Final Statewide 303(d) Workload Assessment

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Final Statewide 303(d) Workload Assessment

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Introduction

Section 303(d) of the federal Clean Water Act requires states to develop a list of polluted waterbodies every two years. For each of those waterbodies, the law requires states to develop Total Maximum Daily Loads (TMDLs). A TMDL is the amount of pollutant loading that can occur in a given waterbody (river, marine water, wetland, stream, or lake) without becoming polluted. TMDLs are implemented through permits to point source dischargers and through non-regulatory programs for nonpoint sources.

The Washington State Department of Ecology is currently working under a memorandum of agreement (MOA) with the U.S. Environmental Protection Agency to address all polluted waterbodies on the 1996 303(d) list over a 15-year period. The MOA was developed in conjunction with a settlement between EPA and environmental interest groups who sued EPA over delays in completing TMDLs. The Ecology/EPA MOA was signed in October 1997.

In 1998, we at Ecology estimated the total TMDL program cost (to comply with the MOA) by developing a TMDL workload model (Wrye, 1998). This model served as the basis for redirecting existing staff and requesting additional resources from the State Legislature and EPA.

Two and one-half years after this initial workload model was developed, we decided to re-examine the TMDL program, seeking improvements in operations and refining workload estimates. This report presents a new workload model based on improvements to the existing program and the addition of new TMDL staff. With this model we assessed the State's ability to comply with the 15-year schedule of the MOA and examined our ability to meet federal requirements associated with the 1998 303(d) list.

Improvements to Washington's TMDL Program

Over the last year, Ecology undertook an internal process to evaluate our current approach for developing TMDLs. In this analysis we examined our obligations relative to the MOA and our long-term obligations associated with current and future 303(d) lists.

We began with a broad evaluation of our current approaches to TMDL development. The improvements will be implemented by three Ecology programs:

- Water Quality Program (WQP)
- Environmental Assessment Program (EAP)
- Toxics Cleanup Program (TCP)

The following efficiency improvements emerged from this process.

1. Single entry into the watershed

Our TMDL projects to date have usually addressed a subset of listings within a particular geographic area. For example, TMDL studies often addressed dissolved oxygen or bacteria but not temperature. There were several reasons for this, one of the main ones being that we had not developed an EPA-approved approach for some parameter types, including temperature and contaminated sediments.

We now plan to comprehensively address all 303(d) listings within a given geographic area, to the extent possible. The TMDL submittal report to EPA will contain "chapters" addressing different parameter types. This will allow greater efficiencies in public involvement, implementation, and the overall TMDL process. It will also gain some efficiency in sampling and technical analyses; however, separate technical studies for different parameters will still be needed in most cases.

2. Larger geographic areas

Our annual workload scoping process has often resulted in high-priority projects for relatively small geographic areas. For example, a critical tributary may have been singled out for study due to fish habitat concerns or a local watershed group's involvement. We now realize that to address all of the listings statewide in the remaining 12 years, projects covering larger geographic areas will be necessary. The most common scale will be about one-half to one-third of a Water Resource Inventory Area, although sizes will vary by geographic area and complexity of the situation.

3. Maximize use of existing data

We plan to take full advantage of all water quality studies that have been performed in the areas of interest. Where sufficient data exist to complete a TMDL or de-list a waterbody, no additional data collection will be undertaken.

4. Match level of technical rigor to study objectives

For point source TMDLs, pollutant-control implementation measures are directly related to the technical study findings. The cost of implementation is sensitive to the final allocation quantities. The level of technical rigor of these studies is necessarily high.

For nonpoint TMDLs, the implementation measures tend to be relatively insensitive to the exact load allocation. For example, for bacteria TMDLs, the implementation measures will tend to be similar whether the TMDL calls for a 60% or 30% reduction in loading. Therefore, a very high level of technical rigor may not be necessary to meet the TMDL objectives for nonpoint sources. More emphasis will be placed on follow-up monitoring.

The success of nonpoint TMDLs is tied directly to the commitment of local parties to implement the necessary control measures. Local commitment is usually greater if there is local involvement in the technical study: for example, through collaborative data collection. This collaborative approach may sometimes result in lower technical rigor. For nonpoint TMDLs, we recognize that local involvement is often more important than a high level of technical rigor.

5. Standardized, streamlined technical approaches

To date, Ecology's TMDL program can be characterized as being in a development phase. We now have enough experience to move into more of a production mode for TMDLs. To that end, we are developing standardized approaches for temperature, bacteria, dissolved oxygen, and nutrients. This will allow the projects to be conducted more efficiently.

By assigning more people for a shorter time period, the project duration for complex TMDL technical analyses is expected to be shorter than many past projects. The assumed duration for complex TMDLs is reduced to about two years, after the completion of a preliminary "assessment and design" phase. The assumed duration of most other types of technical analyses is one year.

Washington State has adopted Sediment Management Standards (SMS) for marine sediments, which have been approved by EPA as an element of the state's water quality standards. Using the criteria in the SMS, the sediments in some areas of Puget Sound have been determined to be in violation of the standards and have been placed on the 303(d) list. Contaminated sediments can occur due to historic toxic discharges and/or ongoing sources.

This workload assessment assumes that data collection, technical analysis, decision-making, cleanup, and source control activities (i.e., cleanup plans) will be conducted for such sediments under the requirements of the traditional toxic cleanup laws and programs (e.g., CERCLA, RCRA, and MTCA). They will provide the primary means to ensure that these sediments are cleaned up to meet standards. A further assumption is that these sediment cleanup plans can function as TMDLs under the federal Clean Water Act (CWA). To test the degree to which these assumptions are met, a pilot program is underway involving the cleanup of contaminated sediments in Bellingham Bay. Ecology's Toxics Cleanup Program is in charge of this effort.

6. Pragmatic decisions

We recognize that TMDLs are often controversial, with many policy and technical issues associated with each study. To meet our settlement agreement, pragmatic decisions will need to be made to stay on schedule. We will need to make reasonable decisions and move on.

7. Organizational efficiencies

To improve efficiency, the TMDL technical work will be more specialized than at present. Teams of technical staff will conduct TMDLs using standardized approaches. The initial teams are proposed to consist of 1) Temperature, 2) Complex/medium, 3) Simple Nonpoint, and 4) Toxics. Each team will produce a chapter of the final technical TMDL report for a given watershed (not all elements will be needed for each watershed). In addition, tasks and essential functions for staff in both EAP and WQP will be matched to appropriate job classifications.

8. Administrative efficiencies

The following administrative efficiencies have been identified:

- Boilerplate quality assurance project plans (QAPPs) and reports. A set of QAPP and report templates will be established for different types of TMDL projects (e.g., temperature, bacteria).
- Data analysis spreadsheet tools will be developed for common analyses, including standard quality assurance calculations and the bacteria statistical "roll-back" approach.
- The EAP technical report will contain all appropriate text for the submittal report, in the form of an executive summary or other section. Therefore, Ecology regional staff will not need to do any summarizing or rewriting of the technical elements. This will result in substantial time savings, based on recent experience.

9. New and redirected staff resources

The Water Quality Program (WQP) and Environmental Assessment Program (EAP) will receive approximately $1.24 million in new Clean Water Act Section 106 funds for next fiscal year. The two programs have agreed to allocate 10 additional full-time employees (FTEs) for EAP and 3.5 additional FTEs for WQP. This decision was based on the assumption that limited EAP resources (for technical analyses and data collection) are currently the primary obstacle to producing TMDLs.

The WQP has examined the work of a wide range of staff and determined that a number of these individuals are engaged in activities that contribute to TMDLs. For the purposes of this effort, these activities are being re-directed toward long-term TMDL objectives. Examples of this change are forestry staff working with the U.S. Forest Service on their TMDL requirements, and coordination of agricultural technical assistance efforts to correspond with local TMDL efforts. These re-directs and additional new resources are reflected in the workload and productivity estimates that follow.

10. Workload prioritization

WQP and EAP have evaluated the workload for the next two years and identified a specific set of projects for the FY02 and FY03 time periods. In particular, the programs are concerned about meeting their first "balloon payment" due under the Settlement Agreement MOA in FY03.

With this in mind, high priority will be given to completing TMDLs for approximately 40 lakes. Management plans have been completed for these lakes; we will use these plans as the basis for load allocations and implementation planning. We will also focus attention on approximately 50 303(d) listings for toxic compounds. Due to changes in analytical methods and questionable sampling protocols, we intend to re-sample and determine if any of these should be de-listed. In addition, other TMDLs will be developed in FY02-03 as part of our current ongoing project list.

11. Columbia Basin TMDLs

We have recently reached agreement with Oregon and Idaho on a commitment to develop TMDLs for dissolved gas and temperature in the mainstem Columbia and Snake rivers. We have allocated 1.6 FTEs (one from EAP and 0.6 from WQP) to participate in the technical and policy aspects of the process. The WQP position will also oversee TMDL work in the Columbia Basin and help develop an agreement that would delegate TMDL development for the area to the U.S. Bureau of Reclamation (0.4 FTE).

In addition, Washington, Idaho, and Oregon asked the Western Governor's Association to facilitate the agreements needed to complete these TMDLs. The Western Governor's Association agreed to do this and has assigned a staff person to the project.

12. New accountability measures

In association with EAP and EPA, the WQP has recently completed a review of TMDL accountability procedures within Ecology. We acknowledge the need to manage flow of information and to work in a more structured fashion, especially among Ecology programs and EPA. We will incorporate this plan into Ecology TMDL development guidelines.

These changes address the responsibilities of the lead organization and management accountability. We will establish formal coordination among EAP, WQP, and TCP. We will make organizational improvements within each of the various WQP sections working on TMDLs. Teams (led by WQP Leads) will become the primary internal coordination unit for each TMDL. They will include members of WQP, EAP, EPA, local watershed planning leads, and other programs if appropriate. We will reconfigure data systems to improve tracking of 303(d) listings and TMDL development milestones.

13. Coordination with Watershed Planning Act

The WQP has been concerned about the duplication of efforts and the confusion associated with multiple watershed processes underway in Washington. To bridge the gap between the WQP TMDL efforts and Ecology's implementation of the Watershed Planning Act (HB 2514), lead staff from both programs identified several ways to improve coordination.

The 2514 Watershed Leads will help create opportunities for TMDL Leads to coordinate with various watershed planning units. The objective of this coordination is to engage the planning units in identifying priorities and concerns, and to assist with the issues related to implementation. The WQP hopes that these needs and findings will ultimately become part of local watershed (2514) plans. In turn, the WQP will strive to provide technical assistance needed to address the water quality issues in the planning unit areas.

14. Public involvement

Over the last year, the WQP has added public involvement staff in each Ecology region and headquarters. This team has been participating in TMDL activities throughout the state and has recently completed a plan for improving the public involvement process associated with TMDLs. This plan will be incorporated into the TMDL guidelines.

Key Components of the New Workload Model

Ecology's new workload analysis is based on the 1998 303(d) list. By 2013, we will need to address 1,577 listings to meet the requirements of the proposed federal TMDL rules. To accomplish this task, we identified three key components of TMDL work.

1. Program administration

This area of TMDL work includes program oversight, coordination, tracking, and reporting. The WQP at Ecology headquarters conducts all these activities. Specific duties in program administration include management of the 303(d) list and public involvement in the listing process, TMDL program coordination and submission, technical review of TMDL documents, coordination of TMDL public involvement, development of groundwater and lakes TMDLs, and legal support for TMDL appeals and the MOA.

Most of the current and long-term staff needs in program administration have been addressed through recent budget increases. We have identified a long-term need to improve our information management systems to keep pace with the complex decisions facing us. We are increasing resources in July 2001, but project additional funds will be needed in the future. Ecology's legal caseload associated with TMDL development and litigation may increase. If this is the case, additional funds will be required to meet this need. These findings are shown in Table 1.

Table 1. Estimated resource costs for TMDL *Program Administration*, HQ Water Quality Program, FY02-13.

Activity	Staffing July 01 (FTEs)	Future Needs (FTEs)	Total Need (FTEs)	Rationale
303(d) data management	1.0		1.0	
303(d) list public involvement	1.0	-0.5	0.5	Shift work to support future coordination needs
TMDL coordination	1.0	0.5	1.5	Increased # TMDLs + requirements for tracking and reporting exceed current capacity
Technical assistance on stakeholder TMDLs	1.0		1.0	
TMDL public involvement coordination	0.8		0.8	
Use attainability analysis/ WQ standards	1.0		1.0	
Surface/groundwater TMDL policy development	0.5		0.5	
Lakes TMDLs	0.3		0.3	
FERC licenses	0.5		0.5	
Management/ tech and sec Support	1.7		1.7	
WMS Total	**8.8**	**0**	**8.8**	
Program management	0.4		0.4	
Point source TMDLs	0.5		0.5	
Information management	0.5	0.5	1.0	Need to integrate information tracking systems for 303(d), TMDLs, permits, etc.
Legal support	0.5	0.5	1.0	Additional workload in appeals may exceed current capacity
TOTALS	**10.7**	**1.0**	**11.7**	

2. Technical analysis

This function includes the data collection and analysis steps associated with TMDL development. Specific activities include researching previous studies, coordinating with other monitoring entities, developing a QAPP, conducting field sampling studies, conducting laboratory analytical work, modeling hydrology and water quality, determining assimilative capacity and load allocations, reporting on study findings, and providing technical assistance to local planning units who develop TMDLs. This technical analysis is conducted almost entirely within EAP.

The process we used to estimate costs for this function was as follows:

- All 303(d) listings were grouped into technical analysis projects by geographic area, listed parameters, and local initiatives.
- Projects were grouped into 21 categories of similar types.
- Resources needed for each category type were estimated. Resources included staff and laboratory analytical costs.

Table 2 presents resource estimates for completing the technical analysis for all 1998 303(d) listings. Complex and temperature TMDL projects are most noteworthy from a workload perspective, accounting for nearly one-third of the remaining technical work. The addition of 10 FTEs from the CWA 106 grant increase brings the technical analysis component of the TMDL program to nearly 67% of projected staffing needs.

Table 2. Estimated resource costs for TMDL *Technical Analysis*, Environmental Assessment Program, FY02-FY13.

Project Type	Description	Number of listings	Assumptions	Number of projects	Ave. cost/project		Total cost		Annual cost		Staffing July 01 fte	Deficit fte
					fte-yrs	Lab ($k)	fte-yrs	Lab ($k)	fte	Lab ($k)		
Complex	Large geographic area, multi-parameter	147	Complex modeling	25	3.5	60	88	1500	7.3	125	7.8	1.3
Medium	Smaller area, fewer parameters	62	Some modeling	11	1.8	20	19	220	1.6	18	In Complex	
Simple	Mostly bacteria, NPS, small area	70	No modeling	17	1.0	10	17	170	1.4	14	1.8	-0.1
Temp	Temperature	178	Lab resources are costs for FLIR flights	51	1.2	25	61	1275	5.1	106	3.8	1.3
Nutrients	DO or pH listing due to excess nutrients	14	Need EPA nutrient criteria	6	0.5	7	3	42	0.3	4	In Simple	
Verify	Listing in question, need verification monitoring	155	Includes some de-listings due to criteria changes	33	0.2	16	7	516	0.6	43	In Tox-fish	
Verify TMDL	TMDL for some Verify projects	--	20% of 33 Verify projects turn up positive, need TMDL	7	2.0	124	13	818	1.1	68	In Tox-fish	
Surrogate	Cleanup for different water or parameter should address listing	46	Resources included in effectiveness monitoring	9	0	0	0	0	0.0	0		
Tox-water	Toxics in water column	15	31 water metals listings included in verification project category	4	1.0	54	4	215	0.3	18	In Tox-fish	
Tox-fish	Toxics in fish tissue	61	Complex TMDLs	14	2.0	124	27	1737	2.1	138	3.5	0.6
Tox-sed	Toxics in sediment	51	Some listings require packaging only	5	0.9	7	5	35	0.4	3	1.0	0.1
King Co	KCDNR lead, EAP technical assistance	65	King Co will do some TMDL projects	3	1.3	30	4	90	0.3	8	In Complex & Tox-sed	
Navy	USN lead, EAP technical assistance	101	Navy will do their TMDL projects, EPA involvement	5	1.3	56	7	280	0.6	23	In Complex & Tox-sed	
Lakes	TMDL packaging for Clean Lakes Program listings	31	WQP lead, limited EAP technical assistance role	1	0	0	1	0	0.1	0	In Complex	
Marine	DO and pH listings in Puget Sound	40	PS divided into 5 large geographic areas, lab resources include ship time	5	4.0	100	20	500	1.7	42	0	1.7
F&F	Listing in state or private forest lands	154	Programmatic TMDL through Forest & Fish Agreement	0	0	0	0	0	0.0	0		
USFS	Listing in federal forest lands	28	USFS will do all TMDLs in national forests, EPA assist	0	0	0	0	0	0.0	0		
CR MOA	Temperature and TDG in mainstem Columbia and Snake	30	Temp by EPA, TDG by EAP	1	2.0	0	2	0	0.2	0	0.2	0.0

Table 2 (cont.)

Project Type	Description	Number of listings	Assumptions	Number of projects	Ave. cost/project		Total cost		Annual cost		Staffing July 01 fte	Deficit fte
					fte-yrs	Lab ($k)	fte-yrs	Lab ($k)	fte	Lab ($k)		
Col-Snake	Other listings in mainstem Columbia and Snake	6	Temp, TDG, and toxics listings in other project types	5	2.0	60	10	300	0.8	25	0.8	0.0
CBIP	Columbia Basin Irrigation Project	32	EAP does TMDL unless irrigation districts do through AFW	1	9.0	100	9	100	1.0	15	0	1.0
Isolated	Single isolated listing	6	Good candidate for substitution with later listing	0	0	0	0	0	0.0	0		
Flow support	Stream flow monitoring support								1.5	0	1.5	0.0
Hydrogeo support	Groundwater monitoring support								1.0	0	0.5	0.5
Ambient monitoring	TMDL loads & trends, effectiveness monitoring, statewide monitoring coord, 303(d) tech asst.		Locals lead TMDL effectiveness monitoring, EAP role more limited						6.3	72	3.8	2.5
					FTE total				33.5		25.7	7.8
					Lab total (fte=$k/90)				6.8	616	4.4	2.4
					FLIR total (fte=$k/90)				1.2	106	0.5	0.7
Mngt	Management/ supervision		13% of total FTEs (from '98 workload model)						4.4		3.6	4.7
Clerical/ Data	Clerical support, data management		11.8% of total FTEs (from '98 workload model)						4.0		In Mngt	
					GRAND TOTALS (as fte)				49.8		33.2	16.6

3. Planning, public involvement, and implementation

This function includes the development and packaging of TMDLs, as well as the long-term oversight of implementation activities. WQP works with the public to identify needs and concerns, coordinates studies with EAP, develops implementation plans with communities and other agencies, prepares submittal reports for EPA, and oversees implementation and monitoring activities. Ecology regional staff provide the majority of these services (Table 3).

Current staffing levels in the regions meet approximately 83% of the need associated with 1998 303(d) listings. Determining long-range needs in this arena was a challenging endeavor. Lack of resources for local coordination (i.e., TMDL Leads) is the primary concern. We will address this shortfall by spreading current resources across several Water Quality Management Areas (WQMAs) while working hard to maintain an acceptable level of public involvement and scheduled delivery of TMDLs.

Table 3. Estimated resource costs by regional office for TMDL *Planning, Public Involvement, and Implementation,* Water Quality Program, FY02-13.

Region - WQMA	Staffing July 01 (FTEs)	Future Needs (FTEs)	Total Need (FTEs)	Rationale
NWRO				
Nooksack - San Juan	1.0		1.0	
Skagit - Stillaguamish	0.5	0.5	1.0	Full-time lead is needed
Kitsap	0.5	0.5	1.0	Full-time lead is needed
Island - Snohomish	1.0		1.0	
Cedar - Green	2.0		2.0	
Public Involvement	1.0	0.75	1.75	Increase public involvement in Nooksack and Snohomish
Mgmt/ tech & sec support	0.75		0.75	
TOTAL STAFF	**6.75**	**1.75**	**8.5**	
SWRO				
West Olympic	1.0		1.0	
East Olympic	0.5		0.5	
South Puget Sound	0.6	0.5	1.1	Full-time lead is needed
Lower Columbia	0.5		0.5	
Columbia Gorge	0.7		0.7	
Public Involvement	0.9		0.9	
Technical Lead	1.0		1.0	
Mgmt/ tech & sec support	1.8	1.0	2.8	Additional helper for leads
TOTAL STAFF	**7.0**	**1.5**	**8.5**	

Table 3 (cont.)

Region - WQMA	Staffing July 01 (FTEs)	Future Needs (FTEs)	Total Need (FTEs)	Rationale
CRO				
Horseheaven-Klickitat	0.25		0.25	
Lower Yakima	1.5	0.5	2.0	
Upper Yakima	1.25		1.25	
Wenatchee	0.5	0.5	1.0	No staff currently. Expect TMDL activity to begin this year
Okanogan	1.0		1.0	
Monitoring		0.5	0.5	Focus on Yakima project implementation
Mgmt/ tech & sec support	0.5		0.5	
TOTAL STAFF	**5.0**	**1.5**	**6.5**	
ERO				
Upper/Lower Snake	1.0		1.0	
Mid Columbia	0.2		0.2	
Esquatzel/Crab Creek	0.2		0.2	
Spokane	0.5	0.5	1.0	Intensive area, need additional lead time
Up Columbia/Pend Oreille	1.0		1.0	
Columbia R MOA TMLDs	0.6		0.6	
Public Involvement	1.0		1.0	
Monitoring	0.1		0.1	
Mgmt/ tech & sec support	1.3		1.3	
TOTAL STAFF	**5.9**	**0.5**	**6.4**	

Results of the New Workload Model

The 1998 workload model estimated a total program cost of 84 FTEs. Ecology's current workload projection is for 92 FTEs. This similar finding appears to validate both models, because different staff and methods were involved in developing the two workload estimates. However, the original model included two key assumptions that were found to be invalid and thus were eliminated from the present model:

- Landscape TMDLs would be completed with minimal resources
- Local governments would complete 10% of the overall TMDL workload

The elimination of these two assumptions accounts for about 15 additional FTEs in the revised model.

Using our new workload model, we determined that current staffing levels (including recent CWA Section 106 increases) will allow Ecology to address approximately 76% of the 1998 303(d) listings in the next 12 years. The results are summarized in Table 4. Our TMDL program is currently staffed at 69.6 FTE. This figure includes 13.5 new FTEs from the 106 grant and several additional FTEs of redirected staff available after July 1, 2001.

Table 4. Summary of staffing levels (July 2001) and total projected need.

TMDL Activity	Staffing Levels After 7/01 (FTE)	Total Projected Need[1] (FTE)	Deficit
Program Administration • WQP HQ + AGO	10.7	11.7	8.5%
Technical Analysis • EAP (includes lab $)	33.2	49.8	33%
Planning Public Involvement & Implementation • Regional WQP • TCP[2]	 24.7 1.0	 29.9 1.0	 17% 0%
TOTALS	69.6	92.4	25%

[1] Estimates based on 1998 303(d) and 12-year schedule (the remainder of our 15-year agreement.)
[2] Assumes TMDL implementation for contaminated marine sediments will be conducted primarily by TCP and EPA through MTCA, CERCLA, and RCRA cleanup actions.

The projected shortfall to address all 1998 303(d) listings in the next 12 years is 22 FTEs, a deficit of 25%. The bulk of the deficit is in the technical analysis area of the program. At the present time, resources in technical analysis have been focused primarily on TMDL development activities, leaving much of the remaining FTE shortfall in TMDL effectiveness monitoring and management/clerical support (Table 2).

TMDL Compliance Schedule

Our final analysis compared the revised workload model projections based on the 1998 303(d) list to our obligations under the MOA. To complete this evaluation, we needed to account for 352 de-listings from the 1996 list and 49 flow listings for which TMDLs are not required. We determined that the most equitable approach to account for these changes was to spread the activities across the three MOA checkpoints (2003, 2008, and 2013). The number of listings assigned to each checkpoint was prorated based on the 1996 listings scheduled at those checkpoints in the original MOA schedule. Table 5 shows the original MOA targets as compared with the proposed targets under this *prorationed* scenario.

Table 5. Comparison of original MOA TMDL schedule with proposed schedule.

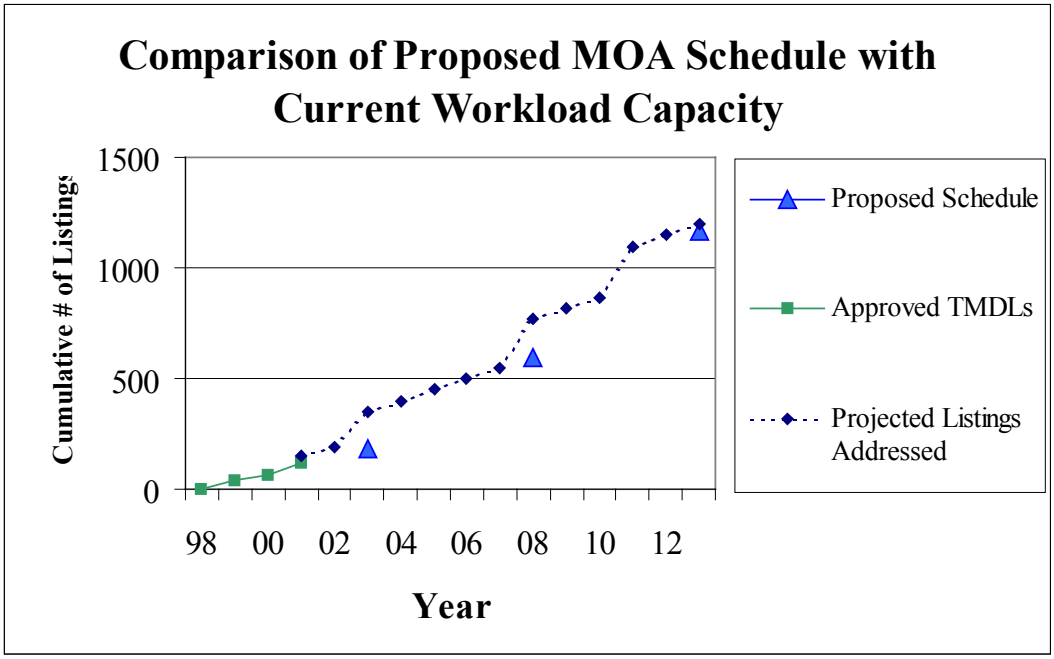
Year	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13
Original MOA Annual TMDLs	59	19	14	24	14	119	44	29	53	15	411	32	13	36	18	666
Original MOA 5-Yr Targets						249					552					765
Proposed MOA 5-Yr Targets[1]						185					412					568
Cumulative Total of Original MOA 5-Yr Targets						249					801					1566
Cumulative Total of Proposed 5-Yr Targets						185					597					1165
TMDLs Currently Approved by EPA	3	33	27	57												
Proposed Schedule to Address Listings[2]				33	39	156	50	50	50	50	216	50	50	232	50	50
Cumulative Listings Addressed by Yr	3	36	63	153	192	348	398	449	499	550	766	816	867	1099	1150	1200
Statewide and cooperative projects[3]:																
Lakes						31										
Toxics Verification						50										
US Navy											101					
King County											65					
Forest and Fish														154		
USFS														28		

[1] Proposed MOA targets based on a proportional reduction of the original MOA targets resulting from de-listings in 1998.

[2] Proposed schedule for addressing listings calculated using a base production rate of 50 listings per year, a function of resources available to EAP. Years scheduled for more than 50 TMDLs include proposed submittal of statewide and cooperative projects.

[3] These projects are included in the totals for "Proposed Schedule to Address Listings."

The graph below shows how Ecology's work schedule (completing TMDLs and/or verifying listings) compares to the proposed adjusted MOA schedule. Using this approach, we estimate we will meet MOA obligations for our 1996 list with existing resources as of July 1, 2001.



Outstanding Issues

We identified the following four issues in the workload analysis, but we have not yet fully addressed them. Each may have workload implications and could result in adjustments to the outputs of the workload model. We will complete scheduling of all project work by July 2001.

1. *TMDL accounting*. Ecology, EPA, and the plaintiffs need to discuss TMDL accounting methods.

2. *TMDLs for stormwater*. Ecology and EPA need to explore options for addressing stormwater listings in TMDLs. We are looking at how local basin planning efforts under the NPDES stormwater permit program may be expanded to include TMDL development.

3. *Delegation of effectiveness monitoring*. We are examining the role local governments and others can play in carrying out effectiveness monitoring. This is a required component of all implementation plans. Our workload model assumes that local entities will conduct much of the TMDL effectiveness monitoring work, with technical assistance from us.

4. *Development of TMDLs for future listings*. EPA's revised 303(d) rule requires states to complete TMDLs on future listed waters within a designated timeframe. Workload implications for these future listings were not addressed in the present model.

Conclusions

Our revised 303(d) workload analysis indicates that we now have adequate resources to meet the Settlement Agreement MOA obligations, contingent on resolution of the outstanding issues noted above. However, we are 25% short of funding needed to address all the 1998 303(d) listings.

We plan to begin implementing the new workload model immediately. One of the first steps is to schedule TMDL projects statewide for single entry into watersheds where possible. With 12 years left in the 15-year settlement term, each project needs to be assigned a start-up year in one of the two remaining 5-year Water Quality Management Area rotations.

Many factors outside of our control will influence the success of this program. Two years from now we will re-evaluate our workload model assumptions to determine if current approaches and level of effort will be adequate to achieve our long-term goals.

Reference

Wrye, D.D., 1998. Total maximum daily loads workload model. Water Quality Program, Washington State Department of Ecology, Olympia WA. Publication No. 98-26. 19+ pp.