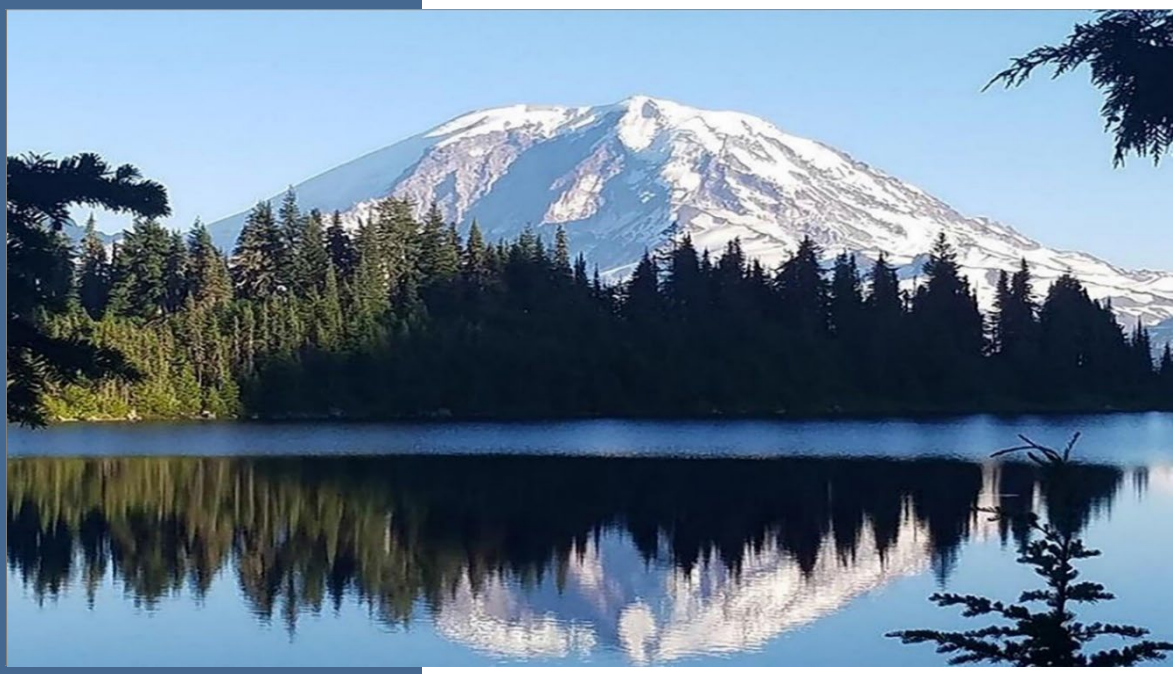

2021 TMDL Workload Assessment

Analysis of Category 5 Listings from 2018 Water Quality Assessment

Water Quality Program

Washington State Department of Ecology

Olympia, Washington

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Contact Information

Water Quality Program

P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6600
Website: Washington State Department of Ecology[1]

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Introduction & Background

Section 303(d) of the federal Clean Water Act requires states to develop a list of polluted waterbodies not attaining their designated uses every two years. In Washington, we call this process the Water Quality Assessment (WQA). Polluted waterbodies are placed in:

Category 5 – Impaired- without a water cleanup plan

Category 4A – Impaired with an approved TMDL

Category 4B – Impaired and implementing an approved water cleanup plan.

For each waterbody identified as impaired, the Clean Water Act requires states to develop TMDLs. A TMDL is the calculation of the maximum amount of a pollutant that can enter a given waterbody (river, marine water, wetland, stream, or lake) so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. Ecology implements TMDLs through permits to point source dischargers and through programs to address nonpoint sources of pollution.

The Department of Ecology submitted the 2018 WQA to the Environmental Protection Agency (EPA) in August 2021. EPA took final action on this WQA in August 2022. As part of their action, EPA deferred action on waterbodies that used the natural conditions part of the Water Quality Standards. EPA placed these waterbodies back into category 5 where Ecology said those assessment units were part of a watershed based TMDL. EPA also placed some waterbodies that we said were covered by existing TMDLs back into category 5 since EPA did not think there was evidence to show those waterbodies were address by the TMDL.

Ecology puts together a workload assessment on all Category 5 listings whenever we complete a new WQA. This provides information on our current workload for TMDLs (i.e., Category 5 listings). It is also an opportunity to reflect on process improvements we have put in place to address impaired waterbodies and complete TMDL work. We also identify new or ongoing challenges that the TMDL program is facing. For this workload assessment, we conducted a course yet comprehensive analysis that will set a baseline for future workload assessments.

History of the TMDL Workload Assessment

The Department of Ecology completes a TMDL workload assessment each time a 303(d) list is completed. This is a formal way to evaluate 303(d) list trends, document TMDL program process improvements, and estimate potential future water cleanup projects. The TMDL program comprises a significant amount of resources for Ecology's Water Quality Program (WQP) and Environmental Assessment Program (EAP). The TMDL program is also highly litigated. Therefore, regular analysis and documentation of the program is a key function associated with our submittal of each 303(d) list.

The 303(d) list acts as our "to do" list of TMDLs we need to develop. The approval of each new 303(d) list is an important time to look back at what we have accomplished since the last WQA, identify process improvements that we have put into place, and discuss TMDL program challenges.

This TMDL workload assessment is developed in conjunction with EAP. The first TMDL workload assessment was done in 2001. That initial report recommended completing a TMDL workload assessment after each 303(d) list submittal. It also recommended forming a team of managers that would be responsible for TMDL production: the **Accountability Team**. The Accountability Team (A-Team) is composed of all relevant section managers from EAP and WQP. The primary goal of the A-Team is making sure Ecology meets milestones, legal agreements, and EPA schedule on TMDLs and to address challenges the TMDL program is facing. The A-Team meets quarterly, and an EPA representative usually attends as well.

In developing this current TMDL Workload Assessment, one of our key goals was to develop a more systematic and defined process to serve as a template for future workload assessments. Past workload assessments were done differently by each regional office, making it difficult to roll up all the information into a consistent, statewide analysis. The need for this common baseline approach is underscored by high staff turnover, where we lost institutional knowledge in how this analysis was done for each of our regions. It is our intent to use this analysis (of the 2018 303(d) list) and the procedures established as a baseline for subsequent work to estimate TMDL work and priorities in future workload analyses. This TMDL Workload Assessment report documents the process that was followed for the 2018 303(d) list, creating a good foundation for more routine and efficient workload analyses to be conducted in subsequent years.

See past workload assessment reports below:

- 2001 Final Statewide 303(d) Workload Assessment[2]
- 2006 TMDL Workload Assessment[3]
- 2016 TMDL Workload Assessment[4]

Washington's Water Quality Assessment

In the past several years, a significant amount of work has gone into Washington's WQA to improve efficiency and increase the usability of the online map and query tools.

In 2015, the freshwater segmentation system for the WQA was upgraded to the national hydrography dataset (NHD), establishing more of a confluence-to-confluence type of hydrologic mapping system. Marine waters and some brackish waters are still segmented using a grid system. Washington developed an interactive mapping system called the Water Quality Atlas to display GIS layers such as the WQA categories, waste discharge permits, water quality standards, and TMDLs.

This last WQA, known as the 2018 WQA, was submitted to EPA in 2021 and approved in 2022. For this WQA, Ecology developed new automation tools to download, standardize, and analyze data. With the automation of data and other improvements now in place, we hope to produce future WQAs in a timelier manner. The Clean Water Act states that WQAs are to be submitted

[2] https://apps.ecology.wa.gov/publications/documents/0103018.pdf
[3] https://apps.ecology.wa.gov/publications/documents/0610092.pdf
[4] https://apps.ecology.wa.gov/publications/documents/1710021.pdf

to EPA every two years. The automation tools will help us get closer to meeting that requirement.

TMDLs and Other Restoration Approaches

In 2013, EPA finalized a new collaborative framework for implementing the Clean Water Act (CWA) Section 303(d) program with states — A Long-Term Vision for Assessment, Restoration and Protection under the Clean Water Act Section 303(d) Program[5]. The program vision details enhancements made to the CWA 303(d) program informed by the experience gained over the preceding two decades in assessing and reporting on water quality and in developing tens of thousands of TMDLs. It was intended to enhance overall efficiency of the CWA 303(d) program and in particular encourage focusing attention on priority waters and acknowledge that states have flexibility in using other available tools in addition to TMDLs to attain water quality restoration and protection.

As discussed in the 2016 workload assessment, Ecology pursued Straight to Implementation (STI) projects in some watersheds in an effort to get water cleanup actions/best management practices on the ground faster. While TMDLs continue to be the primary CWA tool for addressing impairments, we believe other restoration approaches, like STIs, can help us meet the goal of identifying, developing, and implementing the most effective approaches for restoring water quality before we need to do a costly and time intensive TMDL.

The goal of both TMDLs and other restoration projects is to clean up the waterbody and meet water quality standards. To reach that goal, STIs and other restoration projects focus on **doing**, not planning. While there is still a planning step, STIs and these other projects move to implementation actions quicker than the traditional TMDL process. In the appropriate situations, other restoration approaches that are just focused on addressing nonpoint sources of pollution are a valuable tool for restoring impaired waterways more efficiently and effectively than a traditional TMDL process that requires significant modeling resources.

When determining the type of water cleanup project (TMDL, STI or other restoration approach) to assign a group of impairments (or listings) within a given area, one needs to consider the potential complexity of the project and degree of resources needed. In addition, it is important to consider the likelihood of success based on local support and risks in each watershed. Furthermore, because WA considers more than just water data when creating the 303(d) list, the basis of the listing should also be considered, in addition to the unique characteristics of the pollutant itself, and whether there are other regulatory programs already in place to address the problem.

Determining the resource needs, complexity, and risks of a given project include the following considerations:

- Existing information and monitoring data (all relevant media),
- Severity and magnitude of the pollutant(s),

[5] https://www.epa.gov/tmdl/2013-vision-implementing-cwa-section-303d-impaired-waters-program-responsibilities#vision

- Degree of known sources within the watershed that may be contributing to the pollution, including the presence of point source dischargers,
- Local interest in moving forward to clean up waters,
- Other regulatory efforts that are underway to implement actions to meet water quality standards,
- Past successes or failures of other cleanup projects that have similar characteristics to the given watershed.

The following descriptions on complexity provide considerations for moving forward with a specific type of cleanup project.

Table 1. Complexity Definitions for Cleanup Projects

Complexity definitions for TMDL or Other Restoration Approach
Higher complexity A TMDL or other restoration approach of higher complexity would be those projects that have a higher degree of resources and time that will be needed to develop and implement the project. Examples are: a TMDL in a watershed that has predominant point sources or is a mixed watershed of both point and nonpoint sources; where monitoring and modeling will need to be done to develop the load/wasteload allocations; or a restoration approach that encompasses a broader urbanized geographic area (such as Spokane River Dissolved Oxygen TMDL or Puget Sound Nutrient Project). Factors to be taken into consideration include: • The watershed or geographic area is dominated by point sources, or has both point and nonpoint sources significantly contributing to pollution; • Pollution control strategies are not readily identified; • The watershed or geographic area covers a broader hydrologic area; • More extensive monitoring is needed to evaluate fate & transport, and to determine sources; • Modeling is needed to determine contributions; • The area is more urbanized, thus more extensive outreach and/or community-based pollution prevention activities are needed to achieve pollution reductions.
Moderate complexity The TMDL or other restoration approach of moderate complexity would be those projects that require a moderate degree of resources and time that will be needed to develop and implement the project. Examples are a TMDL that already has monitoring done and would need minimal or no modeling, or a restoration approach that is predominately made up of nonpoint sources and has an active local government supportive of the cleanup effort. Factors to be taken into consideration include: • The watershed or geographic area has few or no point sources (other than stormwater) and can be controlled through known BMPs; • Some pollution control strategies are already identified;

Complexity definitions for TMDL or Other Restoration Approach
• Some monitoring is needed; • A local governing entity and/or environmental restoration group is very supportive of the restoration effort.
Low complexity A project of low complexity would be those projects that are considered to require a low degree of resources and less time will be needed to develop and implement the project. Examples include STI or ARA projects where we would not want to use expensive modeling resources. These programs would be done prior to a TMDL. Factors that to be taken into consideration include: • Nonpoint sources are the dominant contributor; • Pollution control strategies/BMPs to control the pollution are known; • The watershed is hydrologically small; • The watershed is primarily rural; • Landowners and/or local governing entities supportive of the effort.

Total Maximum Daily Load Prioritization

The resources and complexity to develop TMDLs is high given the need to do modeling and come up with waste load allocations for point sources and load allocations for nonpoint sources. A waterbody or watershed with the following characteristics tends to be a good candidate for TMDL development:

- Predominance of point source permits contributing to the pollution,
- Modeling is needed to determine the allocation of pollution to permit sources,
- More extensive monitoring is needed to determine sources and where they are contributing to the pollution.

TMDL Priorities

EPAs ATTAINS (Assessment and Total Maximum Daily Load Tracking and Implementation System) national database is used to track state water cleanup projects. Within the system, each state is required to prioritize cleanup of impaired waterbodies. Waterbodies can be classified as high, medium, or low priority, with states having the autonomy to identify how to define each of those categories. At this time, Ecology populates ATTAINS with information about completed TMDLs only.

The Water Quality Program's Policy for WQA Listing Methodology Policy 1-11 to meet Clean Water Act Requirements states that Ecology will prioritize Category 5 waterbodies for TMDL development and submit priorities to EPA as part of the WQA package.

Ecology's Water Quality Assessment policy 1-11[6] uses several criteria to prioritize TMDL development, including:

- Severity of the pollution problem
- Risks to public health
- Risks to threatened and endangered species
- Vulnerability of water bodies to degradation
- Waterbodies where a new or more stringent permit limit is needed for point sources
- Local support and interest in a watershed

Additionally, Ecology will consider tribal treaty rights and include environmental justice (EJ) considerations when prioritizing TMDLs, using EJ screening tools to better understand and address potential impacts of the TMDL prioritization process on overburdened communities. Ecology's regional offices engage directly with local organizations and governments to obtain input about local priorities that can inform TMDL prioritization. An example is the many active Salmon Recovery Forums in the Northwest Region that were formed to collectively address Endangered Species Act objectives.

Every October, Ecology holds an annual public TMDL Prioritization webinar to present the water quality improvement projects we are planning to work on in the upcoming year state-wide. The purpose of this webinar is to communicate our TMDL work, gauge participant interest in our selected projects as well as solicit feedback on other locations where there may be interest or external resources available.

Other Restoration Approaches prior to a TMDL

A waterbody or watershed may be a suitable candidate for an alternative restoration project when on-the-ground implementation actions can occur more efficiently and effectively than the time and resources needed to do a TMDL. These waterbodies remain in Category 5 until an active pollution reduction program is developed and the corrective actions detailed in the plan are implemented and demonstrating continual improvement. Only when all of these conditions are met is the waterbody moved to Category 4B. Otherwise, waters will remain in Category 5 until they are clean enough to meet standards, and they are subsequently delisted onto Category 1, or the decision is made to do a TMDL.
Alternative Restoration Approach (ARA) projects can be categorized as follows:

- **Straight to Implementation (STI) –** There is a predominance of nonpoint sources and minimal (ideally none) point source discharges contributing to the pollution, known and established BMPs to control the pollution, typically a rural land base with fewer landowners, small watersheds, and local support. The complexity for an STI is typically low. An example of the STI approach is the Eastern Regional Office Livestock BMP program, which is implemented in several watersheds including, Alpowa Creek, Asotin Creek, Couse Creek, Ten mile Creek, Deadman Creek, Meadow Creek, Steptoe Creek.

[6] https://apps.ecology.wa.gov/publications/documents/1810035.pdf

- **Other Restoration Approaches** – The characteristics of the watershed do not fit a strict STI approach. However, sources are known and point sources are not contributing to the problem, or there are minimal impacts from stormwater discharges that are primarily addressed by requirements in existing general NPDES permits. Some modeling or studies (e.g., source identification studies) may support the effort. There should also be local community support to take actions without waiting for a TMDL to be developed. The complexity for other restoration approaches can vary from low to moderate. An example of this type of approach is the East Fork Lewis River Alternative Restoration Plan.

For both types of approaches, enforceable laws (e.g. 90.48 RCW) or local ordinances must be in place and be used to provide a regulatory backstop to address identified pollution sources.

In addition to the relatively new alternative restoration approaches described above, Washington State has a long-standing program to address contaminated sediments under the Sediment Management Standards (Chapter 173-204 WAC) and the Model Toxics Control Act (Chapter 173-340 WAC). Contaminated sediments are surficial bed sediments where one or more pollutants exceed the sediment quality standards promulgated under Chapter 173-204 WAC. These sediment quality standards are unique in that they are also approved by EPA as water quality standards under the Clean Water Act. Ecology's Toxics Cleanup Program administers the Puget Sound Initiative program that is cleaning up prioritized bays in Puget Sound. More information is available at Puget Sound cleanup - Washington State Department of Ecology. Where 303(d) listings are predominantly based on sediment, or on co-located sediment and tissue data, it is necessary to consider the sediment cleanup efforts as critical elements of an alternative restoration approach. All this work is complicated and expensive and needs to be clearly scoped prior to doing a Sediment Standards and Human Health Criteria Water Quality Standard clean-up project.

Litigation impacting TMDL work

Constructive Submission

Under the Clean Water Act, states are responsible for developing TMDLs and submitting them to EPA. Once a state submits a TMDL to EPA, EPA must approve or disapprove within 30 days. Through the 1980s and early 1990s, most states, including Washington, produced few or no TMDLs. This led environmental groups across the country to file lawsuits against EPA for failing to require the states to fulfil their duties as required by the Clean Water Act. These lawsuits created what is called the **constructive submittal doctrine**.

Under the constructive submittal doctrine, a court may interpret a lengthy failure of a state to submit TMDLs as in fact being a "constructive submission" of no TMDLs. The failure to act is treated as an affirmative act, and EPA's 30-day review period begins. EPA has the duty to approve or disapprove the submission of "no TMDL". If EPA disapproves this constructive submission, EPA would then be required to develop the TMDL. Courts have found constructive submittal where a state has "clearly and unambiguously abandoned" its obligation to submit a

TMDL. The constructive submittal doctrine was developed to prevent states from avoiding the TMDL requirement by simply never submitting a TMDL to EPA.

In 1991, EPA was sued for Washington's failure to produce TMDLs. As part of the settlement agreement for that case, EPA and Ecology developed a memorandum of agreement (MOA) stipulating that TMDLs for all of the polluted waters on the 1996 303(d) list would be completed by 2013. A unique feature of the settlement agreement for Washington was a requirement that each TMDL was to have an implementation plan that would describe what point source and the nonpoint source activities are needed comply with state water quality standards.

As the 2013 deadline approached, it became clear that EPA and Ecology would not complete TMDLs for all the waters on the 1996 303(d) List. EPA, Ecology, and the litigants attempted to renegotiate the settlement agreement but were ultimately unsuccessful. The litigants reinitiated the lawsuit 2020.

The constructive submission theory has also been extended to individual waterbodies. There have been three waterbody-specific constructive submittal cases in Washington State.

In 2017, a coalition of environmental groups filed a citizen suit asserting that the constructive submission doctrine was triggered in the Columbia and Lower Snake Rivers. The plaintiffs argued that EPA violated the Clean Water Act by failing to issue a temperature TMDL for the Columbia and Lower Snake Rivers (two interstate rivers), after Washington and Oregon allegedly made a constructive submission to the EPA by signaling, they would not produce a TMDL.

The facts of the case were in many ways unique. Since the 1990s Washington and Oregon listed the rivers for violating the temperature water quality standards. In 2000, Washington and Oregon entered into a memorandum of agreement (MOA) with the EPA, which assigned EPA the duty of developing and issuing a temperature TMDL for the Columbia and Snake Rivers. The MOA provided that after EPA issued the TMDL, the states would develop implementation plans.

In September and October of 2001, respectively, Washington and Oregon each sent letters to the EPA requesting that the EPA develop the temperature TMDL and issue it. Both states acknowledged that they would then implement the EPA-produced TMDL. Washington's letter stated that it "would like to clarify that our expectation and desire is that EPA both lead the development of and issue the TMDLs for temperature in Washington." In a letter to the Columbia River Inter-Tribal Fish Commission in January of 2002, EPA, consistent with Washington's and Oregon's letters, stated that "at the request of the states of Oregon and Washington, EPA will be doing the technical analysis and issuing temperature TMDLs for the Columbia/Snake River Mainstem in Oregon and Washington."

In accordance with the agreement, EPA published a draft temperature TMDL for the rivers in July 2003. However, due to opposition from the federal hydropower operators, EPA never issued a final temperature TMDL.

In 2019, the U.S. Court of Appeals for the Ninth Circuit ruled in favor of the environmental groups. The Court found the facts in the case, and particularly the MOU, compelling enough to determine that the states had "clearly and unambiguously" decided not to submit a

temperature TMDL. The Ninth Circuit held that "constructive submission will be found where a state has failed over a long period of time to submit a TMDL and clearly and unambiguously decided not to submit a TMDL." The court rejected EPA's argument that EPA's duty to establish a TMDL arises only when a state completely fails to submit any TMDLs. When deciding whether a constructive submittal on an individual TMDL has accorded, the Court will look to whether a state has failed to develop and issue a particular TMDL for a prolonged period of time and has failed to develop a schedule and credible plan for producing that TMDL.

The Court was careful to recognize states still have the authority to prioritize development and issuance of TMDLs. The Court stated:

> "To be clear, the constructive submission doctrine does not prevent a state from prioritizing the development and issuance of a particular TMDL. See BayKeeper, 297 F.3d at 885 ("To interpret [§ 1313(d)(1)(C)] as a requirement of simultaneous submission of the list of polluted waters with the TMDL to correct each polluted water would render meaningless the provision that the TMDLs are to be established in accordance with priority ranking of the listed polluted waters." (internal quotation marks removed)). The CWA itself requires states to "establish a priority ranking" of impaired waters and then develop and issue TMDLs "in accordance with the priority ranking." § 1313(d)(1)(C).
>
> Reading the constructive submission doctrine in this way does not rob states of this ability to prioritize particular TMDLs. Rather, it recognizes a meaningful difference between affording less priority to a particular TMDL and declining to develop and issue that TMDL at all. Where a state has failed to develop and issue a particular TMDL for a prolonged period of time and has failed to develop a schedule and credible plan for producing that TMDL, it has no longer simply failed to prioritize this obligation. Instead, there has been a constructive submission of no TMDL, which triggers the EPA's mandatory duty to act."

A constructive submittal for an individual TMDL was also alleged to have occurred in the Spokane River related to PCBs. The 1996 303(d) list identified five segments of the Spokane River that exceeded water quality standards for PCBs. Subsequent lists included additional listed segments. Ecology prepared a number of documents assessing PCBs in Spokane: 2003 QA Plan: TMDL Study for PCBs in Spokane River[7], 2007 Spokane River TMDL Stormwater Loading Analysis: Final Technical report[8] and in 2011 Ecology released a document titled the "Spokane River PCB Source Assessment[9]."

This led to the formation of the Spokane River Regional Toxics Task Force (SRRTTF). The SRRTTF organized following a protracted of the Dissolved Oxygen TMDL. The community did not want

[7] https://apps.ecology.wa.gov/publications/SummaryPages/0303107.html
[8] https://apps.ecology.wa.gov/publications/SummaryPages/0703055.html
[9] https://apps.ecology.wa.gov/publications/SummaryPages/1103013.html

to go through that experience again and proposed a "Direct to Implementation" approach that would find and remove sources of PCB to the river.

The vision for the SRRTTF was to "work collaboratively to characterize the sources of toxics in the Spokane River and implement appropriate actions needed to make measurable progress towards meeting applicable water quality standards for the State of Washington." A group of governmental agencies, private industries and environmental organizations signed a Memorandum of Agreement[10] that formed the SRRTTF. Ecology communicated to EPA a commitment to the working collaboratively with the SRRTTF to address listings. Ecology was also clear that if the SRRTTF was failing to make measurable progress toward meeting applicable water quality criteria for PCBs, Ecology would be obligated to proceed with development of a TMDL or determine an alternative to ensure that water quality standards will be met. Ecology remained committed to proceeding with a TMDL should it be necessary.

In 2011, an environmental group brought a lawsuit against EPA alleging a constructive submittal on the Spokane River. In 2015 the court ruled that a constructive submittal did not occur at that time. However, the court did recognize that a constructive submittal can apply to an individual TMDL "when a state has clearly and unambiguously *abandoned* its obligation to produce a TMDL or TMDLs" and this case came "dangerously close" to being a constructive submittal.

The Court ordered EPA to "work with Ecology to create a definite schedule with concrete goals, including: clear statements on how the Task Force will assist in creating a PCB TMDL in the Spokane River by reducing scientific uncertainty; quantifiable metrics to measure progress toward that goal; regular checkpoints at which Ecology and the EPA will evaluate progress; a reasonable end date, at which time Ecology will finalize and submit the TMDL for the EPA's approval or disapproval; and firm commitments to reducing PCB production from known sources in the interim." Ecology met or exceeded all of the metrics and milestones the EPA set out. Ecology's periodic evaluation of Measurable Progress showed that progress was being made in reducing sources of PCBs to the river and achieving water quality standards.

In 2020, the plaintiffs in the case reinitiated the lawsuit alleging that in the intervening years Ecology had constructively submitted the TMDL. EPA reached a settlement agreement with the environmental group in 2022 where EPA agreed to develop and issue the TMDL.

Finally, in 2021 an environmental group filed a citizen suit asserting a constructive submittal of a dissolved oxygen TMDL in Puget Sound.

These constructive submittal cases highlight the importance of having a healthy TMDL program that prioritizes, develops, and submits TMDLs to EPA.

Natural conditions

In 2014, an environmental group filed a complaint in U.S. District Court for the Western District of Washington (Case No. 2:14-cv-0196-RSM) challenging, among other things, EPA's approval of Washington's natural conditions provisions (WAC 173-201A-200(1)(c)(i), 173-201A-210(1)(c)(i),

[10] http://srrttf.org/wp-content/uploads/2012/07/SRRTTF-MOA-Final-1-23-2012.pdf

173- 201A-200(1)(c)(v), 173-201A-200(1)(d)(i), 173-201A-210(1)(d)(i), 173-201A-200(1)(d)(ii), and 173- 201A-260(1)(a)). This challenge followed a successful challenge to Oregon's natural conditions provisions (brought by the same environmental group).

As a part of a settlement agreement, EPA committed to reconsider Washington's natural conditions provisions. In November 2021, EPA disapproved several important sections of Washington's Water Quality Standards related to natural conditions:

- WAC 173-201A-260(1)(a): Natural and irreversible human conditions
- WAC 173-201A-200(1)(c)(i) and WAC 173-201A-210(1)(c)(i): Allowable human contribution to natural conditions provisions for aquatic life temperature (fresh water and marine water, respectively)
- WAC 173-201A-200(1)(d)(i) and WAC 173-201A-210(1)(d)(i): Allowable human contribution to natural conditions provisions for aquatic life dissolved oxygen (fresh water and marine water, respectively)

The natural condition provisions of Washington Water Quality standards are key for addressing temperature, dissolved oxygen, and pH impaired listings. Potential new TMDL projects that need to address these water quality standards are a low priority until Washington State and EPA have a clear approach to resolving natural conditions concerns.

A Retrospective: Challenges and Improvements

Program Recommendations to improve TMDL development

During the time since the last workload analysis, processes have changed with the goal of making TMDL development more streamlined and efficient. Both the Environmental Assessment Program and Water Quality Program identified issues that needed attention in order to improve our TMDL Program. Both programs were frustrated with overall project management of the TMDL projects.
Below is a list of the issues identified by staff and managers from the Water Quality and Environmental Assessment Programs. These issues were taken to the Accountability Team (A-Team) and there were several process improvements that were then put into place to address identified issues. Each Program met separately to identify issues and to identify some proposed solutions.

Identified issues and implemented process changes:

A. **Issue:** Water Quality Program needs to have a better process in place to **vet project proposals** before WQP submits them to EAP. It is clear that EAP has limited resources and the WQP needs to make sure to only ask for EAP resources to support the WQP TMDL Program's highest priorities.

   Implemented solutions:

   The Water Quality program holds an annual meeting (Soiree with the WQP Program Management Team). New projects are presented, and each section ranks their new requests with their existing EAP projects. This is designed to make sure only the highest priority projects move forward and that all managers in WQP are tracking old asks with their new asks and they have worked to clear EAP projects off the "to do" list. supportive of what moves forward.
   Old and new projects are reviewed and reprioritized for EAP on an annual basis. The prioritization happens in the following three buckets since most EAP resources are regionally based and the HQ sections have requests that are more statewide:

   SWRO/NWRO (Puget Sound in this bucket)
   CRO/ERO
   PDS/WMS

   This prioritization step is negotiated amongst the WQP sections. That way EAP knows WQP priorities and can try to assign staff according to the water quality program priorities. Ideally this makes sure WQP is speaking with one voice (or 3 since 3 prioritized lists are done for resources that are assigned regionally) on our Program Priorities to EAP.

B. **Issue:** WQP needs to **better manage the existing projects** and have a commitment to completing them.

Historically WQP sections would submit several projects to EAP and EAP would try to do as many as they could with the resources they had for that next fiscal year. There was no

prioritization by the program and depending on the year, there could be a significant ask by each section. More projects would be added without completing the old ones, leaving EAP with an ever-growing list of projects to complete.

WQP needs to design a priority setting process that can dovetail with how EAP manages their workload.

Implemented solutions:

In the past, WQP continued to ask for more projects, yet and did not focus on concluding existing projects. This created a backlog of unfinished projects that impacted EAPs ability to do new take on more work. To be more thoughtful and deliberate about project proposals to EAP, now WQP Program Management Team (PMT) meets annually (collectively known as the Soiree) and each section manager presents to PMT the new EAP projects they are proposing for the upcoming fiscal year, including old projects that needed to be re-scoped. At the Soiree, the proposed projects are discussed, and some are sent back for more work before being submitted to EAP for consideration. Some projects are rejected for not aligning with program priorities. All projects that PMT agrees to move forward are then ranked along with ongoing projects in priority order based on location and EAP resource allocation (Westside of the state ranks together, Eastside of the state ranks together, and two HQ sections rank together).

WQP now ranks all existing and new projects submitted to EAP. That way we aware of lingering projects and know where new projects rank relative to existing projects.

Old and new projects get prioritized for EAP on an annual basis. The prioritization happens in the following three buckets since most EAP resources are regionally based and the HQ sections have requests that are more statewide:

SWRO/NWRO (Puget Sound in this bucket)
CRO/ERO
PDS/WMS

This prioritization step is negotiated amongst the WQP sections. That way EAP knows WQP priorities and can shoot for meeting them. Also makes sure WQP is speaking with one voice on our Program Priorities to EAP.

C. Issue: need **a better estimate of resources** needed to complete TMDL projects. Estimating Carryover & Planning for Multi-Year Projects is a challenge and is not built into project planning. Since EAP only schedules by each fiscal year, when multiyear projects get added and, then are not completed it starts to create a larger list of projects. This is especially true if WQP adds new projects and then does not prioritize the multi-year projects.

D. **Issue:** many proposed WQP projects were not well scoped and far more complicated than anticipated. As a result, projects were taking much longer to complete and were much more expensive than initially expected.

Implemented solutions:

All new TMDLs are now fully scoped prior to investing significant resources in the project. Each of the programs made a commitment to assign resources to fully scope new TMDLs prior to starting them. A new project scoping template was developed that guides the process. Once

the detailed scope of the project is developed it is required to go through peer review. We did this to make sure we understand any potential issues that might come up prior to investing modeling resources, to make sure we're not under designing or over designing resources, and to identify other parts of the program that needed to be actively involved, such as individual or general permit writers. In addition, we hope that the peer review component would further cross region/program training and coordination. To date there have been very few new TMDL project scoping proposals because of limited EAP resources and a concerted effort to clean up the backlog of EAP projects not completed.

This new scoping process adds time to the TMDL schedule, and it is important to do this work at least 1 year in advance of asking for EAP resources to start the TMDL.

Goal: Make sure we are starting each project with a clear understanding of resources needed the schedule for completion and any potential policy issues that might impact other parts of the Program Agency. Create and use a peer review process to scope and vet project proposals. A detailed scoping form for these TMDLs was developed so that staff could use it as the foundation for these new TMDL starts.

To keep well developed and scoped projects moving forward and using limited resources, all new TMDL starts will have a detailed scope of the TMDL project before the project starts. That detailed scope, developed by EAP and the WQP will then get a peer review by other staff. The results of the peer review and the full scope of the project will then be presented to the A-Team for review.

D. Issue: Not enough entry level Field Staff or enough technical staff in EAP to meet the demands.

Implemented solutions:

In 2020, Ecology submitted a budget package to the Washington state legislature requesting additional funding for modeling and field work resources to support TMDL development. These new resources were intended to support developing high-priority, complex Water Cleanup Plans. At the time of the request, Ecology's EAP had a total of ten modelers and field staff performing studies to develop water cleanup plans, primarily for toxics and dissolved oxygen impairments.

The ten existing EAP staff produced one or two water cleanup plans per biennium, which addressed approximately 25 impairments per year. As part of the 2020 budget request, EAP requested eight additional modelers and field staff to allow them to address an additional 22 (on average) impairments per year in prioritized areas across the state. The request stated that if funding and new resources were secured, the additional resources will address dissolved oxygen and toxic pollution that threaten the cool, clean water that Washington residents rely on. The budget request was approved in 2021 and Ecology was successful in securing new EAP resources for water cleanup plan/TMDL production. Unfortunately, given the employment market at this time, it will take up to 3 years for the new employees hired into these new positions to get fully trained so that they can perform at or above the historical rate.

We need to make sure those new resources are dedicated toward completing water cleanup plans/TMDLs that are priorities for the WQP and projects that meet litigation agreements.

E. Issue: Managing the impacts of the delays between TMDL Technical Work (EAP) & final TMDL development/Implementation and submittal to EPA (WQP). EAP Technical staff want to be done and move on to a new project but sometimes the work languishes in the WQP.

Implemented solutions:

In 2019, WQP developed a milestone document to have standardized project process updates. The intent of the milestones checklist document is to track and understand the status of our water quality improvement projects, report progress on the projects to EPA, and to help identify stalled projects in a standardized and efficient way.

TMDL Unit Supervisors from each region work with the TMDL Program Planner to fill out a standardized checklist for each active project to identify what phase the project is in and gauge whether the project has stalled. When it appears a project has stalled, we then look for possible solutions to move the project forward.

In addition, the scoping process should help anticipate key thorny policy/technical issues ahead of time so that the two programs can plan for how they will address them prior to EAP assigning resources.

F. Issue: Significant feedback from EPA that requires more analysis.

Implemented solution:

WQP, in coordination with the Environmental Protection Agency and EAP, developed a TMDL template. The template ensures we are meeting EPA's requirements for TMDL and meets our Agency's accessibility guidelines. This template will continue to streamline technical aspects of the TMDL and provided a clean, easily identifiable format for future TMDL reports.

Adjustments to the TMDL template are expected to occur over time as new issues arise and use of the template identifies areas for improvements.

Table 2. EAP Resources for TMDLs

Summary	# of Positions working on TMDLs	TMDL Dev/Alt Studies	TMDL Imp	TMDL EM	Total FTE
Total Statewide Current (Oct 2021)	4	0.50	0.00	0.60	1.10
Total Westside Current (Oct 2021)	6	4.15	0.00	0.00	4.15
New Westside Expected (FY22)	9	6.15	0.00	0.00	6.15
Pending Westside Position	1	0.95	0.00	0.00	0.95
Total Eastside Current (Oct 2021)	8	4.15	0.07	1.00	5.22
New Eastside Expected (FY22)	2	1.65	0.00	0.00	1.65
Total EAP TMDL Staff (Current, Expected, Pending)	30	17.55	0.07	1.60	19.22
				Total Current FTE (Oct 2021)	11.42
				Total New Expected FTE	7.80

				Total FTE	19.22

Table 3. Water Quality Program Staff working on TMDLs and Alternate Restoration Projects

Location	FTE
Headquarters	2.25
Southwest Regional Office	4.25
Bellingham and Northwest regional Office	5.25
Central Regional Office	2.25
Eastern Regional Office	2.75
TOTAL	**16.75**

2021 TMDL Workload Projections

The federal Clean Water Act requires states to develop a TMDL plan for each water body on the state's polluted waters list, also known as the 303(d) list. This workload assessment is a process we go through to estimate what our schedule is for the next set of TMDLs based on the most current list of impaired waters. This helps with planning and with addressing our TMDL performance measures (Office of Financial management, EPA Bridge metric, TMDL Vision, future settlements).

One of the goals of this workload analysis has been to standardize the assumptions as much as possible so that it could be rolled up for "programmatic accounting". The last two workload analyses were not standardized and that made the rollup of information and assumptions difficult.

For this workload assessment, the WQP developed a consistent process and framework with some common criteria to use for assessing the Category 5 listings. This includes lumping/splitting those listings into potential projects based primarily on geography and in some cases on pollutant type and determining best pathway to get pollution addressed quickly.

This consolidation process included identifying the potential type of project (e.g., TMDL versus STI/ARA), estimating the level of complexity, and generally categorizing the potential projects into high, medium, and low priorities. This effort did not involve any public, tribe or stakeholder process, nor did it involve any specific project scoping. As such, these potential project groupings and priorities are not a final determination. The purpose of this exercise is for workforce planning only.

It is also important to recognize that each region has unique characteristics that may inform their prioritization process differently. After the regional projects were identified and prioritized, the results were rolled up into one spreadsheet to represent the statewide summary.

Challenges Affecting this 2021 Workload Assessment

Lost staff and technical resources

Since the first TMDL Workload Assessment was written in 2001, there has been a dramatic amount of staff turnover in the TMDL Program, leaving a maximum of one experienced TMDL lead staff in each region of the WQP. This has lessened efficiency within the program as onboarding new staff and new supervisors/managers requires basic training, orientation to the work, familiarization with affected waters and interested parties (i.e., Tribes, stakeholders, the public).

Since the 2018 Workload Assessment each of the respective programs have had to manage a great deal of staff and manager turnover. Table 4 shows the number of vacancies that have been filled since the last workload assessment. This not only represents time without these resources, but also time to get new managers and staff up to speed. This loss of experience and staff working in the positions has a significant impact on our TMDL production.

Table 4. Number of TMDL position vacancies filled since the previous workload assessment.

Program	Staff	Unit Supervisors/Section Managers
Environmental Assessment Program	10	4
Water Quality Program	15	3

Litigation affecting TMDL development

The natural condition litigation has created challenges for TMDL development. As outlined above, litigation resulted in EPA reconsidering our natural conditions criteria and disapproving key provisions. Because of the uncertainty around this part of the water quality standards, several projects that would likely rely on natural conditions have been deprioritized or held up. In addition, we also have more 303d Category 5 listings. Replacing the natural conditions provisions will require rule making. That rulemaking is currently underway with draft rule language expected in early 2024.

Balancing TMDL development vs. implementation

TMDLs are not self-implementing. Finding a balance between development and implementation can be tricky. If we continuously develop new TMDLs to address new impaired waterbodies per Clean Water Act requirements, then the resources needed for implementation of older approved TMDLs becomes a challenge. This is a challenge that the program will continue to face as we continue to feel the pressure from stakeholders and EPA to develop more TMDLs. We need to make sure implementation of waste load allocations (in NPDES permits) and load allocations happens in those areas that already have TMDLs. That being said, *this workload analysis is only on producing TMDLs.*

Reflecting the updated Policy 1-11

Ecology made major revisions in 2018 to its guiding policy for assessing water quality data and determining if which waterbody segments or grids are impaired for what pollutants and thus belong on the 303(d) list. Policy 1-11 identifies the wide range of data that Ecology will use to make impairment determinations. This includes water column data as well as sediment data, fish tissue data, fish consumption advisories and benthic invertebrate index information. This also can result in impairment designations for pollutants that are otherwise not currently regulated with numeric water quality standards. The more ways we make impairment determinations, the more variable and complex our water cleanup plan efforts are. For example, the Northwest Region is developing a TMDL to address listings based on benthic invertebrate data. In order to translate the benthic invertebrate-based impairment to a pollutant to which a TMDL study can be applied, the team needed to complete a stressor identification project. That stressor identification effort has led to the development of a TMDL for fine sediments, which encompasses both fine sediments that may be produced from flows as well as fine sediments that may be discharged directly. This has resulted in a complicated and time-consuming TMDL project.

Overview of 2018 Category 5 listings – The 303(d) list

The candidate 2018 WQA was submitted to EPA in August 2021, including 5,530 Category 5 listings. This number is up from 4,548 Category 5 listings on the 2012 WQA, approved by EPA in 2016. All Category 5 listings have been placed into a hypothetical water cleanup project for workforce planning purposes. This attached analysis was done with the candidate list. Therefore, some of these actual listings might be different when compared to the final EPA approved list. It took a year for EPA to conclude their final action and this workload analysis was done in the interim.

Regional Workload Assessment of 2018 Category 5 Listings

Development of workload projections the new category 5 list of impaired waters were completed individually by each region. The goal of this effort was to plan to take on projects to get as many priority projects done and implemented with given resources.

All regions followed the 4-phase process below:

1. **Watershed/pollutant groupings:** Category 5 listings were grouped by watershed or water body and pollutants or pollutant group.
2. **Criteria for determining relative priority:** Relative priority was estimated by considering existing resources, available information, and complexity of the potential project.
3. **Type of Water Cleanup Plan:** Watershed/pollutant groups were then generally assigned a potentially appropriate type of water cleanup plan to most effectively and efficiently work towards clean water (e.g., TMDL, STI/Alternative restoration or other), as well as a hypothetical project name.
4. **Ranking Order for Starting Project:** Identified projects were assigned a priority (high, medium, or low) or ranking order, for starting the water cleanup plan.

The detailed process followed for each of the phases are described further below.

Watershed/pollutant groupings

Each region was provided an excel spreadsheet of Category 5 listings (from the candidate list that was submitted to EPA in August). Regional unit supervisors then worked with regional staff familiar with specific areas in their region to sort listings by waterbody or watershed, as appropriate. Listings were then further split into groups based on pollutant parameter or parameter groups (e.g., conventional pollutants, toxics).

Criteria for determining relative priority

- At a high level this was how regional TMDL staff thought about how to begin sorting their category five listings into projects. This was especially important for new listings. Current status of project planning (e.g., projects already underway or being scoped were given a higher priority)
- Current availability of expertise (e.g., highly complex projects were given a lower priority due to the lack of existing resources and/or expertise)
- Age of available data (e.g., waterbodies with listings based only on limited and old data were given a lower priority for TMDL development even though new data collection is a higher priority in order to confirm current water quality conditions)
- Severity of the pollution problem
- Risks to public health
- Risks to threatened and endangered species
- Vulnerability of water bodies to degradation
- Waterbodies where a new or more stringent permit limit is needed for point sources
- Local support and interest in a watershed
- Environmental Justice

Type of Water Cleanup Project

This phase involved estimating the type of water cleanup project to assign to a group of listings within a given area. Consideration was given to the degree of resources needed and perceived complexity of the project identified. Staff also considered the likelihood of success based on local support and risks of having a successful outcome, including factors such as:

- Existing information and monitoring data,
- Severity and magnitude of the pollutant(s),
- Degree of known sources within the watershed that may be contributing to the pollution, including the presence of point source dischargers,
- Local interest in moving forward to clean up waters,
- Past successes or failures of other cleanup projects that have similar characteristics to the given watershed.

This rough project type assignment is not final and does not reflect the necessary detailed scoping evaluation and stakeholder outreach that is necessary to make an informed decision

about the most appropriate approach for the water cleanup project. See section TMDLs and Other Restoration Approaches for descriptions of different project types.

Ranking Order for Timing of Project

The final phase of regional groupings involved ranking all identified projects in the region by priority order, which would influence how soon a project may start. Each project was assigned High(H), Medium(M), Medium-Low(ML), or Low(L) based the following criteria:

- **High:** Those projects that have already been vetted and are actively being worked on. These projects and the associated Category 5 listings will also be shown in the EPA ATTAINS database as high priority.
- **Medium:** Projects we would reasonably begin working on in the next 1 to 5 years. These projects are influenced by existing staffing capacity and expertise.
- **Medium-Low:** Projects we should begin in the next 5 to 15 years, recognizing that we cannot do everything everywhere at the same time, and that capacity and expertise will begin to change by this time.
- **Low:** Projects that do not warrant starting before the higher prioritized projects. In many cases this is because there are minimal listings (in many cases only one listing) in an area, and/or not enough data gathered to verify that there is problem. Alternatively, the listings are very old and there is no new information to validate the problem. In many cases, verification monitoring would be warranted if we suspect there may or may not be a pollution problem in the given area. Other potential projects may be identified as low priority at this time because the pollutant is ubiquitous, the expertise and tools to address it are currently unavailable, or another regulatory program is addressing the impairment as it is currently defined.

Results of TMDL Workload Assessment for the 2018 WQA

Statewide Summary of Results

The total statewide Category 5 listings are summarized by parameter group in Table 5. The most prevalent impairments statewide are bacteria, temperature, and toxics, followed by dissolved oxygen.

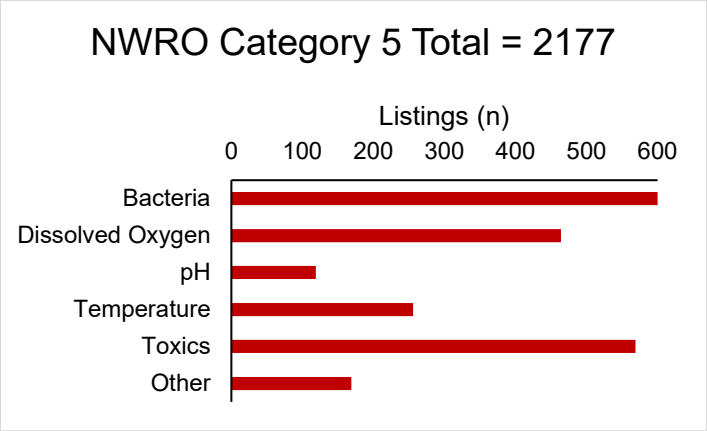
Table 5. Number of Category 5 listings for each region by parameter group.

Parameter	CRO	ERO	NWRO	SWRO	Total
Bacteria	58	173	600	491	1,322
Temperature	266	234	256	568	1,324
Toxics[11]	266	200	569	256	1,291
Dissolved Oxygen	60	216	464	297	1,037
pH	62	169	119	73	423
Other[12]	3	15	169	53	240
Total	715	1,007	2,177	1,738	5637

The following figures summarize Category 5 candidate listings by pollutants for each of the four regions at Ecology. The candidate 2018 WQA was submitted to EPA in August 2021, including **5,530** Category 5 listings. The corresponding text boxes summarize the most common media and chemicals representing the toxics listings in each region. These regional statistics reflect the distinct geographies, human population centers, and development patterns present in each region of the state.

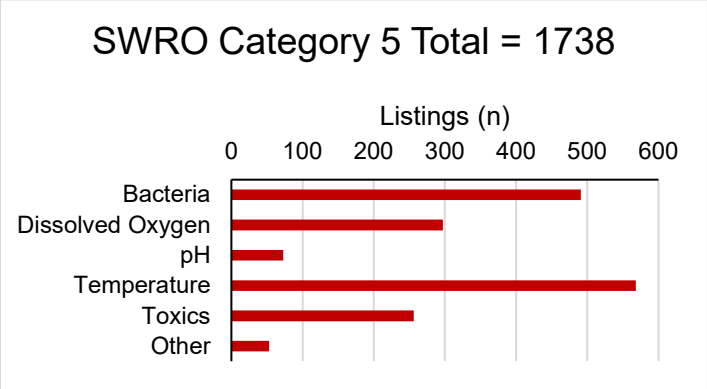
[11] Toxics listings are predominantly from tissue data (related to the protection of human health through fish consumption),

[12] Listings based on narrative criteria, including habitat, bioassessment, and sediment bioassays.



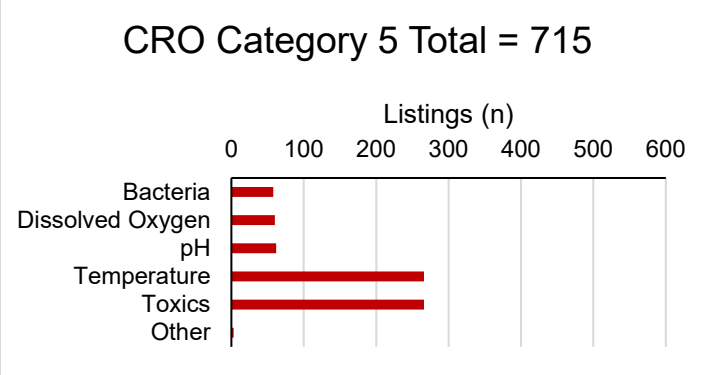
NWRO Toxics (tissue, sediment): PCBs, mercury, chrysene, copper, dioxin

Figure 1. Northwest Regional Office (NWRO) Category 5 listings



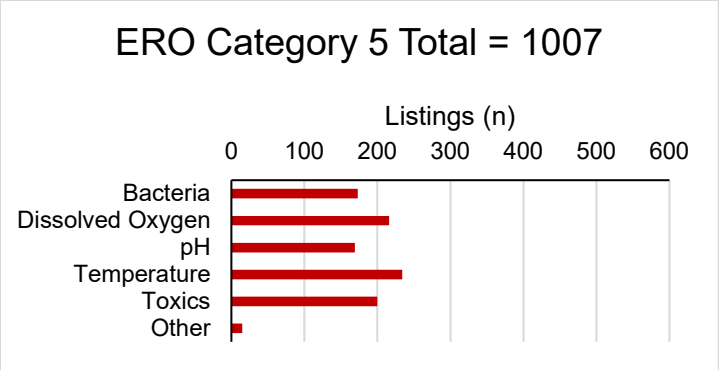
SWRO Toxics (mostly tissue): PCBs. mercury, dioxin, benzopyrene

Figure 2. Southwest Regional Office (SWRO) Category 5 listings



CRO Toxics (mostly tissue): 4,4-DDE, PCBs, 4,4-DDD, mercury, DDT, dieldrin

Figure 3. Central Regional Office (CRO) Category 5 listings



ERO Toxics (mostly tissue): PCBs, Mercury, 4,4-DDE, dieldrin, dioxin

Figure 4. Eastern Regional Office (ERO) Category 5 listings.

Potential Future Water Cleanup Projects

Projected Timing Summaries of Water Cleanup Projects

The following tables provide statewide summary information on the estimated number of projects and associated listings to be initiated over the next 15 years (High, Medium, and Medium-Low ranked projects). Each new 303d list will drive a new workload assessment that will forecast new water cleanup projects. Then the annual soiree will ID water cleanup projects for the next fiscal year. This information is for workforce planning purposes. Actual future water cleanup projects will be scoped and prioritized as described elsewhere in this document.

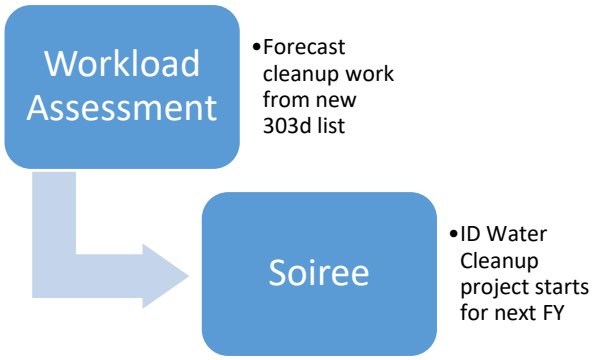


Figure 5. Future process for determining new water cleanup work.

Table 6. High Priority Projects: Active Now (#Projects/#Listings)-Statewide

Cleanup Plan Type	Conventional	Toxics	Other	TOTAL
TMDL	6 /108	1/77	1/10	8 /195
Broad/Regional Other Restoration Approaches	1/48	2/35		3/88
Moderate Other Restoration Approaches	5/142			5/142
STI	4/43			4/43
TOTAL Project/Listings	16/682	3/112	1/10	20/468

Table 7. Medium Priority Projects: Next 5 Years (#Projects/#Listings) –Statewide

Cleanup Plan Type	Conventional	Toxics	Other	TOTAL
TMDL	15/309	3/74		18/383
Broad Other Restoration Approaches				
Moderate Other Restoration Approaches	2/40			2/40
STI	3/145			3/145
TOTAL Project/Listings	20/494	3/74		23/670

Table 8. Medium-Low Priority Projects: 5 – 15 years (#Projects/#Listings) – Statewide

Cleanup Plan Type	Conventional	Toxics	Other	TOTAL
TMDL	26/495	4/108		30/603
Broad/Regional Other Restoration Approaches				
Moderate Other Restoration Approaches	2/58			2/58
STI	14/130			14/130
TOTAL Project/Listings	42/683	4/108		46/791

Listings ranked as Low for initiating a cleanup project were placed as low because they were isolated listings, listings where local efforts and authorities are needed to address the pollution that is all nonpoint (lakes), or projects that we know will take a significant amount of science resources that are currently already working on other TMDL efforts. AKA it will take time for those science resources to come available. (DO and toxics listings) not assigned a potential project type because they take significant EAP resources and we do not think we can anticipate when there will be resources for these more challenging TMDLs.

Table 9. Low Priority Projects: More than 15 years (#Projects/#Listings) –Statewide

Region	Estimated Projects	Category 5 Listings	TOTAL #Projects/Listings
NWRO	228	1213	228/1213
SWRO	92	1388	92/1388
CRO	46	199	46/199
ERO	39	391	39/391
TOTAL	405	3191	405/3191

Observations made from the Low ranked listings include:

- 136 listings are isolated and thus no relevant geographic grouping was available projects only have a single listing.
- 328 projects have from 1 – 9 listings within the project area.
- 102 projects are lakes (representing 227 listings)
- 107 projects are toxics listings (representing 1009 listings)
- 108 multiparameter projects involving D.O. (representing 1476 listings)

For Ecology staff to view the raw data within the spreadsheets, please refer to the 2021 TMDL Workload Statewide Summary spreadsheet[13]. For public access to the spreadsheet data, please contact lara.henderson@ecy.wa.gov.

[13] http://teams/sites/WQ/TMDLDEVAJ/ATeam%20New%20and%20Improved/Workload%20Assessment/2021TMDL%20Workload_StatewideSummary.xlsx