Willamette Basin Mercury TMDL Implementation Plan 2024-2028

Oregon Department of Agriculture

Date: July 25, 2023
DMA Name: Oregon Department of Agriculture
Subbasin(s): 17090001, 17090002, 17090003, 17090004, 17090005, 17090006, 17090007, 17090008, 17090009, 17090010, 17090011, 17090012, Multnomah Channel, Columbia Slough
Receiving Waterbodies: All perennial and intermittent streams in the Willamette Basin (HUC 170900)
Applicable TMDLs to your jurisdiction: Willamette Mercury TMDL
County(s): Columbia, Multnomah, Clackamas, Washington, Yamhill, Marion, Polk, Linn, Benton, Lane

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Introduction

The U.S. Environmental Protection Agency (EPA) is responsible for implementing the Clean Water Act (CWA) in the United States. The EPA delegated authority to DEQ to implement the federal CWA in Oregon. The Department of Environmental Quality (DEQ) is the lead state agency with overall authority to implement the CWA in Oregon. DEQ works with other state agencies, including Oregon Department of Agriculture (ODA) and the Oregon Department of Forestry to meet the requirements of the CWA. DEQ sets water quality standards that are protective of beneficial uses and develops Total Maximum Daily Loads (TMDLs) for impaired waterbodies, which ultimately are approved or disapproved by the US EPA. The Willamette Basin Mercury TMDL was developed in cooperation between DEQ and EPA. The Environmental Quality Commission (EQC) serves as DEQ's policy and rulemaking board.

A TMDL includes an assessment of conditions (based on water quality data, land condition data, and/or computer modeling) and describes a plan to achieve water quality standards. Beneficial uses describe the activities that a water body supports. Water quality standards are established to protect the most sensitive beneficial uses of the state's waters. TMDLs specify the daily amount of pollution a waterbody can receive and still meet water quality standards. In this case, the pollutant is methylmercury and total mercury, which is generally deposited to all ground via atmospheric deposition, then transferred to waterbodies via soil erosion. The designated beneficial uses of this TMDL are human health, fish and aquatic life, wildlife, hunting, and fishing (fish consumption).

The total loading capacity of mercury in the watershed is 43.36 grams/day. The estimated actual load exceeds that by 318 grams/day. The water column mercury target is 0.14ng/l, current levels in the Willamette Basin are approximately 1.2ng/l. Reducing mercury to recommended safe levels require a reduction in mercury loading by 88-96% depending on the location/existing level. All data can be found in DEQ Willamette Basin TMDL and supporting documents, links can be found in Appendix A.

The average level of mercury in bass and northern pikeminnow was found to be 0.63 mg/kg, whereas the approximate 'safe' level is 0.35 mg/kg for fish consumption advisories. This is a median recommendation of the Oregon Health Authority's (OHA) current screening values of 0.2 mg/kg for vulnerable populations to 0.6 mg/kg for the general population.

Most of the mercury (96%) is coming from nonpoint sources, which includes forest (51%), grassland (17%), shrubland (12%), agriculture (8%), developed (8%), and other minor sources.

The Oregon Department of Agriculture (ODA) is the designated management agency (DMA) to implement TMDLs for agriculture in Oregon. A requirement for ODA is to develop and implement this five-year Willamette Mercury Implementation Plan beginning in 2024 followed by annual reporting and adaptive management to achieve the necessary mercury reductions.

Since mercury contamination is derived mainly from sediment erosion, total suspended solids (TSS) is the surrogate to measure progress in reducing mercury inputs.

Successful implementation of this plan will require both voluntary and regulatory water quality management strategies and programs, which are outlined in this plan.

To minimize increased regulation and oversight, the agricultural community must show progress toward meeting TMDL implementation goals to achieve and maintain water quality standards. This plan addresses the broad processes and discussions required to obtain the data, funding, and presentation methods ODA needs to show agricultural water quality progress being made.

ODA does not have the funding and staff to fully implement all the tasks listed. The qualifications are noted within each water quality management strategy. Where ODA lacks the funding to complete tasks, funding requests will be made within ODA, in some cases in partnership with other agencies, to obtain the required funding; also, by pursuing external federal grants where available.

Geographic Information

The Willamette Mercury TMDL applies to all perennial and intermittent streams in the Willamette basin (HUC 170900). This includes 12 Willamette subbasins (HUC8), 10 ODA Agricultural Management Areas, and eight counties, as outlined in Tables 1 and 2, and Figure 1.

Agricultural Water Quality Management Areas (MA) are ODA's primary planning and reporting areas for inputs, outputs, and outcomes. Most Willamette MAs do not align with HUC-8s.

Table 1. Management Areas and Soil and Water Conservation Districts

Management Areas	***Soil and Water Conservation Districts***
Lower Willamette	West Multnomah
Clackamas Subbasin	Clackamas (part)
Tualatin River Watershed	Tualatin
Yamhill	Yamhill, Polk
Mollalla/Pudding/French Prairie/North Santiam	Marion
Middle Willamette	Benton (part)
Upper Willamette andUpper Siuslaw	Upper Willamette (part)
Southern Willamette Valley	East Multnomah (part)
South Santiam	Linn
North Coast Basin (Multnomah Channel HUC10)	Columbia (part)

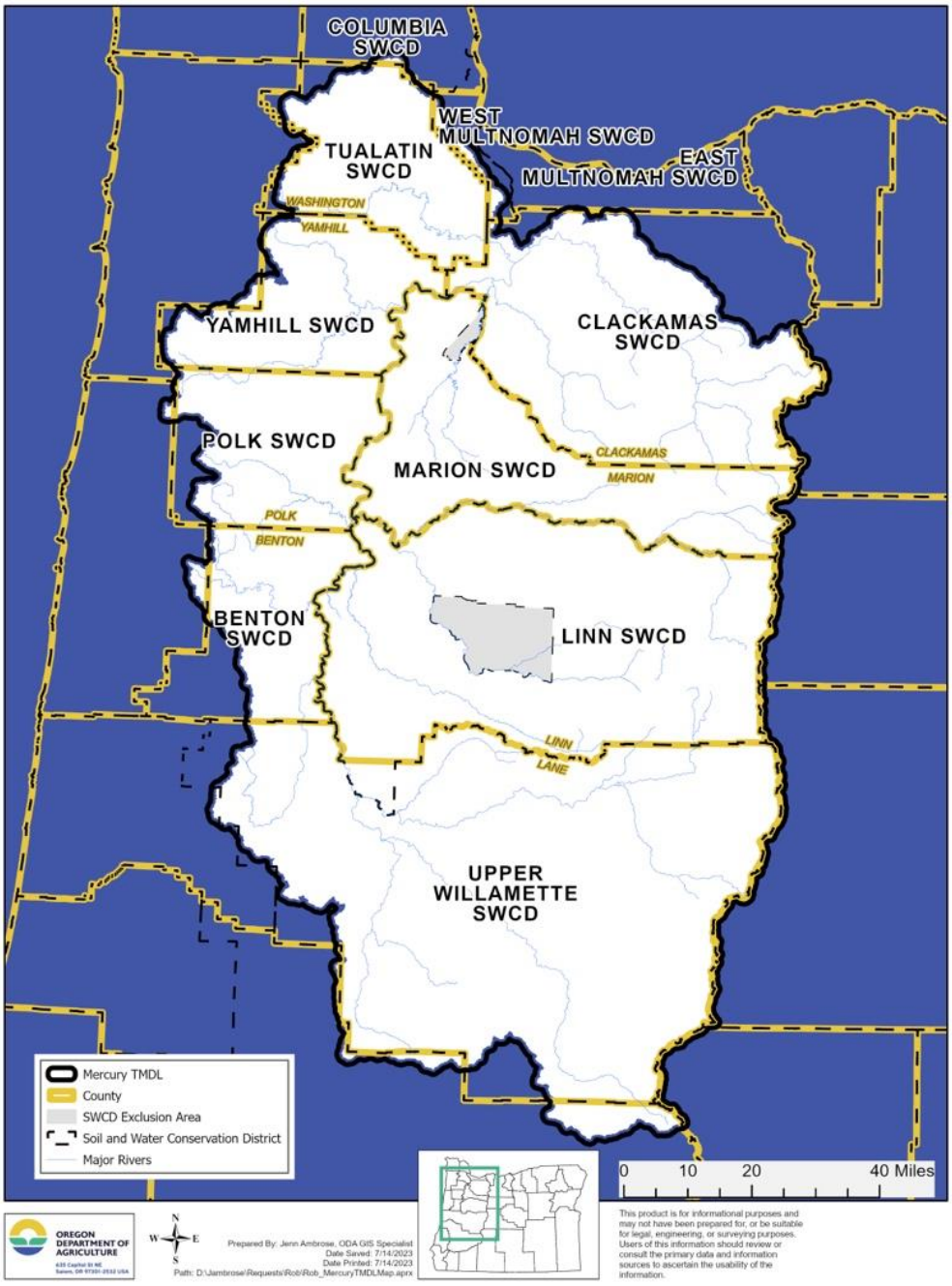
*Most MAs do not align with HUC-8s.

Table 2. Subbasins (HUC8) within the TMDL Area

Subbbasin - HUC8	***Subbasin Name***
17090001	Middle Fork Willamette
17090002	Coast Fork Willamette

17090003	Upper Willamette
17090004	McKenzie
17090005	North Santiam
17090006	South Santiam
17090007	Middle Willamette
17090008	Yamhill
17090009	Mollalla-Pudding
17090010	Tualatin
17090011	Clackamas
17090012	Lower Willamette
	Multnomah Channel
	Columbia Slough

The Willamette Mercury TMDL Area and SWCD Regions



Waterbodies and TMDL Pollutants

Water quality standards are adopted to protect the beneficial uses of waters of the state. Beneficial uses within the Willamette Basin Mercury TMDL include human health, fishing, drinking water, resident and anadromous fish, and aquatic life. Specific regions are listed for different beneficial uses and can be found in the Oregon Department of Environmental Quality Final Revised Willamette Basis Mercury TMDL.

Mercury is deposited directly from the atmosphere on all lands and water and does not originally derive from agricultural activities. However, the mercury pollution is derived primarily (95%) from nonpoint source pollution, and the top two causes are 1) soil erosion (43%) and 2) surface water runoff (33%).

Table 3. Sources of Willamette Mercury Pollution

Nonpoint Source	**% Pollution Contribution**
Erosion of mercury containing soils	43
Surface runoff of mercury	33
Resurfacing groundwater	17
Direct deposit to open water	2
Urban	<1
Legacy mineral discharges	1
Point Sources	
Permitted stormwater	3
Sewage treatment plants	<1
Industrial discharges	<1
Total	**100**

The amount of mercury in a waterbody is estimated using the quantity of methylmercury bioaccumulated in fish (pikeminnow) tissue. A bioaccumulated concentration of 0.04 milligrams/kilogram of fish tissue is the current water quality standard for Oregon. This corresponds to a Total Mercury TMDL Water Column Target concentration of 0.14 ng/L. This is the preferred surrogate measurement for mercury in the water column because it accumulates in measurable quantities in fish tissue first.

On average, DEQ estimates that the total mercury polluting the Willamette Basin is 361 g/day, and the allowable capacity to achieve water quality standards is 43 g/day. That is 318 g/day of excess load polluting our waters.

Nonpoint source's share of the TMDL Mercury pollutant is 342 g/day, which needs to reduce to 30 g/day to achieve water quality standards, meaning about an 88% reduction in mercury deposition.

There are varying mercury concentrations throughout the watershed. The following table shows the areas (subbasin or waterbody) and name, the median mercury concentration (ng/l), and the required percent reduction in mercury to meet the water quality standard. All waterbodies within the Subbasins have a goal to reduce mercury by a specific percent reduction. The last two columns show what the current mercury load is in gallons per day, and the mercury load capacity in gallons per day. In essence, the last two columns show the current watershed pollutant concentration and the desired pollutant concentration.

Table 4. Subbasin/Waterbody Mercury Reduction Goals

	NOW	GOAL	NOW	GOAL
Area/Waterbody	**Median Mercury Concentration (ng/l)**	**Required % Reduction**	**Mercury Load (g/day)**	**Mercury Capacity (g/day)**
Middle Fork Willamette	0.86	88%	23.47	2.61
Coast Fork Willamette	3.39	96%	24.39	0.94
Upper Willamette	1.01	88%	71.62	4.72
McKenzie	1.00	88%	34.81	3.70
North Santiam	0.92	88%	21.57	2.20
South Santiam	1.20	88%	38.24	3.50
Middle Willamette	1.23	89%	17.32	1.93
Yamhill	1.13	88%	35.50	3.22
Mollalla-Pudding	0.88	88%	30.70	2.91
Tualatin	1.32	89%	22.93	1.91
Clackamas	1.00	88%	23.63	2.58
Lower Willamette	1.23	89%	6.02	0.68
Multnomah Channel	1.23	89%	7.68	0.70
Columbia Slough	1.23	89%	2.71	0.29
Total			**360.58**	**31.89**

Because mercury deposition can't be measured directly, an alternative (surrogate) method to measure is Total Suspended Solids (TSS) within the water bodies. A reduction in TSS achieved through landscape management practices will result in a reduction of mercury pollution in waterbodies.

Table 5. Scheduled TSS Reductions and Targets

Years from Start	TSS reduction	Cumulative Total Reduction TSS (mg/L)	Target Maximum Instream TSS (mg/L)
0	0%	0	17
5	10%	1.7	15
10	25%	4.3	13
20	50%	8.5	9
30	75%	12.7	4

Mercury Pollutant – Source and On-farm Management

Agricultural sources of sedimentation, and therefore mercury pollution, are primarily caused by a lack of riparian vegetation, lack of vegetation on crop fields/cover crops especially in winter, livestock overgrazing, and farm roads. Management practices outlined in Table 6 may reduce sedimentation from entering the stream.

Table 6. On-Farm Management Practices to Reduce Mercury Pollution/Sedimentation

Problem	Practice	Resource Concerns Addressed	Potential Benefits to Landowner	Potential Costs to Landowner
Livestock grazing limiting riparian vegetation growth	Rotational grazing in riparian area; timed when growth is palatable to animals and when riparian area soils are not saturated	May help establish desirable riparian, promotes streambank integrity, reduce stream temperatures by providing shade.	May lessen streambank erosion and loss of pastures; Improves wildlife habitat and may control weeds. Practice may be eligible for cost-sharing.	Requires intense management to ensure that site capable vegetation is maintained with use of livestock grazing. Practice may be eligible for cost-sharing.
	Livestock exclusion from riparian area; establishing off-stream watering facilities	Helps promote desirable riparian vegetation; promotes streambank integrity; helps filter nutrients and sediment from runoff; may help narrow channel and reduce erosion in channel	May lessen streambank erosion and loss of pastures; less time involved in managing livestock grazing in riparian area, improves wildlife habitat, ensures compliance with AgWQ Area Rules.	Loss of grazing area; may require higher weed control costs in riparian areas. May require financial investment for livestock control and off-stream watering facilities.
Lack of proper vegetation for filtering and stopping erosion/runoff	Planting perennial vegetation in riparian areas; establish vegetated riparian buffers and filter strips; invasive plants control	Helps establish perennial riparian vegetation rapidly; promotes streambank integrity; may help narrow channel and reduce erosion in channel; provides appropriate shade necessary to moderate solar heating	May lessen streambank erosion and loss of pastures. If livestock are excluded from riparian area, area may be eligible for federal cost-share programs. Some alternative perennial agricultural products may be harvested from riparian areas.	Costs of vegetation and weed control. May require financial investment for riparian fencing and off-stream watering facilities while vegetation establishes.
	Grazing management: graze pasture plants to appropriate heights, rotate animals between	Helps prevent sediment, nutrient, mercury and bacteria runoff into	May improve pasture production; easy access to water may increase livestock production as	Cost of installing fencing, watering facilities for rotational grazing system; time involved in

	several pastures; provide limited access or off-stream access to water in each pasture.	waters of the state. Helps protect streamside areas.	well. May improve livestock health because of better nutrition and parasite control. May improve composition of pasture plants and help prevent weed problems.	moving animals through pastures.
	Install sediment catch basins and facilities	Traps sediment prior to reaching waters	May help prevent ditch bank erosion, slumping and stream meandering.	Initial cost and maintenance involved with keeping the catch basins clear for use; permits may be required
Farm Road Runoff	Farm road construction: construct fords appropriately, install water bars or rolling dips to divert runoff to roadside ditches. Maintain a vegetative buffer between farm road and surface water.	Helps prevent sediment and mercury runoff to waters of the state.	May help prevent water damage on farm roads. Practice may be eligible for cost-sharing programs.	Cost of installation and maintenance.
Drainage ditch runoff	Plant appropriate vegetation along drainage ditches; seed ditches following construction	Helps prevent sediment and mercury runoff into waters of the state.	May help prevent ditch bank erosion and slumping.	Costs of establishing vegetation.
Bare ground	Plant cover crops on erosion-sensitive areas.	Helps prevent sediment and mercury runoff into waters of the state; helps filter nutrients and slow runoff	May reduce weed problems; prevents loss of applied nutrients.	Costs of establishing cover crops; cover crops may compromise primary crop
Over Irrigation	Irrigate pasture or crops according to soil moisture and plant water needs.	Helps prevent irrigation return flow and associated nutrients, sediment, and mercury to waters of the state.	May reduce costs of irrigation; may help crop or pasture production.	Installation/ maintenance cost. Monitoring time
Water Ponding	Install/maintain diversions or French drains to prevent unwanted drainage into barnyards and animal heavy use areas.	Helps prevent nutrient and mercury runoff into waters of the state.	Decreases muddiness and shortens saturation period in protected areas.	Cost of installation. Practice may be eligible for cost-sharing programs.

ODA Erosion Control Strategies for Mercury Reductions

The ODA has identified and evaluated 18 strategies to reduce mercury in the Willamette Basin. The strategies described in this section are broken up into three categories:

1) Communications and Focused Activities
2) Compliance
3) Monitoring

The underlying ODA Implementation Matrix is shown in Appendix B) ODA Willamette Mercury TMDL Implementation Matrix.

Communications and Focused Activities

Strategy 1) Engage Partners to Discuss ODA Approach to Mercury TMDL

Share the background, data, environmental need, and the associated TMDL Rule and Measurable Goals with ODA Partners. These partners include, but are not limited to, the

Oregon Association of Conservation Districts, Soil and Water Conservation Commission, Oregon Farm Bureau, Landowner Advisory Council's, Soil and Water Conservation Districts, Oregon Wheat League, Oregon Cattlemen's Association, Oregon Nursery Association, Pacific Northwest Christmas Tree Association, and other interested parties.

ODA plans to share a minimum of 10 presentations per year entirely on the Willamette Mercury TMDL.

The goal of the presentations is to share the history, progress, and implementation of the Willamette Mercury TMDL, develop and gather input from partners on agricultural measurable objectives and to further refine ODA's implementation path. This will be an ongoing process in which ODA will track the number of presentations and participants in attendance to measure progress with this strategy.

A longer-term goal is to have a partner Web Portal HUB that communicates TMDL background, data, environmental need, and associated TMDL Rules and Measurable Goals.

Strategy 2) Public Messaging

Ultimately, success will come from a combination of voluntary and compliance efforts on the ground. Sediment inputs to streams is a widespread problem; the public will be informed and know about how the TMDL Implementation Plan will reduce sediment input into waters of the state.

ODA's goals and TMDL benchmarks can be partially achieved through public education on the Willamette Basin Mercury TMDL. ODA water quality program will utilize ODA public relations staff to strategize a public messaging campaign. ODA, under current staffing, will develop a public information sheet for sharing through social media, the SWCD network of the 10 affected Management Areas, and other outreach platforms. If staffing has time available, a targeted community survey will periodically be performed to assess effectiveness, which will also lead to public education.

Public messaging will include the following messages:

1) Sediment is a pollutant.
2) Soil is to be kept in place.
3) Brown water after a rain event is not normal or acceptable.

To take the public messaging broadly within the area, ODA will partner with other agencies to have a combined marketing approach. ODA will evaluate whether hiring a public relations specialist for this and future TMDL's is necessary to share our agricultural water quality issues. Full implementation of this task relies on additional resources.

A longer-term goal is to have a public Web Portal HUB that communicates TMDL background, data, environmental need, and associated TMDL Rules and Measurable Goals.

Strategy 3) Agricultural Water Quality Area Plan updates and measurable objectives

All 10 Management Areas have an Agricultural Water Quality Management Area Plan (Area Plan) that is updated entirely every sixth year (3 biennium's). Every second year (biennium) accomplishments, progress, and impediments are assessed, as well as considering if modification to implementation strategies are needed to further progress toward goals outlined in the Area Plan. These updates and reviews are done through conversations with a Local Advisory Committee (LAC), ODA, DEQ, NRCS, WCs and the local SWCDs.

Following approval of the ODA Willamette Basin Mercury TMDL I-plan, ODA will update the respective Area Plans is to show progress and implementation toward meeting water quality standards. This can be measured by the number of affected Area Plans that have the updated Willamette Mercury TMDL section included in the plan.

An area-wide assessment will be conducted by ODA to determine the pertinent available ambient TSS monitoring locations for each Management Area. After the Willamette Mercury TMDL assessment, specific ambient TSS monitoring locations will be added to the Area Plans.

An additional step will be to include measurable objectives (MO) within the Area Plan as a specific target for the Management Area. The MO's may be based on specific TSS targets at locations, vegetation assessment outcomes, reduction in strategic bare ground through winter, adoption of cover crops, etc.

The goal of ODA is to have Willamette Mercury TMDL Measurable Objectives in 100% of all affected Water Quality Management Plans, or 'noted' for submission in the next Plan Full Review by 2029.

Area Plans are generally updated every sixth year. However, at each biennial review, progress towards TMDL MOs will be assessed, any impediments identified and if adaptation to strategies is needed. A summary of the discussion and recommendations will be provided in a report to the Board of Agriculture and the Area Plan will be updated in the next full review.

To minimize increased regulation and oversight, the agricultural community must show progress toward meeting TMDL implementation goals to achieve and maintain water quality standards.

Streamlining the agricultural data flow and data presentation associated with Area Plans to show restoration efforts, data, and MO's will be discussed with the Soil and Water Conservation Commission, Oregon Farm Bureau, LACs, SWCDs, and all partners. This Rule comes with a requirement for DMAs to track, manage and annually report on TMDL implementations and status. The timing of this data streamlining will depend on staffing and prioritization of ODA program processes.

Separation of Area Plan static text into a web story map, and data, goals, and progress into a map-focused web application would allow online publication of routine data and progress separately from the more static text of the Area Plan. Both could be communicated within one Experience Builder Application.

Strategy 4) Landowner Engagement- ODA Scope of Work and Strategic Implementation Area

The Soil and Water Conservation Districts, through the Agricultural Water Quality Scope of Work (SOW), engage landowners in voluntary agricultural improvements and management practices that are protective of water quality. Additionally, through the SOW, SWCDs, provide technical assistance and seek funding for implementing agricultural water quality practices. Due to the Willamette Mercury TMDL, ODA will emphasize that sediment reduction engagements be prioritized within the SOW. Progress toward meeting the Mercury TMDL will be tracked by using the SOW inputs and outputs, including number of events, landowners present, technical assistance, site visits, funding proposals, and conservation plans written. It will be imperative that this data be available and visible to monitor progress.

Strategic implementation Areas (SIAs) are a tool to improve water quality utilizing watershed assessments, landowner communication and compliance activities. The scale and scope of the Willamette Mercury TMDL is larger than the intent of an SIA, however, the SIA methodology can be utilized in a focused area for TMDL related progress. This progress would be captured in SIA reporting mechanisms. Discussions regarding the scale and scope of the SIA surrounding a TMDL will be addressed, such that the SIA continues to be a useful tool throughout the State.

ODA's data collection from SOWs and SIAs are undergoing a process to be automated such that the inputs and outputs are easily and remotely entered directly by partners, available as collected, and feeds into ODA's reporting structures. The timing of this effort will depend on prioritization and resources available.

The original scope and framework of the SIA's intended purpose and operation do not match with satisfying the TMDL requirements. An effort to modify the SIA for broader purposes is addressed in Strategy 8) EPA Restoration Grant SIA Focus. More permanent funding for a modified SIA that incorporates TMDL's is described in the Fiscal Analysis with staffing and implementation money gaps.

Strategy 5) Practices Implemented- ODA Scope of Work and Strategic Implementation Areas

The SWCDs, through the SOW and the SIA engage landowners in implementing on-the-ground practices. Due to the Willamette Mercury TMDL, ODA will emphasize that sediment reduction practices be prioritized within these programs.

ODA's goal is to make the local efforts (inputs) and practices implemented (outputs) visible to the local agencies, such that individual goals and strategies can be developed.

Progress with Strategy 5 will come directly from SOW and SIA reporting and will be categorized by sedimentation practices. These practice groups will include activities such as irrigation water management, fencing, tree/shrub establishment, cover crops, and heavy use area protection. Also included are riparian activities such as tree/shrub establishment, fencing, and off-channel livestock watering.

Standardization toward Natural Resources Conservation Service (NRCS) practice codes as equivalence to agricultural water quality practices will continue, and the importance of getting best management practices (BMPs) documented. This documentation can be through NRCS, Conservation Reserve Enhancement Program (CREP), SOW, SIA, or Oregon Watershed Restoration Inventory (OWRI). ODA is exploring the addition of a voluntary restoration activity reporting mechanism such that restoration projects can be tracked.

ODA's data collection from SOWs and SIAs are undergoing a process to be automated such that the data is easily and remotely entered directly by partners, available as collected, and fed into ODA's reporting structures. Future efforts will allow Structured Query Language (SQL)and GIS story map's to be developed around upland activities (irrigation, fence, woody planting, cover planning, heavy use area) and riparian activities (woody planting, fencing livestock watering).

Strategy 6) Practices Implemented- ODA Agricultural Drainage Channel Maintenance (ADCM)

ODA issues five-year Notices of Work for Agricultural landowners to maintain natural channels if they are historically maintained, dry, and not essential salmonoid habitat; this is with no fee. This is an agricultural exception to the Department of State Lands (DSL) permit, which does require a fee.

A requirement of the Notice is to maintain large woody debris, as well as reseeding of channel bed, banks, and bare ground from maintenance activities and spoils placement to stabilize soil and create a riparian buffer.

This is a new program which has implemented 16 miles of Notices within the Willamette Mercury TMDL region since 2019.

Continued outreach is the primary goal with the ADCM program, as this is a new program. The program's efforts are continually measured and monitored.

ODA's goal is to increase the utilization of the ADCM program each year.

Strategy 7) Practices Implemented – NRCS, FSA and OWRI

Monitoring the progress within the agricultural areas will require documenting the practices implemented which are external to ODA such as NRCS implementations, CREP, and State or voluntarily recorded efforts through OWRI. To understand and monitor the larger picture of

agricultural efforts and results, we need to report on all agricultural improvements and practices that prevent and control sedimentation into surface waters.

The data will come through appropriate data agreements and be filtered by practices that effect sedimentation. Progress will be monitored via the number and type of restorations reported.

This Strategy is only achievable if the agencies are willing to provide the data.

Strategy 8) EPA Columbia Basin Toxics Restoration Grant Enhanced SIA

Contingent on funding received for the EPA Restoration Grant, a modified approach to three (3) SIAs within the Willamette Mercury TMDL boundaries will be chosen. Appendix C contains an abstract of ODA's EPA Grant submission. The core difference from existing SIA's include:

1. Watershed assessments at the beginning, middle and end of the SIA (5-7 years).
2. ODA/OSU Extension documentation, adoption and publication of sediment reducing BMPs.
3. ODA, OSU Extension, and local team develop SIA/watershed goals with a broad targeted team strategy session with local agencies, nongovernmental organizations (NGOs) and interested parties.
4. Local publicity around the SIA's goals and associated BMPs
5. Implementation funding available for SIA restoration work, and a longer time to allow the work to be funded and accomplished.
6. A visible data-sharing portal to share monitoring and/or assessment data. This could include:
    a. HUB to store documentation, adoption (web map for reporting), and publication of sediment reducing BMPs.
    b. Within HUB, communicate SIA/watershed goals for targeted local agencies, NGOs, and interested parties.
    c. Local publicity around the SIA/watershed goals and associated BMPs.
    d. Listing of available watershed restoration funding resources.
    e. Data-sharing portal to share monitoring and/or assessment data.
7. A final presentation for the community to share progress, accomplishments, and impediments.

The progress of these SIA's will come directly from the SIAs themselves. The three SIA's will begin within two years after receipt of funding. The first year after receipt of funding will be utilized for BMP development, coordination, and preparation.

ODA's goal is to use the EPA Restoration Grant methods as a prototype or pilot for other upcoming TMDL focused SIA's

The pathway and documentation for implementation of BMP's is known to be varied among different Management Areas due to contacts, abilities and staff turnover. As part of this project, ODA will investigate a common repository or website for accepted restoration BMP's for Mercury which may be expanded for other uses in the future.

Compliance

Strategy 9) ODA Compliance Activities

ODA is the legislative authority for enforcement of water quality rules within Oregon's agriculture. The mission of ODAs Agricultural Water Quality (AgWQ) compliance program is to help landowners prevent and control water pollution from agricultural activities and soil erosion in a manner consistent with agricultural viability. Although the AgWQ program philosophy is to encourage voluntary approaches, program statutes and administrative rules allow the program to use compliance and enforcement actions when needed to correct violations of Oregon's water quality laws. Compliance cases may be initiated from a complaint, staff observation, or notification from another agency. Additionally, ODAs AgWQ program may actively identify potential problems and self-initiate compliance cases or utilize methodology from the SIA process to create a case.

The AgWQ compliance program regulates two common rules statewide: the streamside vegetation rule and the waste rule (ORS 468B.025). The streamside vegetation rule requires that agricultural activities allow riparian vegetation to establish and grow to provide three main functions: bank stability, filtration of overland flow, and shade. The first two being more pertinent to sediment control. The waste rule prohibits causing pollution or placing wastes where they are likely to escape or be carried into waters of the state. It addresses a wide variety of water quality issues, including manure and fertilizer runoff, irrigation return flow, and most pertinent to the Mercury TMDL, sediment delivery. The AgWQ compliance program is responsible for enforcing the waste rule with respect to agriculture. Farm roads (private roadways on agricultural lands used for agricultural purposes) are included in ODA's compliance oversight; ODA will document expectations and BMPs for farm roads.

Progress and monitoring of compliance cases are tracked through the number of cases open, number brought into compliance, already in compliance, pre-enforcement notifications, notice of non-compliance, and civil penalties.

The ODA Process Management System tracks the efficiency of compliance with goals of case reviews performed within 30 days and site visits to agency action less than 45 days.

Restoration efforts, and on-the-ground practices achieved as the result of the agricultural water quality compliance program need to be incorporated into our standard data flow – this is more specifically addressed with Strategy (11) ODA Compliance and Voluntary Data.

There are no landscape goals or targets associated with Compliance Cases.

Strategy 10) Area Rule Review

ODA must evaluate the Area Rules to address their adequacy for the Willamette Mercury TMDL. ODA will review Area Rules within the Management Areas to assess whether they are sufficient

in providing guidance and incentive in accomplishing the requirements of the Willamette Mercury TMDL. ODA must be clear; sedimentation is a pollutant and cannot enter, or be placed where it is likely to enter, waters of the state, as defined in ORS 468B.025 Pollutions of waters of the state are not allowed. Soil is to be kept in place.

TSS is the measurable surrogate for mercury pollution, and TSS targets are listed in Table (4) Scheduled TSS Reductions and Targets. ODA will develop standard procedures for standardizing TSS data collection and analysis for compliance purposes. A common approach of erosion analysis is the water testing above and below the point of suspected disturbance in the main flow of the water.

ODA may work with OSU Extension to develop suggested best management practices for specific crops, such as grass, hazelnuts, grapes, Christmas trees, and strawberries, dependent on staff availability and funding sources.

After partner and public outreach, ODA will work through an internal process to strategically review Area Rules. If deemed necessary, a formal process will be initiated to review and update the Area Rules.

The questions to ask are:

1. Are voluntary efforts sufficient, without additional rules, to make the necessary reductions in sedimentation?
2. Are the current Area Rules specific enough for sedimentation that people correlate the rule with specific agricultural land management practices?
3. Is the obstacle for successful, widespread adoption of sedimentation reduction practices largely due to lack of specificity in Area Rules, available money/resources for agricultural water quality improvements, or lack of knowledge of the problem?

Specific Mercury (TSS) sampling and analysis procedures will be developed for compliance purposes. Crop specific recommended implementation BMP's will be developed as staffing & funding allow. Area Rules will be reviewed based on voluntary landscape implementations.

Strategy 11) ODA Compliance and Cooperative Data

Currently, ODA does not have the staff capacity to track agricultural water quality improvement efforts that occur based on compliance activities. These efforts may occur cooperatively without assistance, or may be coordinated through local agencies such as SWCD's, NRCS, etc. ODA needs to develop a data path, such that these activities are tracked just like all our other program data. The data must be tied to a compliance visit or activity, logged in a baseline database such as SOW, NRCS, or OWRI, and traceable to the activity effects (e.g., sedimentation practices).

Agricultural water quality practices are sometimes completed without being recorded in a baseline database, for example an exclusion fence might be erected without going through the

SWCD or NRCS. ODA must develop a pathway for this data to be recorded in a baseline database or create an extension to a new Cooperative Database tied to our baseline SOW database.

The ODA compliance and cooperative data will likely be done either in conjunction with Strategy 15) ODA Data Flow & Reporting, or at the very end of completing that Strategy.

ODA's goal is to have landscape actions resulting from compliance activities being accounted for in our in our general Data Flow by 2029

This timeline is dependent on available resources and could be done sooner with implementation funds.

Strategy 12) Strategic Implementation Area (SIA) Compliance Evaluation

ODA conducts a pre and post compliance evaluation for all SIA Bare ground, riparian conditions, livestock activity, and farm roads are the main factors reviewed for sedimentation purposes. . This evaluation has a tracking metric of LC – likely in compliance, RO – restoration opportunity, CO – compliance opportunity, and PV – potential violation. These are visible and published in the Area Plans.

This strategy coexists with Strategy 8) EPA Restoration Grant SIA Focus and the Fiscal Analysis funding requests. As designed, the standard SIA program is not large enough to have an effect on the Willamette Mercury TMDL and does not include enough staffing or monitoring dollars. Through the EPA Restoration Grant, ODA may have some additional funds for the accomplishment of three SIAs within the Willamette Basin over the next five years. However, ODA needs to seek long term funding for TMDL implementation, as well as the impending TMDL's coming into the agricultural arena in Oregon.

Monitoring

Strategy 13) Calculation of Erosion Reduction Index

Effective management and success in this large-scale effort will require GIS analysis and/or model(s) to assess and prioritize restoration efforts within the watershed.

There are calculations and models available which can provide an objective calculation of erosion liabilities utilizing a form of the Universal Soil Loss Equation (USLE). These numeric values can be utilized to 'color-code' a geographic map on the priority level of landscapes for restoration. Any such modeling effort will require an effort of on-the-ground verification in initial stages.

ODA will work with DEQ and other state agencies in assessment of modelling approaches and resources, but will work independently as needed to get useful, meaningful data for the agricultural environment.

Additional resources will be needed to make significant progress with this strategy. Resources needed include an additional GIS Specialist, as the existing GIS specialist is quickly becoming fully allocated. A Riparian Specialist is needed for landscape assessments and model verification. Most of the infrastructure needs are being upgraded through ODAs IT Strategic Plan, but a dedicated GIS computational computer will be needed for the complex modeling calculations.

Strategy 14) Vegetative Cover Assessments in Winter

The number one priority in the TMDL is to reduce sediment (TSS), especially after a rain/storm event. This occurs mostly during the winter and is largely due to inadequate filtration/vegetation within the riparian area as well as upland/upslope watersheds. Therefore, a direct correlation between vegetative cover in the winter and TSS loading can be made.

There are three goals with this strategy 1) determine a GIS Method to identify vegetative cover in the winter, 2) determine and demonstrate a correlation/relationship between TSS loading and vegetative cover in winter, and 3) develop an overall goal that relates vegetative cover in winter required to meet TSS reduction milestones.

Initial estimate/goals:

Year	TMDL TSS Reduction *	Bare Ground Reduction in Winter
2024	10%	0%
2029	20%	20%
2039	50%	50%
2049	75%	75%

*This TMDL TSS Reduction goal is specifically for reducing TSS after a rain event

ODA staff are in the initial stages of determining the path forward with 2024 set as the goal for completing the first winter vegetation assessments. Determining locations for restoration and TSS monitoring are likely to come from the EPA Restoration Grant SIA Assessments (Strategy 8), from which the correlations will be determined.

This strategy largely utilizes existing or planned resources for a smaller SIA scale basis, but monitoring in general will be needed outside of the SIA to greatly expand this strategy.

Additional resources, identical to Strategy 13) Calculation of Erosion Reduction Index, will be needed to make significant progress with this strategy. Resources needed include an additional GIS Specialist, as the existing GIS specialist is quickly becoming fully allocated. A Riparian Specialist is needed for landscape assessments. Public messaging and additional water quality specialists will also be needed to be most effective; as this TMDL covers such a large geographic area with disparate, localized issues. Most of the infrastructure needs are being upgraded through ODAs IT Strategic Plan, but a dedicated GIS computational computer will be needed for the complex modeling calculations.

Strategy 15) Data Flow and Reporting

Oregon Department of Agriculture has a requirement to update this implementation plan and to report annually on activities that improve water quality for this TMDL, as well as outputs and landscape outcomes on agricultural lands. Agricultural lands are diverse and wide. This TMDL covers parts of 10 Management Areas and there are more TMDL's coming soon with the similar reporting requirements.

ODA's restoration efforts are wholistic coming from cooperation among many sources, including ODA programs, SWCD's, NRCS, OWEB, others, and voluntary efforts. It is important that all restoration efforts be reported via some reporting mechanism, such that we can track progress and effectiveness for the agricultural community.

ODA has recently begun to streamline ODA program's data flow, such that it is easier to input, track and report. Those data sources include Scope of Work, Strategic Implementation Areas, Focus Areas, Compliance, and Voluntary. Each of those data sources can be considered a milestone, and we have a goal to complete the data flow process for each of them by the end of the five-year implementation phase (2029).

Since ODA comingles efforts with other state and federal Agencies, ODA must also be able to report on efforts made via those sources, namely NRCS, CREP, and OWRI. Data agreements and structures are being pursued to facilitate ease of data sharing. The efforts on agricultural lands can't be evaluated or prioritized unless we view the whole efforts and monitoring of the watershed community. There have been bottlenecks in getting this data shared among agencies and resolving this hurdle is a large part of this strategy being effective.

This effort will largely be achieved with existing resources. There will be some contracted Database Management Systems (DBMS) efforts needed, for which some grants are being pursued regarding getting this work done. In the longer term, an SQL Database administrator will be needed to satisfy all ODA's program needs.

Strategy 16) State Agency Collaborative Monitoring

The monitoring of vegetative assessments and TSS is a requirement to measure the progress, or lack of progress, in reducing Willamette mercury pollution within the basin. There are long-term ambient monitoring sites that will help with the assessment, but those sites are not adequate to determine progress. Vegetation analysis and computation can be time consuming

and expensive, a common approach with shared resources would allow for shared expenses and efforts toward the same goal. The requirement of monitoring comes from the Clean Water Act, via the Federal EPA through the Oregon DEQ; however, there was no money that came with the requirements.

It is essential that the major parties involved, DEQ, ODA, and ODF at a minimum do the following: 1) have a combined approach such that our efforts and data complement each other, 2) solicit State Legislature in a coordinated effort to obtain funds adequate to address the monitoring and restoration efforts required to make effective progress on improving Willamette mercury water quality.

A milestone will be joint State Agency meeting(s) to discuss the approach and scope of alignment necessary to develop coordinated messages and boundaries. It is our goal to solicit legislative funding in the next biennium, so the timeline for coordinated meetings will be by the end of 2023 with discussions to follow through 2025.

Strategy 17) SWCD Monitoring of Total Suspended Solids (TSS)

Oregon Department of Agriculture has three initiatives in which TSS monitoring can be achieved: the Scope of Work (SOW), the Strategic Implementation Area (SIA) and the Focus Area. Within the Willamette Basin, coordination of all three programs through the lense of the Willamette Mercury TMDL will offer the greatest, most effective benefit for water quality.

Data flow and interoperability is discussed in Strategy 15) Data Flow and Reporting. The focus and need of the monitoring will be determined by Strategies 13) Calculation of Erosion Reduction Index, 14) Vegetative Cover Assessments in Winter and 16) State Agency Collaborative Monitoring.

There is currently no funding for extra monitoring associated with the Willamette Mercury TMDL. The Fiscal Analysis describes obtaining funds to expand the SIA program to include TMDL's in a modified approach.

Strategy 18) ODA Annual Reporting Web Map Publication

An individual annual report for each TMDL in the state is not sustainable with current staffing and resources. Reporting of activities and achievements made within the Willamette TMDL area, specific to reducing erosion is a more powerful, visual, useful, and sustainable product. This can be done with a combined web map and application. The reporting tool will be built such that reporting for specific management practices and TMDL's can be performed.

This strategy is dependent on Strategy 15) Data Flow and Reporting.

Milestones will be:

1. Stakeholder engagement in discussing Management Area efforts, outputs, and outcomes publicly.
2. Creation of a visual web-map display with associated permissions and viewing of aggregations or blurring of activities

ODA's goal is to create a web-map that shows activities and progress toward meeting Willamette Mercury TMDL goals.

Resources needed to complete this web map will add to the GIS Specialist, such that this adds to the requirement for an additional GIS Specialist.

Compliance with Land Use Rules

All strategies within this plan are designed to educate, encourage, assist, document and/or monitor land use strategies that are in compliance with Land Use Rules and achieve statewide land use goals. Improving water quality is a long-term process with many moving parts and the long-term goals will be achieved through a process of education, strategic implementation, monitoring, and adaptive management within the constraints of the Land Use Rules. Land use rules may need to be modified if sufficient progress on state land use goals, such as this Willamette Mercury TMDL are not being met.

Performance Monitoring and Adaptive Management

The ODA implementation matrix (Appendix C) contains the core key components of the five-year implementation plan. Each of the strategies contains assessment parameters, milestones and/or goals. Annually, the 'Adaptive Management' and 'Status' columns will be updated to monitor progress with each of the strategies. Some of the strategies require, or assume, additional funding resources, therefore progress on these elements will be affected by acquisition of funds. Results of this funding acquisition will also be included within the annual report.

A complementary piece to the annual report will be a web-map showing the status, results, and efforts within the agricultural areas of the Willamette Basin temperature TMDL. ODA's IS Strategic Plan will allow this annual data presentation, but there are intermediate milestones which must be completed prior to this annual reporting mechanism. Prioritization and funding will determine the timeline of this deliverable but will likely be toward the end of this five-year cycle, if not the beginning of the next cycle.

Re-evaluation of the key implementation strategies will be reviewed every five years. At this time, each strategy will be reviewed for effectiveness, further refinement, or deletion; additional strategies to be added will also be considered at this time. This is also the time when a revised 5-year Willamette Mercury Implementation Plan will be developed and submitted to DEQ for review. Any TMDL revisions will be considered at this time.

Resource Analysis

The Federal Clean Water Act Willamette Mercury TMDL Rule came to the Oregon Department of Agriculture with no money for staffing or on-the-ground restoration efforts. Full implementation of this plan requires additional resources.

Staffing

A Riparian Specialist is needed for overall watershed assessments, evaluations, and on-the-ground analysis. This Natural Resource Specialist 4 would complement and work directly with the Monitoring Specialist, Initiatives Coordinator, and the GIS Specialist. Duties would be reviewing and analysis of watersheds via images, photos, and on-the ground reviews. This hire must have GIS background and experience, preferably with landscape assessments using remote analysis. ODA review and assessment of restoration activities, as well as follow-up and check-in on success/failure/status of past restorations. Assist in development and review of implementation plans, strategies, and monitoring objectives for riparian plans. Implementing the Willamette Mercury TMDL itself will not require a full time equivalent (FTE) in the long term, however, training and Willamette Mercury TMDL work would be a full FTE for the first year. Subsequent years it is estimated a 0.4 FTE, where the extra time will be directed at the impending temperature and bacteria TMDL's. Currently, this function is being done as a team effort, and therefore the goals are smaller than can be achieved, and projects are often postponed due to higher prioritization of current staff's primary job functions.

An SQL Database Administrator is needed to achieve ODA's goal of efficient shared data among all NRPA programs and partners, where applicable. The impending web maps and web applications require an underlying SQL Database Administrator to keep data flowing from partners, to ODA, and across ODA programs. ODA currently has one person on staff with this capability, but this is not this employee's core job function, and therefore a large bottleneck to the implementation plan. Currently, we are seeing delays in project implementation, that will only be greater with further needs put on the ODA program.

An additional GIS Specialist, Natural Resource Specialist 3, will be required to handle the workload of not only this TMDL, but all the TMDL's impacting the state agricultural lands. The GIS Specialist will have duties in creating maps and drawings, performing imaging calculations, and updating SIA maps and base field maps. As with the Riparian Specialist, a full FTE is not needed specifically for the Willamette TMDL, but the with training the first year would be a full FTE. Subsequent years it is estimated the Willamette Mercury TMDL to be a 0.4 FTE, where the extra time will be directed at other TMDL's. Currently, we can maintain our GIS maps and structures but adding application support and data flow responsibilities to our current 1 position is not sustainable and will lead to delays in implementation.

A key component to success in all the new TMDL's is education and outreach of the issues, getting the word out, documenting BMPs, organizing meetings and messages, and social media messaging. To provide adequate outreach to the public and landowners the program needs additional staffing of a Public Relations Specialist, Natural Resource Specialist 3, for performing

these important duties. ODA currently has program-wide publicity personnel to offer direction and support, but there are no staff to help with content creation, maintenance, and monitoring.

A plan to expand the Strategic Implementation Area (SIA) program to accommodate TMDLs is needed. The existing SIA structure is not adequate to handle TMDLs effectively. Management of these new SIAs will require staff to manage the SIAs, facilitate cooperation with landowners, evaluate funding sources, be a resource to the local SWCD's and NGO groups. ODA estimates three new Regional Water Quality staff (NRCS3) will be needed for this new enhanced program. There is an additional funding component associated with this request also, referenced below. The current staffing levels accommodate approximately 1-2 smaller SIAs per biennium, through the EPA Toxic Grant we can enhance 3 of those SIA's in the next 5 years. However, this does not meet the needs of greatly expanding efforts for this very large area Willamette Mercury TMDL. Therefore, actual progress will be much slower than the goals published within the TMDL.

Staffing Needs
1 Position / 1 FTE (Natural Resource Specialist 4) – Riparian
1 Position / 1 FTE (Natural Resource Specialist 3) – GIS
3 Position / 3 FTE (Natural Resource Specialist 3) – Water Quality
1 Position / 1 FTE (Natural Resource Specialist 3?) – Public Relations
1 Position/1 FTE (Information Technology Platforms and Systems Manager 3) - (SQL Database Administrator)

Implementation Resources

The agricultural community is diverse, broad, and comprised of many small businesses and family farms. Approaching this agricultural community with requirements, and no money available to offset the costs of implementation will not maximize effective results.

The Willamette mercury sedimentation problem is a multi-million-dollar issue, which must be addressed in many forms and different approaches to be successful. All approaches require funds to be successful, and all must be governed or monitored to ensure effective use.

ODA continually evaluates programs to optimize use of funds, as well as request additional funds for program needs. Following are three gaps in funding resources to adequately address the Willamette Mercury TMDL.

1. Increased Strategic Implementation Area funding to expand efforts in a larger geographic area with the required monitoring. These increased funds will be needed for both landscape resource restoration and monitoring. Increased ODA WQ Grant funding – ODA's community partners have the resources and needs to implement monitoring and restoration activities, as evidenced by the successful implementation of ODA WQ Grants. The Willamette Mercury TMDL, and the pending TMDLs, will put more pressure, opportunities, and need on the conservation communities. A multi-state agency budget allocation for restoration activities on the ground related to the Willamette Mercury

TMDL. This is a State problem, not just an ODA problem, a common voice among partner agencies in a joint funding request for restoration money in the Willamette Mercury TMDL would be more successful than disparate requests. Successful implementation of this funding source could be the model funding source for future TMDLs also.

Without additional resources, progress will be much slower than targeted within the Willamette Mercury TMDL. The need is there, but it requires a commitment from society to fund this change.

ODA Facilities and Operations

For efficient completion of these water quality management strategies, hardware and software will be required for complete implementation. These include dedicated imagery computational computer and software, which can be tied up for days performing analysis. It is important that these computers are standalone, such that routine updates and maintenance do not interfere with multi-day model calculation processes. There are also skillsets required in which it is more efficient to hire components of the work done, for example ESRI contracting for GIS work, and relational database structural completion for integration to GIS. ODA continues to improve its resources in this area, but this is a long-term process which means those facilities aren't all available at this time. This results in a longer timeframe for implementation than desired.

Publication

The Agricultural Water Quality Management Plans are currently and will continue to be updated and posted on the ODA website on a rigorous schedule, described in Strategy 3) Area Plan Updates & Measurable Objectives.

Oregon Department of Agriculture will have the current five-year implementation plan published on the ODA Website as revised on the five-year schedule.

Annually, a report will be created which abbreviates the Implementation Plan within an Implementation Matrix as shown in Appendix A) Implementation Matrix, and the Status column will be updated for each implementation strategy. An accompanying web map showing relevant data will be published along with the annual report. The web map component will begin to be published after completion and verification of accurate data; targeted completion is by 2029 but is contingent on ODA available resources.

Appendix A. References and Links

1) Mercury “home page” (www.oregon.gov/deq/wq/tmdls/Pages/willhgtmdlac2018.aspx)
2) EPA Final Willamette Mercury TMDL; 2/4/21 (www.epa.gov/sites/production/files/2021-02/documents/tmdl-willamette-mercury-final-02-04-2021.pdf)
3) DEQ Willamette Basin Mercury TMDL, including WQMP; 11/22/19 (www.oregon.gov/deq/wq/Documents/willHgtmdlwqmpF.pdf)
4) DEQ Willamette Mercury Technical Support Document; 12/16/2019 (https://www.epa.gov/sites/default/files/2019-12/documents/tmdl-willamette-mercury-technical-support-document.pdf)

Appendix B. ODA Willamette Mercury Implementation Matrix

POLLUTANT: Mercury (Willamette Basin)			ODA Ag Water Quality Program				TIME FRAME: Annual Reporting and 5-Year Planning (2024-2028)		
S#	**SOURCE**	**STRATEGY**	**HOW**	**FISCAL ANALYSIS**	**MEASURE**	**TIMELINE**	**MILESTONE**	**ADAPTIVE MGM'T**	**STATUS**
Strat-egy #	What sources of this pollutant are under your jurisdiction?	What is being done, or what will you do, to reduce and/or control pollution from this source?	Specifically, how will this be done?	Existing resources *(most strategies need additional resources; this is addressed in the 5-year plan)*	How will you quantitatively or qualitatively demonstrate successful implementation or completion of this strategy?	When do you expect it to be completed?	What intermediate goals do you expect to achieve, and by when, to know progress is being made?	Indicate how strategies have changed with annual review reports	Include summary and date *(with annual report notes)*
Monitoring Strategy Question 1 - Inputs and Outputs									
	Q1. What activities are being done to help achieve desired land conditions and water quality?								
S1	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Inputs (ODA Stakeholder Outreach):** Engage stakeholders to discuss ODA approach to mercury TMDL	Present ODA approach to statewide and local stakeholders and solicit input	Existing $: current ODA staff	(1) # presentations, by year (2) # non-ODA attendees, by year	Ongoing	(1) 10 presentations per year (note: presentations at LAC meetings are not counted here; see Strategy 11)	Develop and refine messages for external audiences	2024- first annual report
S2	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Public Messaging:** Develop and implement effective messaging to reduce erosion to the public	ODA work with partners to identify or develop effective messaging; utilizing 1) existing staff, 2) new PR staff, 3) hired marketing campaign	1) Existing $: current ODA staff 2) new PR Hire 3) marketing campaign consultant All options would need additional $ for publications, materials, surveys	Targeted community surveys of message recognition and knowledge	Timeline is highly dependant on funding	Message(s) identificate Target audience(s) Delivery method(s) Success measure(s)	The WQ issues and corrective measures are not widely known	2024- first annual report
S3	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Area Plan Updates & Measurable Objectives** Conduct biennial reviews of 10 Area Plans where mercury TMDL applies	DEQ-ODA presentation and LAC discussion; update Area Plan during "full" reviews only; add Tss S&T in all Area Plans	Existing $: current ODA budget will cover this work; however, currently the Upper Willamette RWQS is vacant and may cause delays	For Willamette basin: (1) # full reviews completed w/ DEQ-ODA & LAC (2) # light reviews w/ DEQ-ODA & LAC (3) MO's and Tss in 100% of Area Plans/or noted for insertion at next Full Review	(1) First Plan Cycl add mercury TMDL text to all Area Plans (2) Next cycle insert one or more TMDL measurable objectives	Progression of Area Plans within the TMDL area	Area plans will be updated as needed with any Area Rule changes	2024- first annual report
S4	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Inputs (SOW & SIA - LO Engagement, TA, Seeking Funding):** SWCDs engage LO and provide TA; SWCDs seek funding for practices Focus on Sediment	Inform LO of link between erosion and mercury, beneficial management practices, assistance available; SWCDs seek funding and align efforts with partners	Existing $: (1) OWEB SOW funding for 11 SWCDs (2) OWEB SIA TA funding for SIAs	By MA, by year: (1) # events that actively engage LO (2) # LO at these events (3) # LO provided with TA (4) # site visits (5) # funding proposals submitted (6) # funding proposals awarded (7) # conservation plans written	Ongoing; it will take decades to engage and assist LO; SIA process is 4 years	2024 to 2027: milestones will be developed based on 2021 and 2022 annual results	Reporting by MA and identification of mercury (remedy) specific practices	2024 - first annual report
S5	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Outputs (SOW & SIA - Practices Implemented):** SWCDs implement on-the-ground practices Focus on Sediment	SWCDs and partners help LO implement practices that reduce mercury inputs to water bodies	Existing $: (1) 10/11 SWCDs have a tax base that may fund additional projects (2) Other funding (NRCS/FSA, OWEB, DEQ 319 grants)	By MA, by year: (1) Practice Groups (Upland = Irrigation, Fence, Woody Pl, Cover Pl, Heavy Use Area; Riparian = Woody Pl, Fence, Livestock W); acres, feet, # (2) # Practices (Upland, Riparian, Total), from Practice Group data (3) Make data visible locally such that local entity	(1)(2) Ongoing; it will take decades to achieve load reduction target; SIA process takes 4 years (3) By 2027	2024 to 2027: milestones will be developed based on 2020 to 2022 annual results	2024 - improved consistency and accuracy of reporting for SOW and SIA	2024 - first annual report
S6	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Outputs (Ag Drainage Channel Maintenance):** Maintenance and regulation of Ag Drainage Channels via Notices of Work and monitoring	Program to monitor and regulate agricultural maintenance of natural drainage channels restoring bank stabilization after maintenance	Existing $:	By MA, by year: Continually tracked by miles of channel maintained	Ongoing; this is a long-term ODA program, although it is new	2024 to 2027: ODA's goal is to increase program utilization each year	This is a new program, so adaptive management has not happened	2024- first annual report
S7	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Outputs (NRCS and FSA-CREP Practices Implemented):** NRCS and FSA implement on-the-ground practices Focus on Sediment	NRCS, FSA, and partners help LO implement practices that reduce mercury inputs to water bodies	Existing $: NRCS/FSA Farm Bill conservation programs; FSA = CREP	By MA, by year: (1) Practice Groups (Upland = Irrigation, Fence, Woody Pl, Cover Pl, Heavy Use Area; Riparian = Woody Pl, Fence, Livestock W); in acres, feet, # (2) # Practices (Upland, Riparian, Total), from Practice Group data	Ongoing; it will take decades to achieve load reduction target	2024 to 2027: milestones will be developed based on 2020 to 2022 annual results	2023 - Need to formalize agreements with NRCS and CREP to get annual data	2024- first annual report
S8	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**EPA Restoration Grant SIA Focus:** A new SIA Approach to Addressing Mercury	Includes: (1) Mercury BMP Development (2) Community Outreach methods alternatives (3) Monitoring techniques/methods	Assumes funding comes from EPA Grant & 3 SIAs	(1) BMP Development/adoption (2) #/type of community outreach events (3) Monitoring strategies developed	2024 thru 2029 assuming funding	(1) BMP - 2025 (2) 2025-2029 Outreach Numbers (3). 2025 Monitoring Strategies	Realization that effective TMDL implementation will require both compliance and voluntary efforts	2024- first annual report

POLLUTANT: Mercury (Willamette Basin)			ODA Ag Water Quality Program				TIME FRAME: Annual Reporting and 5-Year Planning (2024-2028)		
S#	**SOURCE**	**STRATEGY**	**HOW**	**FISCAL ANALYSIS**	**MEASURE**	**TIMELINE**	**MILESTONE**	**ADAPTIVE MGM'T**	**STATUS**
Strat-egy #	What sources of this pollutant are under your jurisdiction?	What is being done, or what will you do, to reduce and/or control pollution from this source?	Specifically, how will this be done?	Existing resources *(most strategies need additional resources; this is addressed in the 5-year plan)*	How will you quantitatively or qualitatively demonstrate successful implementation or completion of this strategy?	When do you expect it to be completed?	What intermediate goals do you expect to achieve, and by when, to know progress is being made?	Indicate how strategies have changed with annual review reports	Include summary and date *(with annual report notes)*
Monitoring Strategy Questions 2 & 3 - Compliance Rate									
	Q2. What percent of agricultural uplands are in compliance with the Waste Rule?								
	Q3. What percent of stream miles on agricultural lands are in compliance with the Streamside Vegetation Rule?								
S9	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Inputs & Outputs (ODA Compliance Cases):** Ensure compliance with relevant Ag WQ regulations (Area Rules)	ODA conduct investigations to ensure or achieve compliance with: waste rule, riparian rule, sediment rule (if applicable)	Existing $: current ODA staff	(1) Inputs: By MA, by year: # cases open (sediment, riparian, both) (2) Outputs: For Willamette Basin, by year: agency actions taken: # Already in compliance # Brought into compliance # Pre-enforcement notification # Notice of Noncompliance # Civil Penalty (3) Outputs: For Willamette Basin, by year: % of cases achieving PMS timelines	Ongoing, in response to complaints, agency notifications, and in SIAs	(1) No milestone (2) No milestone (3) 90% of cases achieve timelines identified in PMS (case review <= 30 days, site visit to agency action <= 45 days)	Added "farm roads" to ODA Compliance Database; need to add "farm roads" to metric (1)	2024- first annual report
S10	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Area Rules:** Analyze & Possibly Change Area Rules - are they adequate to ensure acheivable water quality goals	ODA evaluates Area Rules and Adequacy, gathers input from Stakeholders, proceed with changes as necessary (factors related to mercury: bare ground, riparian	Existing $: current ODA staff	(1) ODA Review Milestone (2) # of Area Rule Presentations (3) Beginning Process of Area Rule Changes	Any Area Rule changes to be started by 2028	(1) Completion of ODA Area Rule Review (2)No Milestone (3)Start of Area Rule Change Process (if reqd)	Extent of regulation changes has forced this ODA evaluation	2024- first annual report
S11	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**ODA Compliance & Voluntary Data:** ODA standardize Compliance Outcomes with ODA (NRCS) Practice Codes AND implementing method for entry of Voluntary Practices implemented in the field	ODA creates Outcomes Entry Method within Compliance Process. AND create Voluntary Practices entry method	Existing $: current ODA staff Database creation would speed implementation from contracted resource	By MA or Date, have the implemented practices available, both by Compliance and Voluntary	This is a new procedural practice to fall after the standardization of our basic internal data, goal to be complete by 2029	The data flow diagram, path, and process is to be created first	The TMDL requires quantification of sedimentation reduction practices and outcomes on an annual basis	2024- first annual report
S12	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**ODA SIA Compliance Evaluation:** ODA conducts Compliance Evaluation at start of SIA process and updates data through SIA process	ODA evaluates likely compliance via public domain summer imagery and field verification from public venues (factors related to mercury: bare ground, riparian conditions)	Existing $: current ODA staff	By MA, by SIA, # (%) tax lots at start and end of ODA SIA process: (1) LC = Likely in Compliance (2) RO = Restoration Opportunity (3) CO = Compliance Opportunity (4) PV = Potential Violation	Compliance evaluation is completed at beginning and updated at end of ODA 4-year SIA process	By the end of the 4-year ODA SIA process, all ag taxlots are LC (Likely in Compliance) or RO (Restoration Opportunity)	Will add "farm roads" to the Compliance Evaluation process (record in notes section)	2024- first annual report
S13	(1) Eroded sediment from ag lands (2) Runoff of water from ag lands	**Outputs (DEQ/ODA-Calculation of Erosion Index):** GIS Analysis/modeling of susceptibility of landscape to erosion	DEQ/ODA calculates erosion susceptibility from landscape parameters derived from aerial images	Existing $: current DEQ/ODA staff will conduct the analysis and report to ODA	By MA and year: The Erosion Index will give a priority for restoration efforts	Ongoing	The first milestone will be the initial model output Next will be ground verification	This strategy is needed due to the size and scope of the TMDL	2024- first annual report
S14	Eroded sediment from bare ag lands in winter	**Outcomes (Vegetative Cover Evaluation of Ag Lands in Winter):** Assess upland ag conditions that reduce erosion	ODA conduct remote assessments of cover on ag lands in winter: (1) Coarse visual assessment (2) Remote sensing automated analysis	Existing $: (1) Current ODA staff (2) Current ODA staff will conduct pilot(s); unlikely that ODA has the capacity to scale this up to entire Willamette Basin Needs: Riparian Specialist & additional GIS Specialist	(1) By MA: HUC-12s with more or less winter cover - classes TBD (#, %) (2) By MA: ag lands with cover (acres, %)	Pilot Assessments to be available 2024 and expected to improve with DEQ Imagery Available and ODA Staffing	Milestones will be developed if/when results are available	DEQ-funded statewide riparian analysis (RFP for veg cover and height)	2024- first annual report

POLLUTANT: Mercury (Willamette Basin)			ODA Ag Water Quality Program				TIME FRAME: Annual Reporting and 5-Year Planning (2024-2028)		
S#	**SOURCE**	**STRATEGY**	**HOW**	**FISCAL ANALYSIS**	**MEASURE**	**TIMELINE**	**MILESTONE**	**ADAPTIVE MGM'T**	**STATUS**
Strat-egy #	What sources of this pollutant are under your jurisdiction?	What is being done, or what will you do, to reduce and/or control pollution from this source?	Specifically, how will this be done?	Existing resources *(most strategies need additional resources; this is addressed in the 5-year plan)*	How will you quantitatively or qualitatively demonstrate successful implementation or completion of this strategy?	When do you expect it to be completed?	What intermediate goals do you expect to achieve, and by when, to know progress is being made?	Indicate how strategies have changed with annual review reports	Include summary and date *(with annual report notes)*
Monitoring Strategy Question 8 - Water Quality Monitoring									
	Q8. How are water quality status and trends related to changes in agricultural upland and streamside vegetation conditions?								
S15	Eroded sediment from ag lands	**Outcomes (Data Flow & Reporting):** Make All Data common, contained in database, allowing direct entry & reporting	Standardize internal (SOW, SIA, FA, Compliance, Voluntary) & provide gateway for external data (OWRI, NRCS, CREP)	Existing $: This progression is within our Strategic Plan, but funding resources will accelerate the implementation of this strategy	(1) percentage of data contained in databases (2) Percent of data reported from databases	The timeline will depend on funding sources, but pilot stages will be completed in 2023-25 biennium Goal to have internal data processes complete by 2029	Each data source implemented in a database is a milestone	The TMDL Requirements necessitate data being reported from a database	2024- first annual report
S16	Eroded sediment from ag lands	**Outcomes (WQ Monitoring of TSS):** Monitoring TSS on ag lands, and in conjunction with other State DMAs and DEQ	(1) Discussions with other State DMAs regarding coordinated TMDL Monitoring/Utilizing common tools (ODF,DEQ) (2) Develop Plan Outline (3) Request Legislative Funding	Existing $:	Documentation of Discussions, Plan Outline and Funding Request	The full-cycle of discussions, plan outline and funding request to be completed by 2028 (5yrs)	Multi-agency plan for monitoring data	The TMDL Requirements necessitate a cooperative State arrangement	2024- first annual report
S17	Eroded sediment from ag lands	**Outcomes (WQ Monitoring of TSS):** SWCDs monitor TSS on ag lands	(1) Prioritize Existing Ambient Sites for Ag & Identify Holes (2) SWCDs in SIAs (3) SWCDs in Focus Areas	Existing $: (1) Monitoring Specialist (2) OWEB SIA monitoring grants (3) OWEB SOW for 1 Focus Area	By MA, by year: maximum TSS in mg/L	(1) Prioritized 2025. (2) SIAs up to 10 years of monitoring (3) Focus Area monitoring timeline is undefined	Milestones are the TSS targets listed in Table 10-2 of the TMDL	ODA is asking Willamette basin SIAs to include TSS	2024- first annual report
S18	Eroded sediment from ag lands	**Outcomes (ODA Annual Reporting Web Map Publication):** ODA create a visible map of erosion objectives and monitoring results	Utilize currently developing ODA infrastructure to report and visualize Area goals and progress	Existing $ and program strategies will get us most of the way there, additional funding via grants and/or legislature will be used for specific aspects of Area Plan Reporting Strategy	Through visible publication of results on the website maximum TSS in mg/L	This project will be prioritized within our ODA IS Strategic Implementation Plan	(1) Hardware and software installed via Strategic Imp Plan (2) Data use, visualization and entry projects pilots beginning in 2023 with LUBGWMA	Momentum of technology, integrated reports, SWCD interest in technology use, and TMDL requirements require this modernization	2024- first annual report

Appendix C. ODA Abstract of EPA Columbia River Toxic Reduction Restoration Grant 2023

EPA Columbia River Restoration Grant ODA Water Quality Program Application Abstract (for add-on to larger application)

Title: Increase Agriculture Water Quality BMP's Utilization Through an Enhanced Statewide ODA Strategic Implementation Area Program

Date: February 28, 2023

Objective:

- Reduce agricultural runoff to surface waters through increased strategic use of BMPs to meet Hg TMDL Benchmarks. The following activities will be used to meet this objective:
  - Develop standard effectiveness monitoring techniques and strategic implementation in cooperation with ODA, OSU Extension Service (OSUES), DEQ and OWEB.
  - Enhance technical education of site-specific BMP modifications to improve effectiveness, expand outreach (i.e., messaging) to increase engagement of the agriculture community in addressing water quality, and develop watershed-specific goals around Agricultural BMP's associated with the Hg TMDL Program
  - Implement a Public Data Viewing Platform for Monitoring to Reinforce Communication, Education and Outreach around Agricultural BMP's as they are in progress

How:

Modify ODA's current Statewide Strategic Initiative Area Implementation by implementing effectiveness monitoring programs first, using data and related technical information as part of enhanced community outreach to increase BMP implementation, and finishing the SIA process by sharing summaries of data, current conditions that include compliance monitoring, and goals for the practices and monitoring needs implemented.

Who:

Oregon Department of Agriculture	Oregon Dept of Fish and Wildlife
Oregon State University Extension Service	Oregon Watershed Enhancement Board
Oregon Dept. of Environmental Quality	Oregon Dept. of Forestry

Descriptive Notes

A. Develop Ag BMPs Education and Outreach Methods and Materials in cooperation with Oregon State University Extension
    a. Define Purpose, Consistency and Messaging for Agricultural Best Practices to achieve TMDL Water Quality Methods:
        i. Establish vegetated riparian buffers and filter strips (e.g., planting, release and maintenance, fencing protection, off-site livestock watering), sediment-catch basins and facilities, and other erosion control practices.
        ii. Limit impacts of livestock exclusion areas, high-traffic areas (i.e.,trails and paths), and manure storage practices.
        iii. Invasive plants and control (e.g., identify and remove/limit impacts of invasive plants, replace with native vegetation, maintain improved areas)
        iv. Utilize suite of practices to prevent and minimize surface erosion from upland areas and sediment delivery to streams, including surface, streambank, and drainage ditches (i.e., road and field).
    b. Set SIA 'Emphasis' and Measurable Goals based on Pre-SIA Assessment
        i. Begin each SIA with a comprehensive SIA Assessment
        ii. Determine Public 'Emphasis' with SIA
        iii. Set Public 'Goals' to accomplish with SIA
    c. Assess Educational/Outreach Delivery Methods and Techniques (enlist sponsors such as Farm Bureau, Nursery, PNW Christmas Tree Assoc., Hazelnut Assoc., Rocky Mtn Elk, CCA, Tribes, BIPOC groups, pass thru a DEI lens, etc.)
        i. In-person farmer meetings and individual farm visits
        ii. In-person educational events (workshops, tours, etc.) involving farmers
        iii. Newsletter articles that commonly reach farm community (e.g., local newspapers, commodity newsletters, OSUES and SWCD newsletters, trade newsletters)
        iv. Open public opportunities that commonly reach farm community (e.g., Radio, Social Media, Fliers)
    d. Develop Standard Consistent Content and Format (in conjunction with DEI, tribal and BIPOC organizational input and review) that varies based on target audiences (e.g., ranging from large-scale farmers to small hobby farms).

B. Develop Standard SIA Effectiveness Monitoring Techniques that are strategically implemented

a. Emphasize effectiveness monitoring methods that measure current WQ conditions and potential improvement from implementing site-specific BMPs understood by agriculture Industry
b. Document typical/standard monitoring and survey techniques that can be utilized among ongoing monitoring plans, such as vegetation/organic material assessments, stream and drainage ditch water column monitoring, livestock exclusion and heavy-use area assessments, facility drainage assessments, erosion control practices in targeted areas, etc.
c. Combine efforts of ODA, OSUES, OWEB, DEQ

C. Implement Agriculture Friendly Data Viewing Platform for SIA Monitoring
   a. Utilize 'off-the-shelf' commercial platform for importing and viewing SIA monitoring data
   b. Data to be viewed/displayed immediately as imported
   c. Auto filtering of raw data set
   d. Type A data to be automatically shared to DEQ Database
   e. Develop 'standard' data viewing graphs and dashboard images that are relevant and correct

D. Develop Post SIA BMP implementation, education and outreach goals
   a. Hold agriculture-public event to share recent accomplishments, current data and conditions, and data gaps for future work (celebration-type event).
   b. Develop template documents for delivering SIA report messages
   c. Assess/develop delivery methods and techniques
   d. Develop Standard Consistent Content and Format

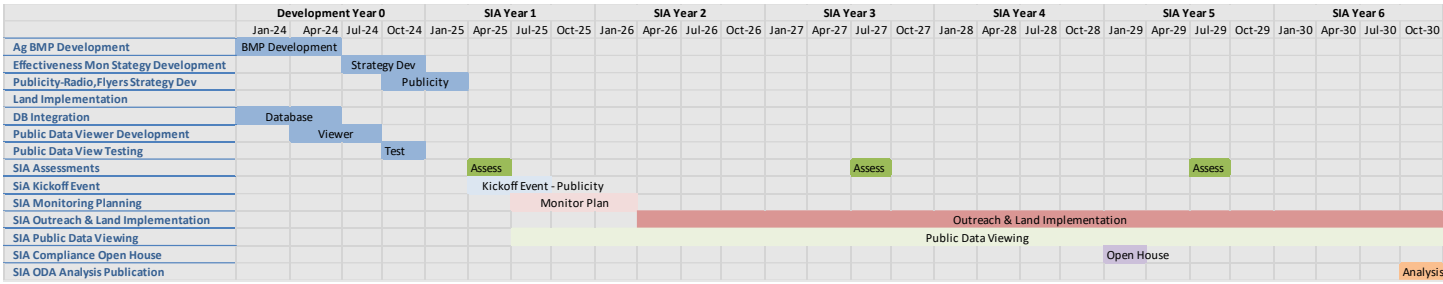
E. Procedures and processes to be utilized 2-3 Prototype SIA's beginning in 2024, to be expanded to our Statewide SIA process in the future as we discover the effectiveness and refine the approach

F. Currently, ODA has six existing SIAs within the Willamette Hg TMDL Area, three new SIA Locations would be chosen to implement this new SIA process, and the locations would be prioritized according to need, cooperation and capability. The following table details initial thoughts on implementation areas:

Subbasin Name	Subbasin #	Ag WQ Mgt Plan	NPS Total load contribution (%)	NPS Allocated Reduction (%)	5-Year SIA Schedule & Priority	SWCD	Notes
Coast Fork	17090002	Willamette - Southern	74	97	2022 A	Upper Willamette	Capacity?
Upper Willamette	17090003	Willamette - Upper	82	97	2021 A	Upper Willamette	Capacity?

Middle Willamette	17090007	Willamette - Upper	62	97	2023 A	Benton/Polk	
Tualatin	17090010	Tualatin	75	97	2022 A	Tualatin	
Lower Willamette	17090012	Willamette - Lower	57	97	2023 B	East & West Mult.	Lower % ag lands BUT urban link
Middle Fork Mckenzie North Santiam South Santiam Yamhill Molalla Pudding Clackamas	17090001 17090004 17090005 17090006 17090008 17090009 17090011	Willamette – Middle Willamette – Southern Molalla-Pudding South Santiam Yamhill Mollala-Pudding Clackamas	??	88	2023 A 2022 A 2020 A 2021 A 2020 A 2020 A 2020 A	Benton/Polk Upper Willamette Marion/Linn Linn Yamhill Clackamas/Marion Clackamas	

Approximate Timeline



Budget

Who	Description	Estimate	In-Kind
Develop SIA Ag BMP Education & Outreach Methods and Materials			
OSU	Ag BMP Prioritization/List for Hg TMDL	$6,000	
OSU	Ag BMP Documentation for Hg TMDL	$12,000	
OSU	Ag BMP Delivery Plan	$12,000	
ODA	Ag BMP Prioritization/Doc/Delivery		$39,000
Contractor	Ag BMP Promotion	$7,000	
Develop and Document Standard SIA Effectiveness Monitoring Techniques			
OSU	Prioritize Effectiveness Monitoring Techniques	$12,000	

OSU	Document Standard Effectiveness Monitoring Techniques	$12,000	
ODA	Prioritize & Document Std Effectiveness Monitoring Techniques		$14,000
Implement Public Friendly Data Viewing Platform for SIA Monitoring			
ODA	DB Framework Path		$49,000
Contractor	DB Integration	$150,000	
Contractor/Temp	Assistant DB Integration & Support	$50,000	
Contractor	Software/Data Maintenance	$120,000	
Develop Post SIA Education & Outreach Materials			
OSU	Area Outreach and Benefits Outreach Template	$6,000	
OSU	Review Area Outreach and Benefits Outreach Template	$3,000	
ODA	Area Outreach & Benefits Template and Review		$20,000
Strategic Area Implementation IN-FIELD (3 separate implementations)			
SWCD Partner	Documentation/Data/Process Feedback		
ODA	Implementation (Assessment, WQ Specialist, Compliance)		$128,000
ODA/Contractor	BMP Educational Material Costs & Delivery (3 @ $10,000)	$30,000	
Contractor	Ag BMP Promotion (3 @ $5,000)	$15,000	
Contractor	SIA Kickoff Event (3 @ $5,000)	$15,000	
ODA/LO	Land Uplift Implementation Seed Funds (3 @ $100,000)	$300,000	
OWEB	SIA Implementation Grant (3 @ $125,000)		
TOTALS		$750,000	$250,000