (e.g. lack of overwintering habitat for trout)

6) Conclusions to be Drawn
identify time or times of critical flow for impaired uses
determine which listed streams are truly water quality limited and need a loading analysis
clarify boundaries or extent of water quality criteria exceedances or use impairment identify critical reaches, areas most sensitive to use impairment
identify key indicators of use impairment (e.g., relative volume of fine sediment in pools (V*))

2.2.4 Identify Any Data Gaps

where would additional monitoring clarify beneficial use support status, or better define extent or timing of water quality impairment

Suggested detail:
1) are there pollutants of concern for which data are insufficient to evaluate use impairment (e.g. bacteria and primary contact recreation)
2) is flow regime sufficiently know to quantify periods of critical flow
3) are there streams for which the beneficial use status is “needs verification”
4) where would additional sampling sites allow better resolution of extent of use impairment

2.3 Pollutant Source Inventory

2.3.1 Identify all Sources for Pollutant(s) of Concern

Provide an inventory of known or suspected sources of pollutant(s) including both point sources (type, location, pollutants discharged) and nonpoint sources (acres, location, pollutants yielded). Describe any relation(s) between different pollutants and what is known about the delivery potential to impaired segments of waterbodies. All previously reported data should be cited, any new or previously unreported data should go into an appendix.

Suggested detail:
1) Point Sources
description of any Superfund or RCRA sites
table showing NPDES permitted point sources (location, permit #, permit limits, discharge volume)

table of point sources covered by a general permit (location of each), and description of general permit requirements
list of any unpermitted point sources and what is known about them

2) Nonpoint Sources
table of land use acreage by sub-watershed (5th of 6th field HUC)
identify other sources such as roads, stream crossings, mining sites, etc.
identify natural processes which contribute pollutant loads (e.g. mass wasting)
narrative description of each category of nonpoint source

3) Pollutant Transport
what is known about the relative yield of pollutants from identified sources (by source type and/or subwatershed)
what is know about seasonal pollutant delivery from identified sources
describe relation(s) between pollutants specific to identified sources (i.e. physical or chemical associations)
discuss delivery potential to reaches most sensitive to impairment

2.3.2 Identify Any Data Gaps

where would additional data better define sources of pollution and facilitate later loading estimates

Suggested Detail:
1) Point Sources
are there pollutants of concern generated by existing point source but not currently monitored or for which better data is needed

2) Nonpoint Sources
where are greatest areas of uncertainty in pollution sources
where would more data on pollutant yield or more detailed breakdown of land use be of value

2.4 Summary of Past and Present Pollution Control Efforts

Evaluate successes and failures in pollution control to date. For water quality limited segments, why have efforts to date been inadequate? Are there actions planned which are expected to achieve water quality standards within a reasonable time?

Suggested detail:
1) history of issuance and revision to point source permits
2) other watershed improvement projects (public and private lands)
3) are ongoing activities expected to improve water quality in a reasonable time

3.0 TMDL - LOADING ANALYSIS AND ALLOCATION (For each pollutant)

Regulations allow that "Total maximum daily loads can be expressed in terms of either mass per unit time, toxicity, or other appropriate measures" 40 CFR 130.2(I). *Loads may take non-traditional forms, such as miles of roads of a certain condition, and desired outcome may also take non-traditional form, such as number of active redds, residual pool volume, percent fine, et cetera. If non-traditional pollutant and water quality measures are used the relation of one to the other, and to existing water quality standards, must be clearly explained. Links between pollutants may be used but must be fully explained.*

3.1 Instream Water Quality Target(s)

Goal is to restore "full support of designated beneficial uses" IC 39.3611, 3615

Select the measurable target(s) for instream water quality and loading analysis. This may involve translation of narrative water quality standards to measurable water quality targets. Be specific about beneficial uses protected, locations (waterbodies) where targets apply, and timeframe for reaching goal. If recovery time will be long it is best to specify interim goals.

Suggested Detail:

1) describe design condition(s) paying attention to critical time periods and reaches for impaired beneficial uses

2) target selection

A) Where numeric criteria exist numeric criteria must be met unless site specific criteria are considered

B) With narrative criteria it will be necessary to look to literature and apply local knowledge to come up with appropriate numeric surrogates, start with key indicator(s) identified in the subbasin assessment

identify possible targets levels for key indicator (e.g. if % bed fines is a key indicator what value is appropriate)
describe relation of considered targets to beneficial uses
look for a suitable reference stream and its value for the key indicator
consider surrogates for key indicator(s) taking into account cost & ease of monitoring and any relations between parameters documented in the subbasin assessment
clearly document rationale for target selection

In setting dates for target milestones try to account for lags in recovery and response to load reductions

3) identify monitoring point(s) (typically at downstream end of a listed segment but may be a critical reach further upstream), parameters to be monitored and methods. A detailed monitoring plan and feedback loop will follow from this in the implementation plan.

3.2 Load Capacity

Determine maximum load each waterbody can accommodate and still meet water quality standards. Must be at a level to meet " ... water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge ...", CWA §303(d)(C). *Likely sources of uncertainty include lack of knowledge of assimilative capacity, uncertain relation of selected target(s) to beneficial use(s), and variability in target measurement. The time period for which loading is calculated needs to be appropriate to the nature of the pollutant and use impairment, e.g. for the episodic discharge of sediment from nonpoint sources filling pools an annual average load is more appropriate than a daily load.*

Suggested detail:

1) summarize or reference the method(s) of estimation (put details in an appendix)

2) describe all assumptions made

3) discuss sources and degree of uncertainty in estimate

4) describe how load capacity changes with season (based on critical time periods for beneficial uses and flow regime described in subbasin assessment) and location in the waterbody

5) present load capacity for each parameter or related parameters with season and location of application

3.3 Estimates of Existing Pollutant Loads

Regulations allow that loadings "... may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading". 40 CFR 130.2(I). *An estimate must be made for each point source. Non-point sources are typically estimated based on type of source (land use) and area, such as subwatershed, but may be aggregated by type of source or land area. If possible, background loads should be distinguished from man-caused increases in nonpoint loads.*

Suggested detail:

1) summarize or reference the method(s) of estimation (put details in an appendix)

2) describe the data used and all assumptions made

3) discuss sources and degree of uncertainty in estimates

4) be sure to consider seasonal variation in loads characteristic of each source type

5) present loading rates for each parameter

What is background load and extent to which it is purely background or aggregated with other non-point loads. Remember 'background' is load which is not reducible.

Wasteloads are from point sources - summarized in table by source (location, type, load [annual range if known], NPDES permit #, etc.)

Loads are from non-point sources - summarized in a table by sub-basin and/or land use (location, type, load [annual range if possible], estimation method)

3.4 Load Allocation

The total allocations must include a margin of safety to take into account seasonal variability and uncertainty. Uncertainty arises in selection of water quality targets, load capacity and estimates of existing loads, and may be attributed to incomplete knowledge or understanding of system, assimilation not well known, lack of data, or variability in data. The margin of safety is effectively a reduction in loading capacity which 'comes off the top', i.e. before any allocation to sources. Second in line is the background load, a further reduction in loading capacity available for allocation. It is also prudent to allow for growth by reserving a portion of the remaining available load for future sources.

Apportion load capacity among existing and future pollutant sources. Allocations may take into account equitable cost, cost effectiveness, and credit for prior efforts but all within the ceiling of remaining available load. These allocations may take the form of percent reductions rather than actual loads. Each point source must receive an allocation. Non-point sources may be allocated by subwatershed, land use, responsibility for actions, or a combination. It is not necessary to allocate a reduction in load for all nonpoint sources so long as water quality targets can be met.

Suggested detail:

1) Margin of Safety
   summarize sources of uncertainty discussed in previous two sections
   describe any conservative assumptions in target selection or load estimation and use of critical design conditions that contribute to an implied margin of safety
   present any explicit margin of safety used

2) Background
   carry forward existing background load from section 3.3
   note inclusion of any unallocated nonpoint sources

3) Reserve
   discuss any allowance made for future growth, e.g. new or expanded point sources or expansion of nonpoint source activities

4) Apportion remaining available load, these are future loading targets, to the extent possible taking into account both spatial (location) and temporal (seasonal) distribution of sources

each point source must receive an allocation (a.k.a. Waste Load Allocation)
nonpoint sources can be allocated by subwatershed, land use category, responsibility for actions, or a combination (a.k.a. Load Allocation)
not all nonpoint sources need to be allocated as long as water quality targets can be met by reductions in those sources that do receive an allocation
allocations are best summarized in a table or tables
a time must be specified by which each (or all) allocations will be met
pollutant trading comes after allocations have been made

4.0 REFERENCES

Includes all literature cited in the main body of text or appendices

BACK MATTER

Appendices (these are where most of the supporting data goes, as well as model output, etc.)

Glossary

Chronology (perhaps, of significant events in TMDL development timeline)

Distribution list (who is supposed to receive a copy of this document)

Attachment D - Example Data Request Letter

January 1, 1998

Interested Party
Near a water quality limited stream
Anywhere, Idaho 88888

Dear Sir/Madam:

The Idaho Division of Environmental Quality (DEQ) is developing a total maximum daily load (TMDL) for the <Subbasin Name> subbasin (4th field Hydrologic Unit Number <8 digit code>). This TMDL is scheduled for submittal to the Environmental Protection Agency (EPA) by Dec. 31, <year due>.

Our first step in TMDL development is a subbasin assessment. This assessment will be used to develop a loading analysis. The contents of an assessment and loading analysis are described in the attached condensed TMDL outline.

To assist us in ensuring that its assessment and loading analysis are based on the best available information, we are soliciting information you may have on the <subbasin name> with regard to the following subject areas:

- Water Quality Concerns and Status
- Pollutant Sources
- Prior and Existing Pollution Control Efforts

Specifically the following types of information are requested:

- water column chemistry data;
- physical data - including thermograph, channel stability ratings, riparian proper functioning condition, etc.;
- bio-assessment data, particularly aquatic insect and fish sampling results;
- data on location, size, types of specific land uses such as timber harvests, croplands, grazing allotments, and other nonpoint sources of listed pollutants in the watersheds of the attached lists of streams;
- and documentation of previous, ongoing, and planned actions to control those sources of pollution and their effectiveness.

We request your reply by March 31st, <year before due>. The data requested should be no more than five years old, though older data may be useful if more recent data is unavailable. Data should be in summary form along with appropriate interpretations, and data should be provided in a computer readable format with the format specified in a cover letter (e.g. Lotus ver 5, d-Base for Windows, Word Perfect 6.1). Please send your pertinent data to <regional office contact> at <OR address> along with the name or names or persons that can answer questions about the data provided.

If you have questions about the types of data requested, think other data may be relevant, or have general questions about the TMDL development process please contact Davy Crocket, 208-yyy-xxxx.

Sincerely,

Davy Crocket
DEQ TMDL Developer

Attachment E - Example TMDL Workplan

This example skeleton workplan is for a subbasin of medium complexity and assumes a January 1 start two years before the TMDL is due. Greater detail is encouraged on a project specific basis. The workplan will need to be compressed if the start has been delayed. Simpler subbasins could be completed in less time and more complicated subbasins may take longer to complete. For complex subbasins an earlier start will be required.

1. **Jan 1 to Mar 31 - Scoping, including request of data and information from agencies and industry for the subbasin**

2. **Apr 1 to Jun 30 - Prepare draft Subbasin Assessment (SBA)**

3. **July - Present draft SBA to WAG or BAG and take comments**

4. **Aug and Sep - Consider WAG/BAG comments and revise SBA**

5. **Sep 30 - Revised draft SBA ready**

6. **Oct 1 to Oct 15 - SBA technical edit**

7. **Oct 15 - SBA complete**

8. **Oct 16 to Oct 30 - Select water quality targets**

9. **Nov 1 to Feb 28 - Prepare drafts loading analysis (LA)**

10. **Mar - Present draft LA to WAG or BAG**

11. **Apr to Jun - Consider WAG/BAG comments and revise LA**

12. **Jun 30 - Revised draft LA ready**

13. **Jul 1 to Jul 15 - Combine SBA and LA and prepare executive summary**

14. **Jul 16 to Jul 31 - Draft TMDL technical edit and legal review**

15. **Aug 1 to Aug 15 - Prepare Draft TMDL for public comment**

16. **Aug 16 to Sep 15 - Public comment period (30 days)**

17. **Sep 16 to Oct 15 - Prepare public comment response summary and submittal package**

18. **Oct 16 to Nov 14 - Final legal/administrative review**

19. **Nov 15 - Final TMDL package ready to be submitted**.