

Total Maximum Daily Loads (TMDLs): Temperature
TMDL Replacement project: **Lower Columbia-Sandy
Subbasin**

Feb. 16, 2024, 1:30 p.m. PT

Public Hearing

Agenda

Time	Topic
1:30 p.m.	Welcome
1:40 p.m.	Inform about the draft rule for the Total Maximum Daily Load
2 p.m.	Inform about the draft rule for the Water Quality Management Plan
2:20 p.m.	Questions and answers about the proposed rule
2:35 p.m.	Formal public comment about the proposed rule

Zoom logistics and meeting ground rules



Raise hand to be recognized for questions



Use chat to: Ask questions

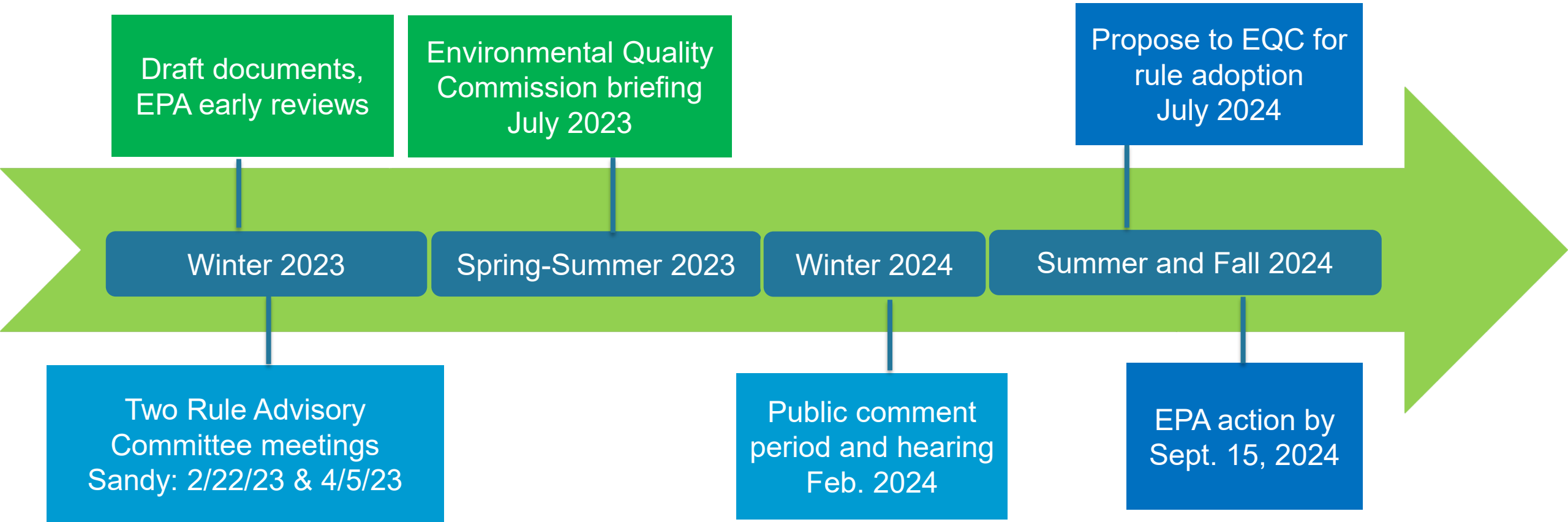


Mute when not speaking



If using phone: press *9 to raise hand, *6 to mute/unmute

Lower Columbia-Sandy Subbasin Temperature TMDL Replacement rulemaking milestones



Project website: <https://www.oregon.gov/deq/wq/tmdls/Pages/tmdlreplacement.aspx>

Temperature TMDL Replacement project litigation

2012: NWEA vs. USEPA, NMFS, USFWS

- Lawsuit was seeking judicial review of the EPA's decision to approve Oregon's revised water quality standards (including the Natural Conditions Criteria) and the Services' "no jeopardy" BiOp.
- Judge found "the EPA was unable to articulate a rationale [sic] basis for its approval of the NCC".
- Court's judgment resulted in EPA's disapproval of the Natural Conditions Criteria.

2019: NWEA vs. USEPA

- Lawsuit asserted the EPA unlawfully approved TMDLs that were based on the now disapproved Natural Conditions Criteria.
- The court issued a judgment on Oct. 4, 2019, requiring DEQ and EPA to replace 15 Oregon temperature TMDLs that were based on the Natural Conditions Criterion and to reissue the temperature TMDLs based on the remaining elements of the temperature criteria.

Website: <https://www.oregon.gov/deq/wq/tmdls/Pages/tmdlreplacement.aspx>

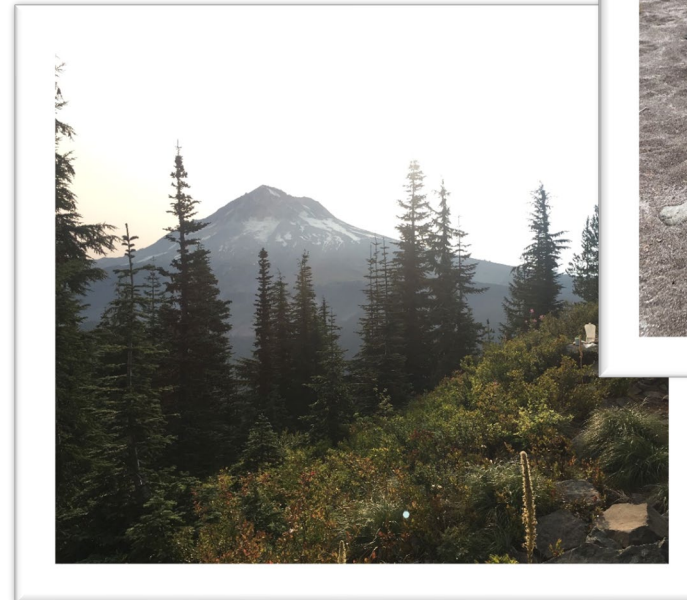
Total Maximum Daily Load: Lower Columbia-Sandy Subbasin



A TMDL, or clean water plan, is a science-based approach to clean up polluted water so it meets state water quality standards.



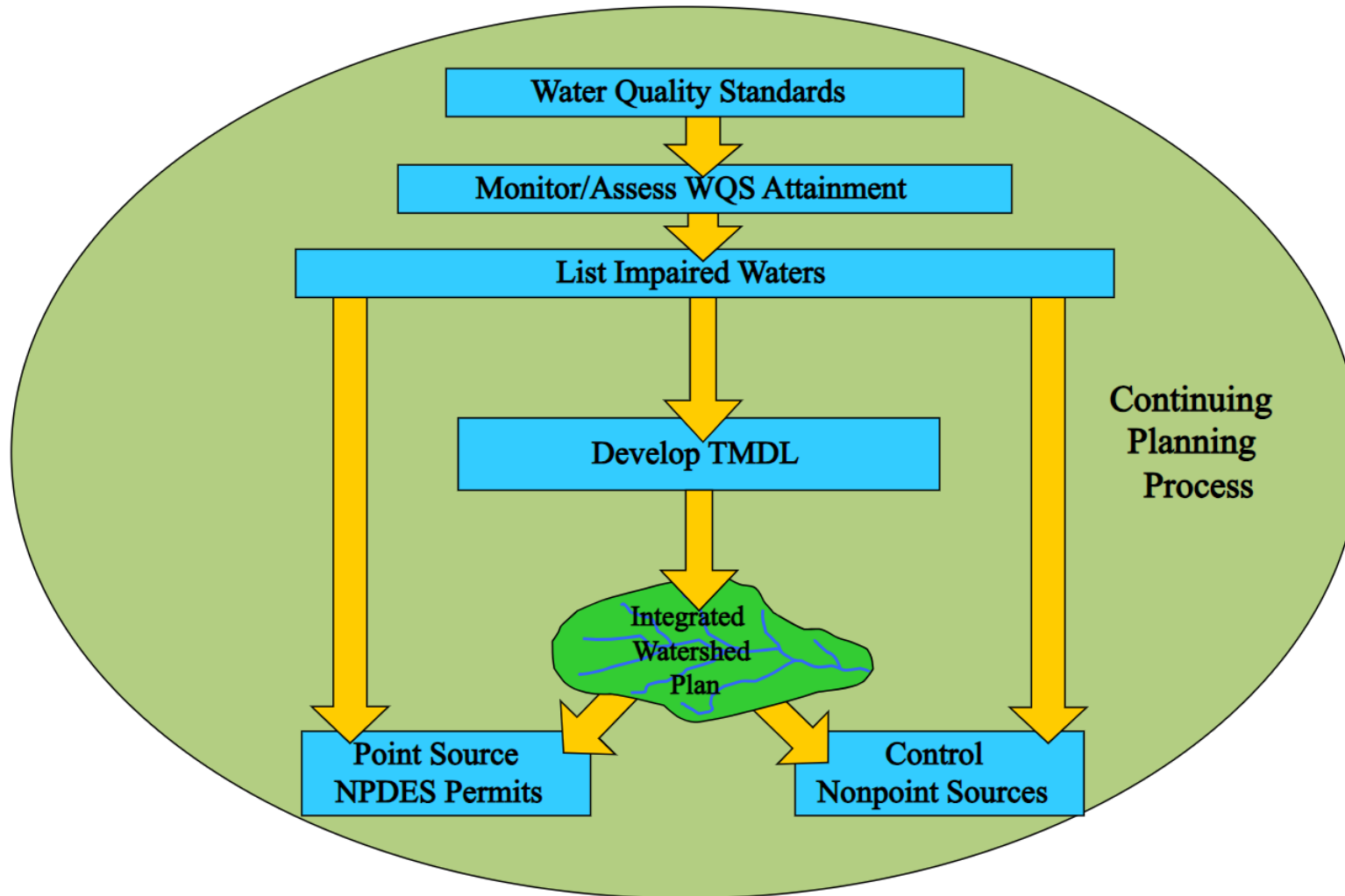
A TMDL is also a numerical value that represents the highest amount of a pollutant a surface water body can receive and still meet the standards. *The numerical value TMDL is also known as a loading capacity.*



Photos: Ryan Michie, Mount Hood from Zigzag Mountain and Sandy River from Oxbow Regional Park

<https://www.oregon.gov/deq/wq/tmdls/Pages/default.aspx>

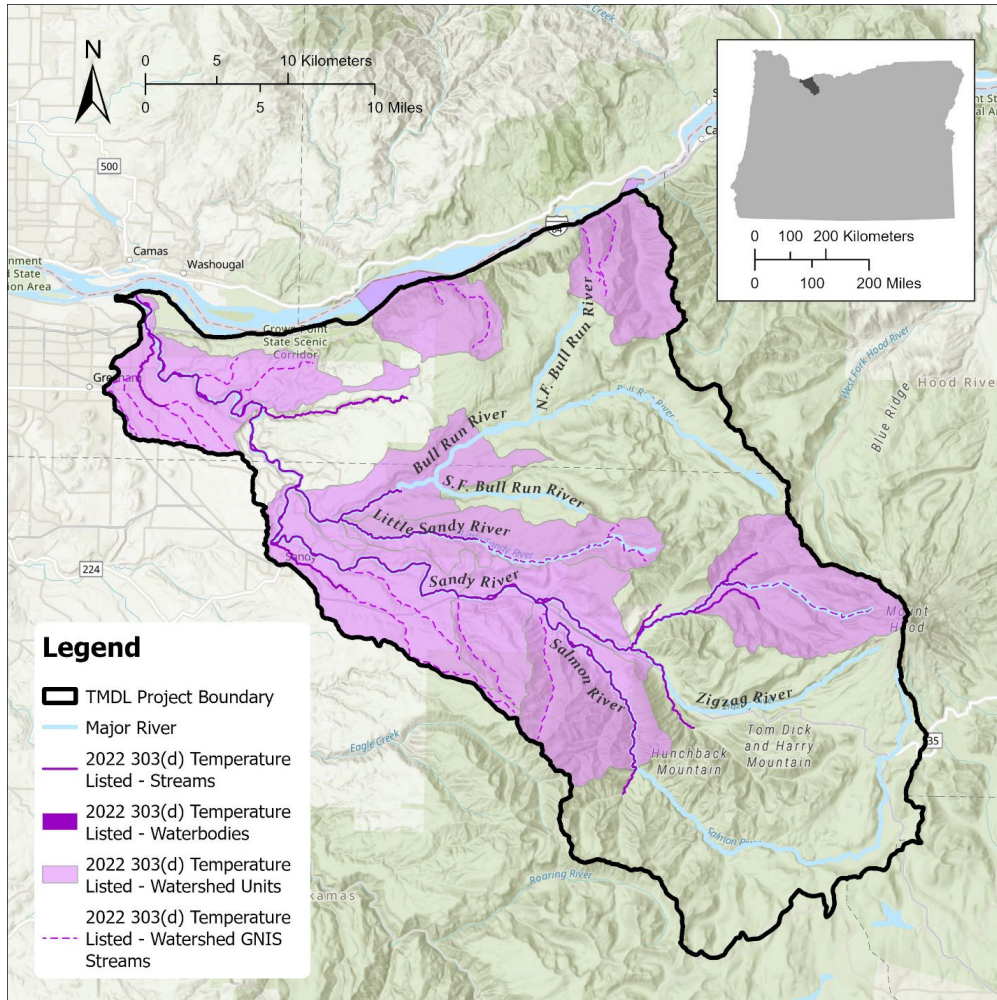
Clean Water Act framework



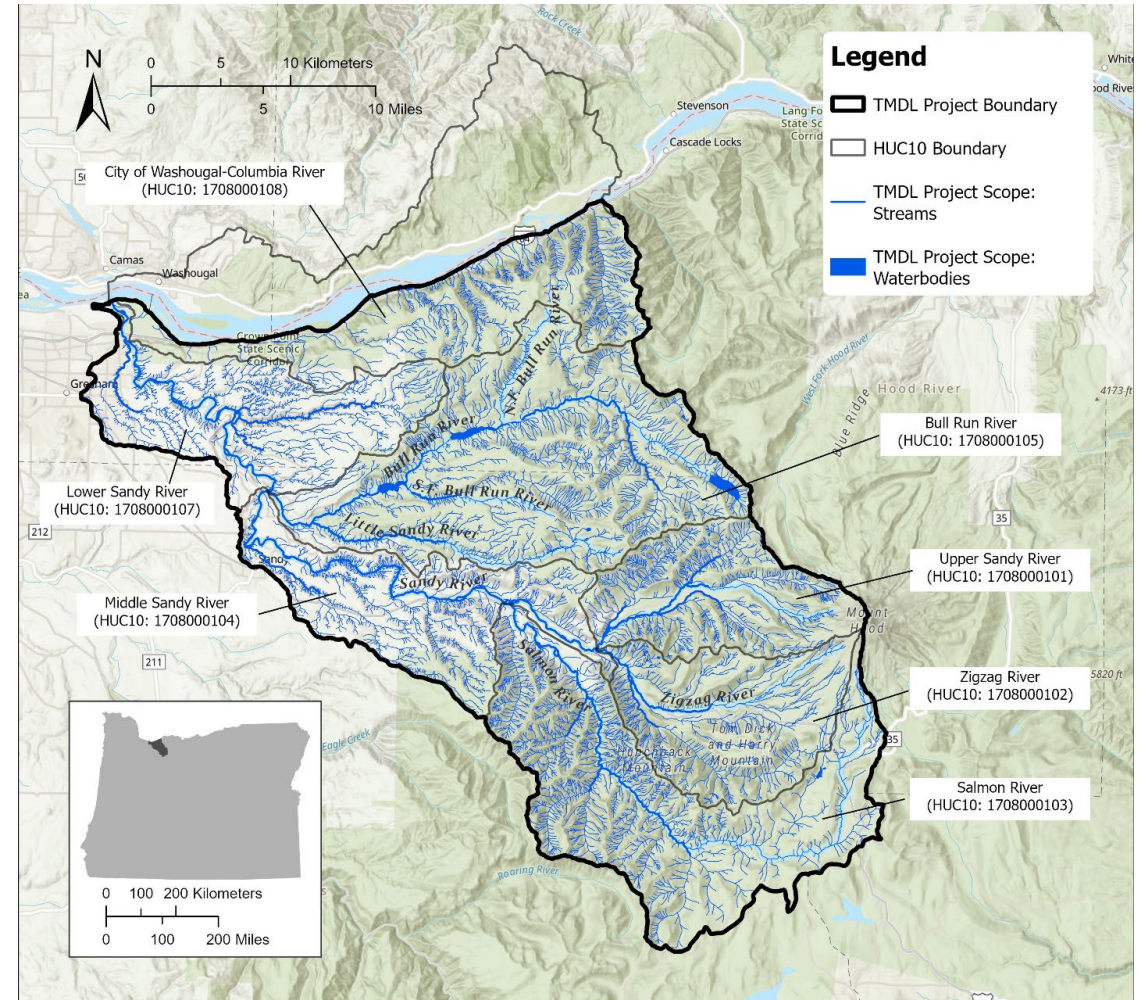
TMDL process

1. Identify water quality concerns
2. Identify pollutant sources
3. Link pollutant sources to water body conditions
4. Calculate the pollutant reduction needed to restore water quality

Lower Columbia-Sandy Subbasin project area



Lower Columbia-Sandy Subbasin Category 5 temperature impairments from the 2022 Integrated Report.



Lower Columbia-Sandy Subbasin temperature TMDLs project area overview.

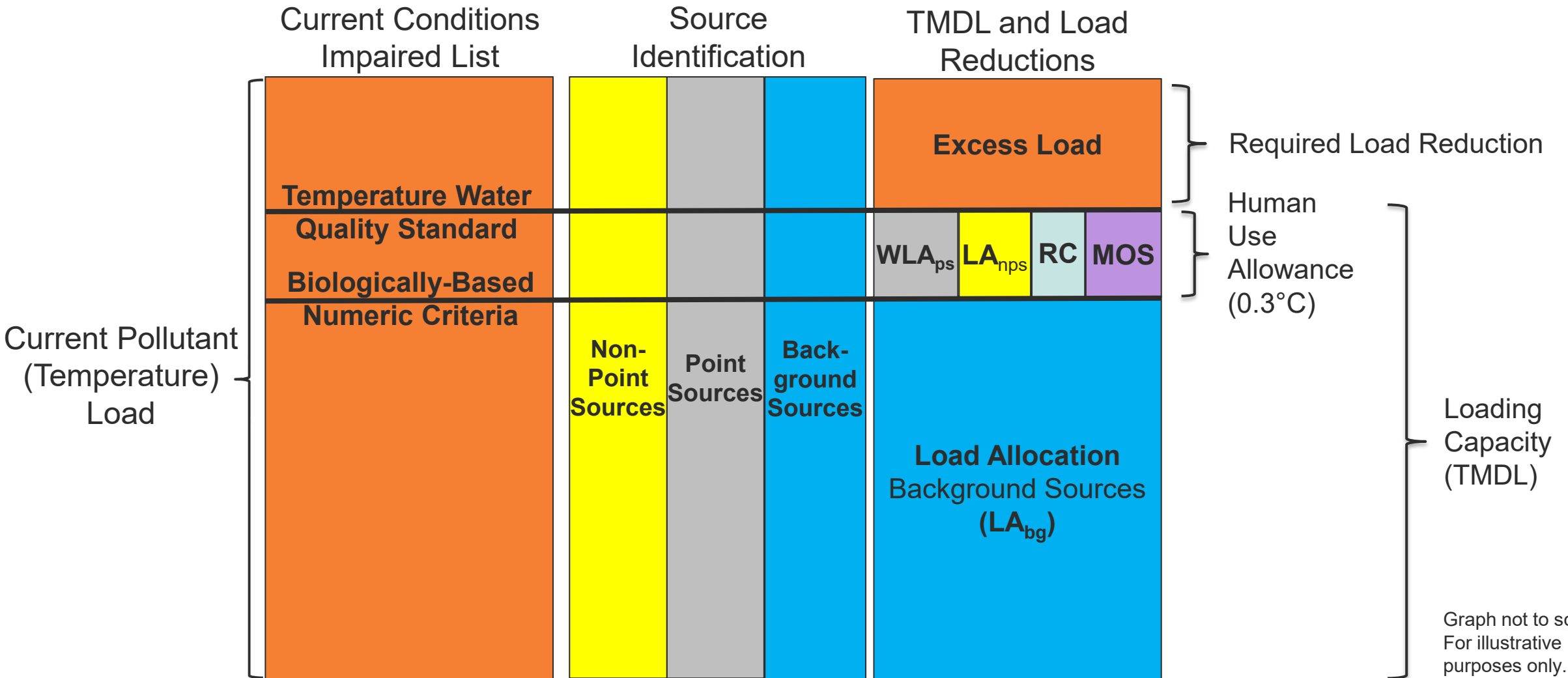
TMDL report section numbers & required elements

1. Introduction
2. TMDL name and location
3. Pollutant identification
4. Water quality standards and beneficial uses
5. Seasonal variation and critical period
6. Temperature water quality data evaluation*
7. Pollutant Sources or Source Categories*
8. Loading Capacity (LC) and Excess Load / Load Reduction*
9. Allocations*
 - 9.1.2 Wasteload Allocations (WLA, for point sources)
 - 9.1.3 Load Allocations (LA, for nonpoint sources)
 - 9.1.4 Surrogate Measures, for heat loading, water temperature & withdrawals
 - 9.1.5 Reserve Capacity (RC)
 - 9.2 Margin of Safety (MOS)
10. Water Quality Management Plan (WQMP)

Reference: [Oregon Administrative Rule 340-042-0040\(4\)](#) and federal regulations: [40 CFR 130.2](#) and [40 CFR 130.7](#)

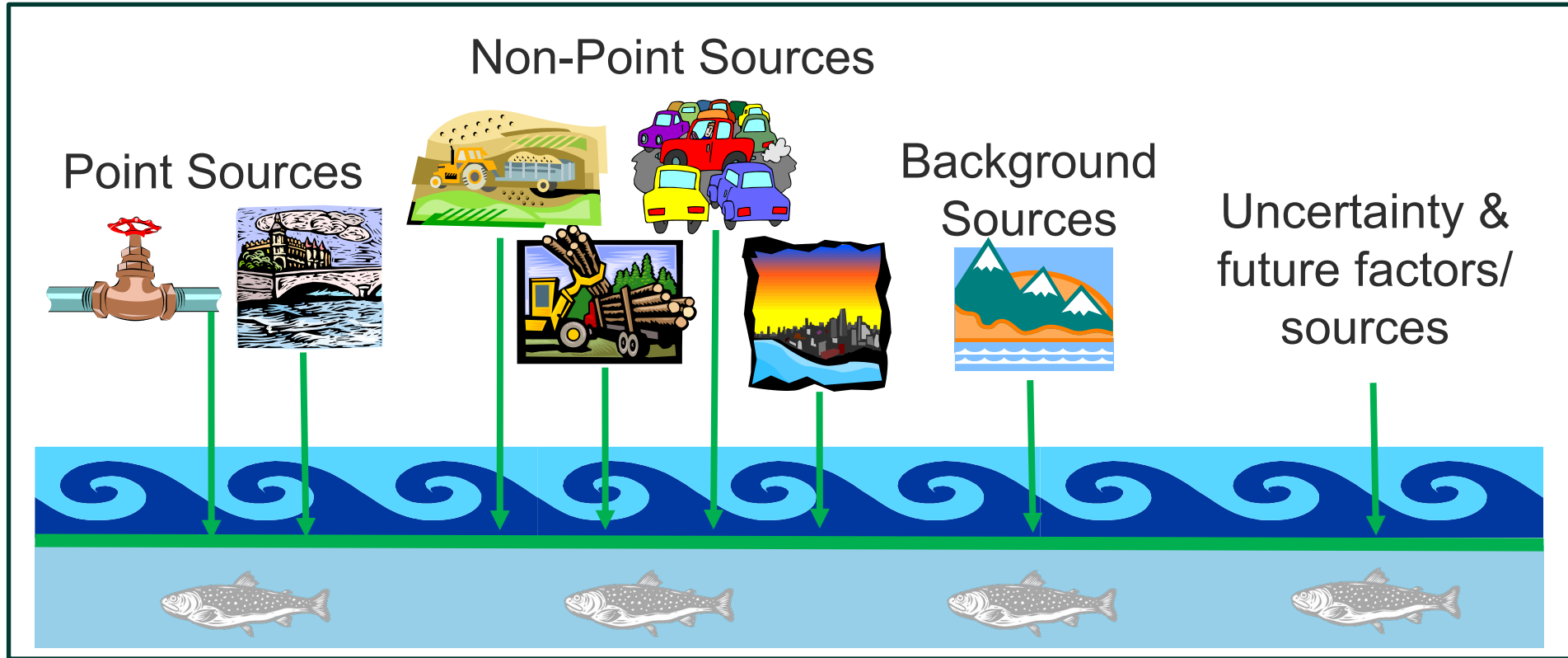
*See TMDL Technical Support Document and Appendices (A-G)

$$\text{TMDL} = \text{WLA}_{\text{ps}} + \text{LA}_{\text{nps}} + \text{LA}_{\text{bg}} + \text{MOS} + \text{RC}$$



Graph not to scale.
For illustrative purposes only.

TMDL source assessment & calculation



$$\text{TMDL} = \text{WLA}_{ps} + \text{LA}_{nps} + \text{LA}_{bg} + \text{MOS} + \text{RC}$$

Wasteload Allocation: Point sources Load Allocation: Non-point sources Load Allocation: Background sources Margin of Safety Reserve Capacity

TMDL elements: sources & allocations in TMDL area

Example: HUA allocations on the Sandy River from City of Troutdale WPCF outfall to the mouth

Sources/Categories	Portion of HUA (°C)	Possible interventions	TMDL section
NPDES PSs: WWTPs (4), Fish Hatchery (1)	0.09*	Engineering solutions	9.1.2
NPS: Warming from tributaries	0.09	Shade restoration	9.1.3
NPS: City of Portland Bull Run dam & reservoir operations	0.00	Engineering solutions	9.1.4.2
NPS: Water management activities & withdrawals	0.05	Reduced withdrawals	9.1.4.5
NPS: Solar loading, existing transportation corridors, buildings, utility infrastructure	0.04	Shade restoration	9
NPS: Solar loading, other sectors	0.00	Shade restoration	9
Reserve capacity (not a true allocation)	0.03	N/A	9
Total	0.30	See above	4.4, 7.7, 9

*Cumulative point source allowance at the point of maximum impact. Individual point sources receive specific allocations (TMDL Table 9-8).

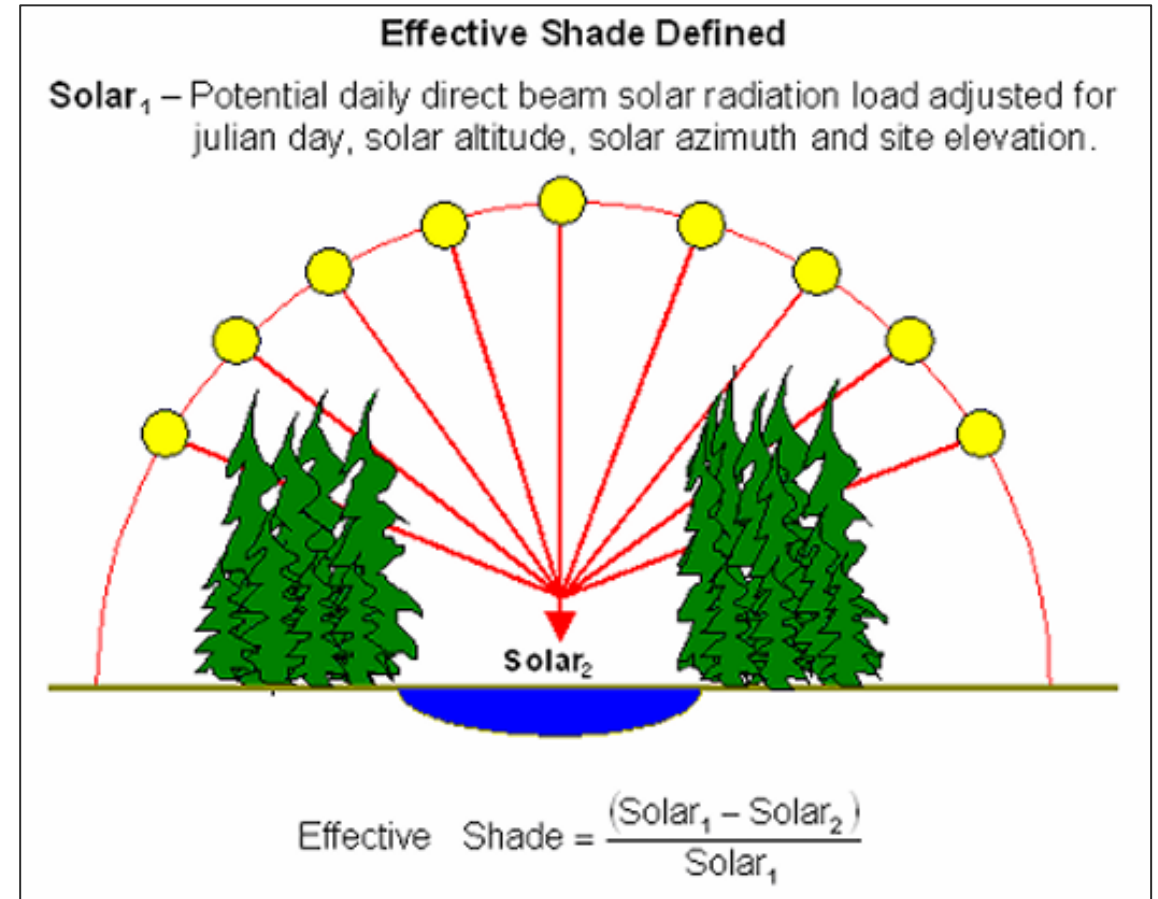
TMDL elements: Surrogate Measures

Surrogate Measures:

- Substitute metrics to represent TMDL pollutants or parameters.

In this TMDL, represent thermal load from:

- Vegetation reduction (Effective shade)
- Dam & reservoir operations (Stream temperature)
- Water management & withdrawals (Percent consumptive uses)



TMDL elements: Surrogate Measures (TMDL section #)

Thermal load sources & their surrogate measures:

- Bull Run Dam & Reservoir operations: Water temperature at reference location (9.1.4.2.1)
- Water management & withdrawals: Consumptive use estimates (9.1.4.5)
- Vegetation reduction: Effective shade, site-specific (9.1.4.3) or general (9.1.4.4)

Example: Site-specific effective shade targets to meet NPS Load Allocations

Designated Mgmt. Agency (DMA)	Stream name	Effective shade (%)			Total stream kilometers assessed
		Current	Target	Gap	
A	Stream Y	74	74	0	50.4
B		54	66	12	12.1
C		69	71	2	10.6
A	Stream Z	32	52	20	5.4
D		22	37	15	3.2
E		50	62	12	2.0

TMDL elements: Reserve Capacity and Margin of Safety

Reserve Capacity (RC), TMDL section 9.1.5:

- DEQ set aside explicit HUA portions for Reserve Capacity (RC) to accommodate:
 - Future provisioning of point or nonpoint source allocations to new or increased thermal loads,
 - Assignment of corrected allocations to existing sources

Margin of Safety (MOS), TMDL section 9.2:

- Can be achieved either *implicitly* or *explicitly*:
- This TMDL uses an implicit MOS
 - DEQ used conservative assumptions throughout the analysis.

$$\text{TMDL} = \text{WLA}_{ps} + \text{LA}_{nps} + \text{LA}_{bg} + \text{MOS} + \text{RC}$$

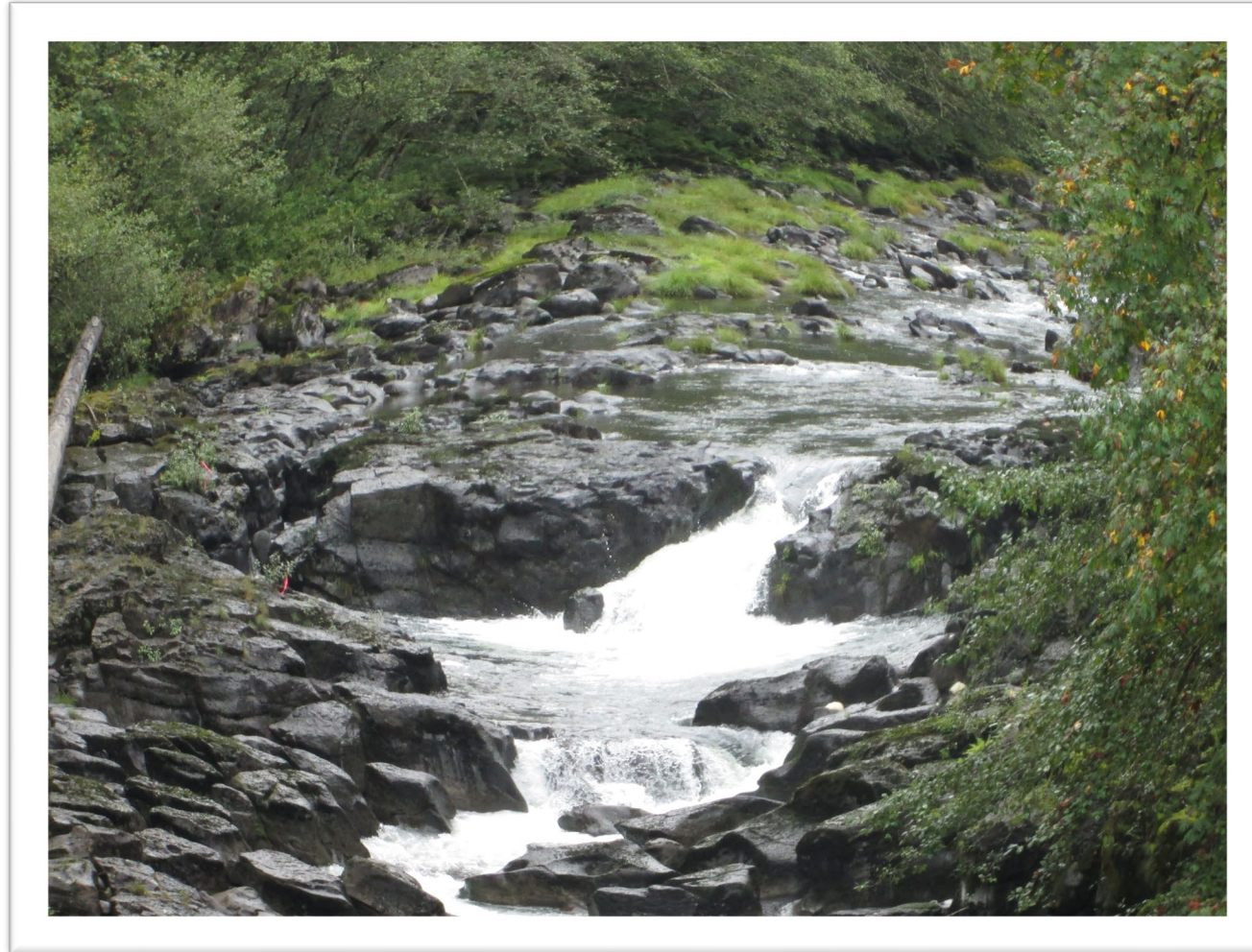
Wasteload Allocation: Point sources Load Allocation: Non-point sources Load Allocation: Background sources Margin of Safety Reserve Capacity

Lower Columbia-Sandy Subbasin TMDL format

- Columbia-Sandy Subbasin Total Maximum Daily Load – adopted, by reference into rule
- Columbia-Sandy Subbasin Water Quality Management Plan – adopted, by reference into rule
- Columbia-Sandy Subbasin TMDL Technical Support Document
 - Appendix A: Model Report
 - Appendix B: Sandy River Temperature Model Configuration and Calibration Report
 - Appendix C: Sandy River Model Scenario Report
 - Appendix D: Bull Run River (USGS 14138850 to confluence with Sandy River) Temperature Model Report
 - Appendix E: Bull Run River Surrogate Measure
 - Appendix F: Climate Change and Stream Temperature in Oregon: A Literature Synthesis
 - Appendix G: Stream Buffer Width Literature Review
 - Appendix H: Assessment Units addressed by Temperature TMDLs for the Lower Columbia-Sandy Subbasin

Rulemaking webpage: <https://www.oregon.gov/deq/rulemaking/Pages/sandytempTMDL.aspx>

Water Quality Management Plan: Lower Columbia-Sandy Subbasin



What is a Water Quality Management Plan?

Oregon Administrative Rule 340-042-0040(4)(I)

- The WQMP is part of the TMDL document - it's the plan of action for implementing the TMDL pollutant allocations
- The WQMP includes specific implementation information:
 - Identifies responsible persons, including Designated Management Agencies, that must implement strategies to meet TMDL allocations through development of a **TMDL Implementation Plan**
 - Proposes management strategies designed to meet the TMDL allocations
 - Describes reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions

Percent estimated acres in project area owned or managed by DMAs

Entity	Type	Approximate percentage of total subbasin area	Approximate percentage of acreage within 150' of streams
US Forest Service	Federal	70.38%	70.11%
Oregon Department of Forestry	State	12.88%	13.62%
US Bureau of Land Management	Federal	4.16%	5.11%
Oregon Department of Agriculture	State	3.81%	2.79%
Clackamas County #	County	2.93%	2.57%
Multnomah County #	County	1.11%	0.88%
City of Portland	City	0.82%	1.04%
Oregon Parks and Recreation Department	State	0.77%	0.65%
Oregon Department of Transportation	State	0.74%	0.40%
City of Gresham #	City	0.78%	0.54%
City of Troutdale #	City	0.50%	0.33%
City of Sandy #	City	0.17%	0.18%
Union Pacific Railroad*	Railroad	0.12%	0.07%
Oregon Department of Fish and Wildlife	State	0.06%	0.11%
Port of Portland*	Special District	0.04%	0.03%
Clackamas Water Environment Services	Special District	-	-
Oregon Department of State Lands*	State	-	-
Department of Geology and Mineral Industries*	State	-	-
Oregon Department of Environmental Quality	State	-	-
Metro*	Special District	-	-

Notes: *Indicates entity is not required to develop a TMDL implementation plan at this time and # Indicates entity was previously identified as a DMA for bacteria in the 2005 Sandy WQMP

TMDL implementation plans

Oregon Administrative Rule [340-042-0080\(4\)\(a\)\(A\)-\(E\)](#)

- Management strategies that the entity will use to achieve load allocations and reduce pollutant loading
- Timeline for strategy implementation and a schedule for completing measurable milestones
- Performance monitoring and a plan for periodic review and revision of implementation plans
- Any other analyses or information specified in the WQMP

What's changed from the 2005 WQMP?

- DMA Updates
- Emphasis still on meeting % effective shade targets (i.e. used as a surrogate measure for temperature load allocations)
 - Recognition that other activities, such as flow, channel, and dam modification also impact stream temperature
- More specific streamside evaluations and reporting required from DMAs
- Required upstream and downstream temperature monitoring for certain dams (dam-specific TMDL plans may also be needed)
- USFS, BLM, ODA, and ODF: Required to complete a streamside shade gap analysis and temperature monitoring as part of a basin wide monitoring strategy

Summary of management strategies

Riparian Strategies

- Streamside tree planting
- Streamside vegetation management/invasive control
- Fencing/Livestock exclusion
- Protect cold water refuges
- Codes/Ordinances

Management strategies

Flow augmentation

- Pursue instream water right transfers
- Promote water conservation strategies
- Repair leaking infrastructure

Channel restoration

- Whole channel restoration projects
- Increase floodplain interactions
- Dam management strategies

Bacteria – no changes from 2005 WQMP

- Stormwater management practices
- Bacteria source tracking
- Manage pet waste
- Implement best management practices for livestock manure and pasture management
- Reduce livestock access to streams
- Assess risk of failure of onsite septic systems and connect to public sanitary sewer systems where possible

DEQ Shade Gap analysis

- Shade gap - percent difference between current effective shade and site potential effective shade (restored condition)
- Where available, DMAs must use DEQ analysis to inform their streamside evaluations



Streamside Shade Gap analysis requirement

- DMAs that have a DEQ shade gap analysis may choose to perform their own assessment, instead of using DEQ's, to determine whether effective shade allocations are being met
- ODA, ODF, BLM and USFS must perform an assessment to determine whether effective shade allocations are being met for those areas where DEQ did not complete a shade gap analysis
- Effective shade assessments must use location specific methods

Streamside evaluation

- Responsible persons and DMAs that are required to submit an implementation plan must complete a streamside evaluation
 - Goal is to review current conditions to support development of implementation measurable objectives and milestones
 - Must use DEQ's shade gap analysis, where available, in the streamside evaluation
- The streamside evaluation will be included in implementation plans and utilized during the five-year review
 - To assess progress in meeting implementation timelines, milestones, and measurable goals

Streamside evaluation components

- Quantify
 - Streamside area that needs enhancement
 - Streamside area that may not need action beyond protection
 - Streamside area where **physical constraints** exist that preclude implementation of vegetation management strategies
 - Streamside area where **jurisdictional constraints** exist that limit implementation of vegetation management strategies
- Report opportunities that may exist to address constraints
- Report areas where there is potential to implement BMPs such as in-stream restoration, flow augmentation projects, experimental temperature management techniques, or enhancement and protection of cold water refuges
- Evaluate data from the above items to prioritize implementation actions



120 foot Buffer Alternative

- Potential shade loss associated with a 120' riparian buffer will not cause stream temperature increases for most water bodies (TSD Appendix G)
- Option to establish and protect overstory woody vegetation within a 120' slope width buffer zone from the stream bank through development of enforceable ordinances or regulations
 - May select 120' foot buffer alternative instead of completing shade gap analysis
 - Still required to complete streamside evaluation

Stream Temperature and Consumptive Use surrogate measures

- Dam/reservoir surrogate measure – stream temperature
 - No additional warming between dam inflow and outflow
 - Collect data to characterize inflow and outflow temperatures, stratification timing, and water level fluctuations and outflow rates
 - Adaptive management
 - Possible implementation plan development
- Water management surrogate measure - percent consumptive use
 - Percent of natural surface flow that does not return to surface water after it has been withdrawn for a water use activity
 - As modeled at USGS gage 14142500, the TMDL indicates that a consumptive use flow rate reduction of 1.90% will maintain the HUA associated with water withdrawal activities
 - DEQ anticipates using the consumptive use surrogate measure when reviewing new applications for water rights in the Lower Columbia-Sandy Subbasin

Submittal timelines

Requirement	Due date / timeframe
TMDL implementation plan	Due 18 months after EQC adoption of Willamette Mainstem TMDL*
Streamside evaluation (Sec. 5.3.2)	Due 18 months after EQC adoption of Willamette Mainstem TMDL
Project plan and description of the assessment methodology to be used to complete a shade gap analysis (Sec. 5.3.4)	Due 18 months after EQC adoption of Willamette Mainstem TMDL
Streamside shade gap analysis (Sec. 5.3.4) and updated streamside evaluation or 120 ft. streamside buffer that establishes and protects overstory, woody vegetation (sec. 5.3.3)	Four years after implementation plan submission deadline
Reservoir operators named in Table 7 (Sec. 5.3.6)	Submit a Quality Assurance Project Plan for temperature monitoring for each reservoir 18 months after EQC adoption of Willamette Mainstem TMDL. Following the temperature assessment, the DMA will consult with DEQ on a timeframe for submitting a cumulative effects analysis, or TMDL implementation plan as needed.

*The Willamette Mainstem TMDL is a separate temperature TMDL to be developed and approved following the Lower Columbia-Sandy Subbasin TMDL.

Reporting requirements

- OWRI reporting of BMPs
 - Upon completion, projects utilizing practices listed in OWEB's OWRI Online List of Treatments must be reported to the OWRI database
 - OWRI database is used to track implementation activities
 - Other acceptable databases will be identified when developing implementation plans
- Annual reporting
 - Tracking of management strategy implementation
 - Progress towards timelines and measurable milestones specified in the implementation plan
 - Evaluation of the effectiveness of the management strategies
- Year 5 reporting
 - Must summarize implementation and effectiveness over the preceding four years
 - Revised to reflect updated implementation timelines

Sandy Basin Temperature Monitoring Strategy

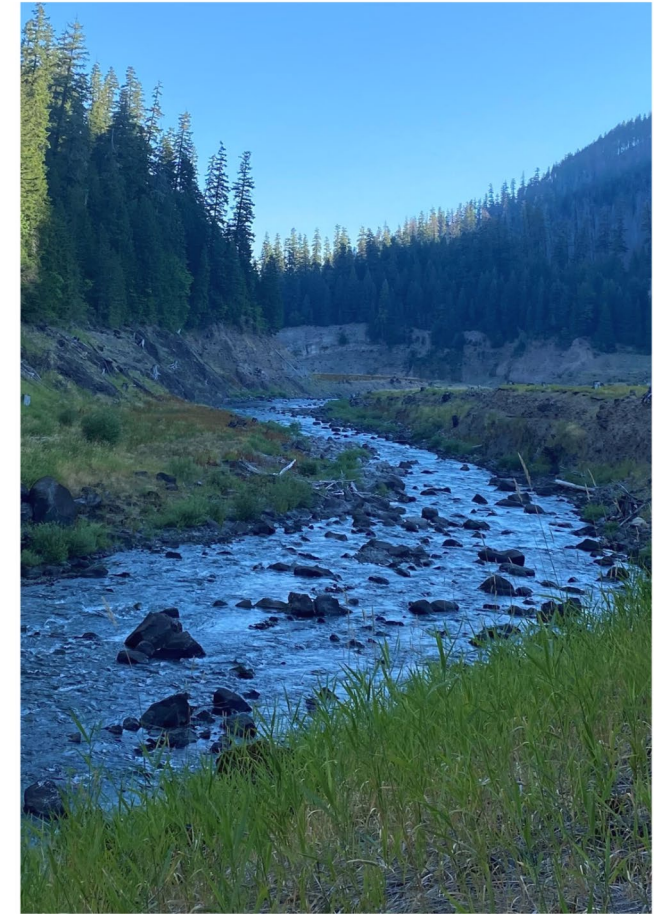
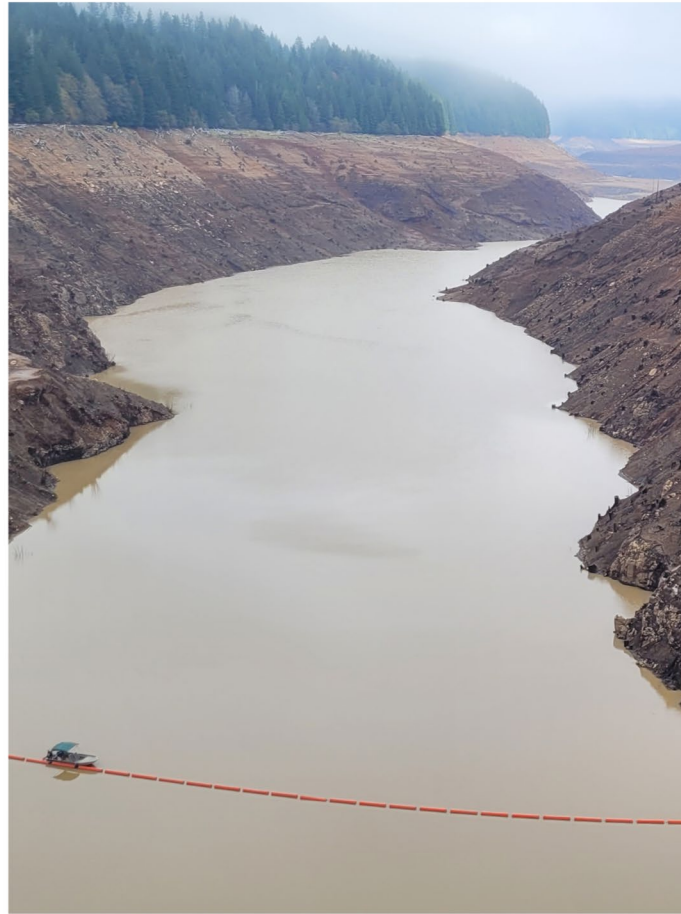
- DEQ, working with partners, will develop a water column sampling and analysis plan
 - Finalized after issuance of Willamette Mainstem Temperature TMDL
 - Strategy will be revised as needed
 - USFS, BLM, ODA, and ODF will be required to conduct water quality monitoring
 - Jurisdiction over more than 90% of streamside areas in the TMDL project area
 - QAPPs to be developed under the monitoring strategy

Fiscal impact analysis

Oregon Revised Statute (ORS Chapter 183)

- Public notice must include a Statement of Fiscal Impact
- DEQ must solicit input from a rule advisory committee on:
 - Whether the rule has fiscal impact
 - The extent of that impact
 - Whether the rule will have a significant adverse impact on small businesses
- Racial equity statement ORS 183.335(2)(b)(F)
https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
- Environmental justice consideration ORS 182.545
https://www.oregonlegislature.gov/bills_laws/ors/ors182.html
- Land use compatibility statement

Questions



Public hearing for the Lower Columbia-Sandy Subbasin

To make a formal comment, please let us know by raising your virtual hand or adding your name and email to the chat.

When commenting provide your name, affiliation, and email address.

Web pages (links to rulemaking pages, Quality Assurance Project Plans, more)

- **Project page:** <https://www.oregon.gov/deq/wq/tmdls/Pages/tmdlRlc-sandy.aspx>
- **Rulemaking webpage:** <https://www.oregon.gov/deq/rulemaking/Pages/sandytempTMDL.aspx>
- **Rulemaking email:** Sandy.SubbasinTMDL@DEQ.oregon.gov



Contacts and resources

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Michele Martin, Project Manager Michele.martin@deq.oregon.gov

Web pages (links to rulemaking pages, Quality Assurance Project Plans, more)

Project page: <https://www.oregon.gov/deq/wq/tmdls/Pages/tmdlRlc-sandy.aspx>

Rulemaking webpage:

<https://www.oregon.gov/deq/rulemaking/Pages/sandytempTMDL.aspx>

Rulemaking email: Sandy.SubbasinTMDL@DEQ.oregon.gov

Title VI and alternative formats

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