Thurston County On-site Septic System Management Plan

Prepared for:

Thurston County Environmental Health Division

Jean.frost@co.thurston.wa.us

GREENE ECONOMICS

Email: spostma@greeneeconomics.com

Website: greeneeconomics.com

Thurston County OSS Management Plan

Prepared for

Thurston County Environmental Health Division
3000 Pacific Ave. SE
Olympia, WA 98501

Prepared by

Greene Economics, LLC
20616 30th Ave. W
Lynnwood, WA 98036

~~**September 9**~~**November 14, 2025**

Contents

Appendices

Tables

Figures

Executive Summary

In 2005, the Washington State Board of Health adopted Chapter 246-272A WAC. This chapter requires all Puget Sound counties to develop a management plan for the On-site Sewage Systems (OSS) within their boundaries. The regulation established a shared responsibility model between OSS owners and local health departments. The following year, the state legislature enacted RCW 70A.110.~~118A~~, mandating that counties bordering Puget Sound designate Marine Recovery Areas (MRAs) where OSS are contributing to marine water quality degradation. The law also required counties to implement management strategies to locate and repair failing systems, maintain a comprehensive inventory of OSS, and ensure regular inspections.

In response to these regulations, Thurston County adopted its OSS Management Plan in 2008 through the Public Health and Social Services Department's Environmental Health Division. This plan was later updated and finalized in 2016, incorporating recommendations developed by an advisory committee that met from November 2013 to July 2014.

Since the adoption of the 2016 plan, significant progress has been made. New water quality studies and dashboards have been developed, and ongoing programs have been impactful – greatly increasing the number of known OSS in the county database, increasing OSS maintenance compliance, and reducing malfunctioning systems near critical waterways. In addition, performance data have been collected and analyzed to assess the effectiveness of past strategies and to identify ongoing gaps. This current plan is an update to the 2016 version. The recommendations in this plan were curated by Greene Economics, LLC (Greene Economics), an environmental economics consulting firm contracted by Thurston County to conduct the update. Importantly, statewide regulatory updates have also occurred. In January 2024, the Washington State Board of Health adopted new OSS codes that expand on the 2005 regulations. This updated OSS Management Plan ensures that Thurston County remains compliant with new state requirements while continuing to improve OSS management and protect water quality.

2025 Recommendations

Thurston County Environmental Health Division, supported by Greene Economics, recommends that the Thurston County Board of Health (Board of Health) take actions in the designation of sensitive areas (see Article IV Section 21 for description of sensitive areas),[1] to improve and develop better data, to plan for a changing climate, to assure quality control, strengthen county programs, and to optimize the funding for these actions. The following list details these recommendations, designed to meet the current challenges of OSS management in Thurston County.

Septic to Sewer Planning

- *Institute the low conversion alternative from the 2015 Urban Septic Assessment Report*: Help the c~~C~~ounty identify priority unincorporated areas in Urban Growth Areas (UGAs) for conversion from septic to sewer.

[1] Thurston County Environmental Health Division Public Health and Social Services Department. 2025. Article IV – Rules and Regulations of the Thurston County Board of Health Governing Treatment and Dispersal of Sewage. April. Available here.

- *Update the 1990 Sewerage General Plan*: Ensure that all entities within the county are on the same page for converting septic to sewer in unincorporated areas and have clear guidance on how and when these conversions should occur.

Designation of Sensitive Areas (SA) and Marine Recovery Areas (MRA)

- Based on a review of water quality data, Eld Inlet, Budd Inlet and the Deschutes River Watershed should be designated as an MRA and Watershed protection area, respectively. Summit Lake should be considered for Sensitive Area designation.

Database and Dashboards

- *Develop a point-based OSS layer:* It would include the following attributes: inspection status, date of last inspection, system type, system age, proximity to surface water, and a link to the most current system design drawing.
- *Establish an OSS dashboard and database:* The tool would include OSS information including septic system type, system age, date of last inspection, date of last pumping, and the most current OSS design drawing.
- *Link OSS data to existing water quality dashboard:* This would allow the public to see correlations between OSS functionality and location and water quality trends.
- *Use a StoryMap to relay importance of OSS maintenance:* The StoryMap could include depicting the improvement in water quality in Nisqually and Henderson through the Operational Certificate program. Other targeted projects could show the public how routine maintenance and upkeep of their OSS positively impacts water quality.

Climate Change Planning

- *Develop a climate change response plan for county OSS:* Leveraging existing work and climate data, this plan could help the county prepare OSS owners for issues such as sea level rise, floods, and drought.
- *Research and invest in alternative septic management systems*: This will provide residents with alternative options if their parcel is no longer conducive for typical OSS in the future due to climate change or other circumstances.

Quality Assurance and Control

- *Implement a robust program of quality assurance and control (QA/QC):* This will ensure that inspections and other maintenance are ~~completed properly~~properly completed and documented.
- *Establish metrics and targets to measure success of QA/QC and other programs*: Metrics and targets will allow the county to measure progress and success and identify programs that are not working as intended.

County Programs

- *Time of transfer (TOT) program*: Continue existing time of transfer program to meet new state mandates.
- *Groundwater quality program*: Develop a groundwater quality testing program to help identify groundwater potentially impacted by leaking OSS.

- *OSS inspection and pumping subsidies*: Continue funding existing subsidies and explore additional incentives to increase compliance by making inspections and pumping more affordable.
- *Proactive OSS education and outreach*: Continue ongoing educational efforts and institute proactive and positive engagement with the community regarding OSS via targeted social media campaigns, public meetings, workshops, attending and educating at public events, etc.
- *Pollution Identification and Correction Program*: Maintain the Pollution Identification and Correction (PIC) program to prioritize, assess, and investigate rivers, streams and marine shoreline areas that are experiencing elevated bacteria pollution; ~~and~~ investigate illicit discharges to the County's municipal storm sewer system; ~~,~~ and ensure OSS deficiencies and failures are repaired or replaced.
- *Inspection reminders*: Expand current regimen to include all OSS parcels to increase compliance county-wide.
- *Updating OSS Management Plan*: Update the plan every five years as required by state mandates.

OSS Local Management Plan Funding Strategies

- *Single flat fee to all OSS parcels throughout the county*: The fee would replace the current operation and maintenance (O&M) fees, pump report fees, Time of Transfer application fees, and MRA charges.
- *Tiered charge alternative*: This structure charges the highest amount for septic systems in Watershed Protection, Marine Recovery, or other special areas designated by the Board of Health, an intermediate amount for septic systems in Puget Sound watersheds outside of special areas, and a lower amount for septic systems in the Chehalis Watershed, also outside any special areas.
- *Add O&M fee to online RME report submittal:* The fee would replace the current O&M fees and pump report fees. The shellfish protection district charges within the designated Marine Recovery Areas would remain and would not require paying an O&M fee to online RME for any reports.
- *Standardize MRA and Sensitive Area fees:* This structure keeps the existing charges; the current O&M fees and pump report fees, and Time of Transfer application fees and would add charges for newly designated MRAs and sensitive areas.
- *Apply for Centennial Clean Water Grants or Alternative Grants:* This structure keeps the existing charges; the current O&M fees, pump report fees, and MRA charges. Thurston County would apply for centennial clean water or other relevant grants as applicable to promote O&M requirements in southern Thurston County.

Implementation Plan

The Thurston County Environmental Health Division should implement the recommended actions in the updated OSS Management Plan through a phased approach over the next five years. Phase 1 is to adopt the 2025 OSS Management Plan update. For Phase 2, the county should collaborate with the Board of Health to adopt a sustainable funding mechanism that supports countywide implementation of the plan. Phase 3 focuses on the designation of new MRAs and SAs. Finally, in Phase 4, the county should continue building on existing efforts, leveraging current initiatives and partnerships to make steady,

incremental progress toward full implementation of the plan's recommendations. This phased strategy would ensure both immediate action and long-term sustainability.

1. Introduction and Background

Greene Economics, LLC (Greene Economics or research team) was contracted by the Thurston County Environmental Health Division to update the 2016 Thurston County On-Site Sewage System (OSS) Management Plan in compliance with Chapter 246-272A WAC adopted by Washington State Board of Health in 2005. The Environmental Health Division provided guidance, technical information, water quality data, and an initial list of key stakeholders to the research team.

1.1. Process and Objective of the OSS Management Plan

The objective of the OSS Management Plan remains the same as that established for the 2016 plan: to meet the requirements of state law and meet the needs of the citizens of Thurston County. The proposed programs and policies must be reasonable to the public and protect public and environmental health across the county. The county can meet these objectives by ensuring that all OSS are properly designed, permitted, built, operated, and maintained or converted. The final recommended programs and updates are meant to help Thurston County accomplish these objectives.

Review of 2016 OSS Management Plan

The research team initiated this effort by reviewing the recommendations from the 2016 plan. Table 1 includes all the recommendations made in 2016, as well as the status of these recommendations. While many of the 2016 recommendations have been completed, those related to MRA establishment have notably not progressed. Recommendations that have not been implemented were re-evaluated using current information and discussed to formulate recommendations for the updated plan. In addition, those that have been implemented were assessed for their effectiveness and used to formulate recommendations for the updated plan.

Table 1. Status of 2016 OSS Management Plan Recommendations

2016 OSS Management Plan Recommendations	Status
Communicate concern to Washington State Department of Labor and Industry, that establishes electrical regulations, that a solution be found to the issue of electrical components corrosion associated with OSS.	Status unconfirmed – based on discussions with OSS professionals it appears that this issue has not been addressed but is not of huge concern.
Expand the use of online services (enable electronic submittal of certified homeowner inspection reports and applications, allow the public to submit permit application and make payments electronically, allow the public and county staff to complete and submit inspections electronically, automate transfer of OSS quarterly sample results from Online RME to county system)	Inspection reports must be submitted through OnlineRME.com;[2] payments can be made via phone, in person or through the mail; a suite of online services will become available once the new database is complete and published on Thurston County's

[2] Thurston County Washington, 2024, Homeowner Maintenance & Requirements. Available here

2016 OSS Management Plan Recommendations	Status
	website that will include online payment options.
Continue to complete the countywide OSS inventory and GIS (Geographic Information Systems) map layer that will establish a unique identifier for OSS that is not dependent upon tax parcel numbers and preserves the OSS history.	The county is continuing to work on their GIS map parcel-based layer – they create compliance maps annually. The new database will be more closely linked with GIS and help reduce some assumptions that were originally made regarding parcels that could have an OSS (because they aren't on sewer) or help identify parcels with multiple OSS on them (hoping the GIS will be updated bi-annually at a minimum).
Require all OSS inspections be submitted electronically by 12/2017	Inspection reports must be submitted to OnlineRME.com by either a septic professional or a certified homeowner;[3] with code update all OSS inspections must be submitted electronically.
Send notices to remind owners of gravity and pressure distribution OSS, who are not within the county's designated MRAs, that routine inspection and maintenance needs of the system should be done.	Those with simple OSS or those associated with a grant or water quality project receive O&M materials when new O&M requirements are released and when property with OSS is transferred; however, the county does not have the capacity to send routine inspection reminders to these folks. Those in OPC (Operational Permit Certificate) program receive mailed reminders to get their OSS inspected either annually or every 3 years, depending on system requirements.
The OSS program shall require that all OSS owners be routinely notified of the need to inspect their system, system component	This has been sporadically done by project area – no real strategy has been implemented. The Time of Transfer requires a system to be

[3] Thurston County Washington, 2024, Homeowner Maintenance & Requirements. Available here

2016 OSS Management Plan Recommendations	Status
deficiencies be corrected at time of property transfer, and septic design information for EVERY OSS in the county be in Online RME	inspected and pumped, with deficiencies reported to the O&M and PIC teams for follow-up compliance; septic design information is required at Time of Transfer.
The OSS Management Plan shall be reviewed at a minimum every three years to begin in 2018 and amended as needed.	New code requires the plan to be updated every 5 years, which is what Thurston County will be doing moving forward.
Eld Inlet and its watershed shall be designated as a Marine Recovery Area as soon as possible. Henderson and Nisqually Reach are currently Marine Recovery Areas; each has an enhanced O&M program for OSS within their boundaries. The documented marine water quality decline in Eld in the years since the inlet was reopened to shellfish harvest in 1998 is evidence that the area needs a program like Henderson and Nisqually to prevent water quality deterioration.	Action not taken; Sensitive area workgroup (SAW) was never created so these never moved forward.
Totten Inlet and Budd / Deschutes shall be considered by the recommended Sensitive Area Workgroup as possible Marine Recovery Areas.	Action not taken.
Summit Lake, which is used by most residents for their drinking water source, shall be designated as a Sensitive Area. All wastewater disposal systems in the Summit Lake watershed shall have required operational certificates and dye testing to assure that routine inspections and maintenance is completed at least every three years and failing systems are identified and repaired.	Action not taken.
Form a Sensitive Areas Workgroup (SAW) who will refine the criteria used to identify sensitive areas and apply the criteria to identify what should be designated as sensitive areas. Staff and resources may be needed to investigate problem areas, perform field evaluations and gather data to assist the workgroup with their task.	Action not taken.
(SAW) shall evaluate OSS-specific recommendations from the Budd Inlet/Deschutes River TMDL, Scatter Creek Aquifer, Urban Septic Assessment projects using the criteria they adopt. The SAW, as appropriate, will recommend sensitive areas and requirements to be included in plan amendments. [These three projects are underway with their own designated stakeholder committees and work groups, but will not be complete until after	There is no SAW; Action not taken.

2016 OSS Management Plan Recommendations	Status
the work of the OSS Management Plan advisory committee is complete.]	
The department shall have an education program that reaches a wide variety of audiences, including on-site industry professionals, the real estate community, OSS owners, the public and other affected parties, especially when there are changes in regulations, permitting, county processes and OSS technology. The department shall find opportunities to collaborate with on-site industry professionals, while being careful to keep the lines between the regulatory agency and the industry clear.	There are educational resources available on the Thurston County website, including brochures and videos;[4] "Septic Sense" workshops are available as well – county-wide.[5]

Stakeholder Engagement

In addition to reviewing the 2016 OSS Management Plan, the research team led an outreach effort to gather input from key players in the OSS management field. The research team engaged with key stakeholders to help shape the recommended actions in the updated OSS Management Plan. These stakeholders included OSS professionals specializing in inspection, repair, installation, and design, as well as local realtors, shellfish groups, tribal representatives, state agency staff, and other county personnel. A full list of interviewees and their affiliated organizations is provided in Appendix A. These conversations helped the team identify areas with water quality concerns, inefficiencies in OSS-related maintenance programs and processes, and opportunities to improve overall OSS management.

1.2. State OSS Regulations

In 2005, the Washington State Board of Health adopted Chapter 246-272A WAC. This chapter required all Puget Sound counties to develop a management plan for OSS within their boundaries. It lays out a management approach with shared responsibilities for both OSS owners and local health jurisdictions. In 2006, the state legislature implemented RCW 7~~9.118A~~0A.110, requiring counties bordering Puget Sound to designate Marine Recovery Areas (MRAs) where OSS contribute to the degradation of marine water quality. It also states that management strategies must be developed to find and repair existing failing OSS as well as to catalogue all OSS and ensure routine inspections.

In January of 2024, the Washington State Board of Health updated Chapter 246-272A WAC. Most of the new regulations established during the update became effective on April 1, 2025, except for the Maintenance Service Provider approval requirement, which became effective on February 1, 2025, and the Property Transfer Inspection requirement, which becomes effective on February 1, 2027.

The Washington State Department of Health (DOH) developed guidance documents to facilitate compliance with OSS Management Plan regulations back in 2007 and again in 2016. DOH is in the process of updating this guidance to reflect the WAC updates made in 2024. Although the updated guidance has yet to be released, the research team worked directly with OSS Technical Assistance Staff

[4] Thurston County, 2024, Care & Maintenance of Your Septic System. Available here
[5] Thurston County, 2024, FREE Septic Sense Workshop. Available here

at DOH to ensure the updated Thurston County OSS Management Plan aligns with forthcoming guidance. The following is a summary of the updates made to Chapter 246-272A WAC. For more information on state OSS regulations and state guidance documents, please refer to Appendix B.

WAC 246-272A-0015 requires the management plan to consider more areas where OSS could pose an increased public health risk compared to the original regulation. In addition to shellfish protection districts or growing areas, sole source aquifers, designated wellhead protection areas for Group A public water systems, areas where nitrogen has been identified as a contaminant of concern, and other areas designated by the local health officer, the updated code requires the county to also consider the following:

- Areas where aquifers are used for potable water;
- Up-gradient areas influenced by water recreation facilities designed for swimming in natural waters;
- Special protection areas;
- Wetland areas under production of crops;
- Frequently flooded areas;
- Areas where phosphorous is a contaminant of concern; and
- Areas where sea level rise may impact horizontal separations to surface water.

The updated chapter requires management plans to be updated at least once every five years. Previously, there was no requirement for how often management plans should be updated.

This chapter no longer specifies how a local board of health would apply for departmental approval of local regulations. The procedure was not included in the updated version of the chapter. Also excluded from the updated version are the details regarding adopting regulations, including what happens when the department denies approval of local regulations.

In addition, the updated version of this chapter requires the department to maintain and update guidance and to provide technical assistance to local health jurisdictions in the development of OSS Management Plans.

The code still requires OSS Management Plans to identify the operation and maintenance requirements for OSS commensurate with their public health risks; facilitate education of homeowners regarding their responsibilities to monitor and maintain their OSS; remind and encourage homeowners to complete and document the operation and maintenance inspections required by state law; enforce OSS owner permit application, operation, monitoring and maintenance and failure repair requirements of state law; describe the capacity of the local health jurisdiction to adequately fund the OSS plan; and assure the OSS plan was developed in coordination with the comprehensive land use plans of the entities governing development in the health officer's jurisdiction.

WAC 246-272A-0270 now requires OSS owners to obtain an inspection at the time of property transfer, beginning February 1, 2027. An inspection of proprietary treatment products is also required beginning February 1, 2027. These inspections can be waived by the local health officer if the OSS is up to date on inspections; there must be an inspection within the last three years for sewage tank or gravity subsurface soil absorption systems (SSAS), and for all other OSS types there must be an inspection within the last year. Additionally, with the update, a person shall not use any remediation process unless approved by the local health officer.

The code still requires OSS owners to operate and maintain OSS as directed by local health officers; obtain approval before repairing, altering, or expanding the OSS; renew required maintenance contracts; renew required operational certificates; inspect gravity systems every three years and all other systems annually; pump tanks when necessary; complete maintenance and needed repairs; and provide OSS maintenance records at time of property transfer.

Other notable updates include the introduction and use of the new term "Minor Repair" to clarify that some repairs do not require permits. In addition, local health officers must allow for the least expensive repair or replacement of an OSS that meets rule requirements and not impose more stringent practices on private entities compared to public entities. Minimum lots size and minimum usable land area for OSS were both also increased.[6, 7]

In addition to state regulations, Thurston County recently updated Article IV, Rules and Regulations of the Thurston County Board of Health Governing Treatment and Dispersal of Sewage.[8] The article specifies how sewage should be managed across the county to protect public health. It also establishes county-specific regulations of OSS that meet state requirements.

1.3. Thurston County Public Health Responsibilities

Thurston County Environmental Health Division has the responsibility to manage an estimated 55,400 OSS. Strategies to manage OSS in MRAs and other areas that pose the greatest public health risk must coordinate with programs for OSS in the remainder of the county. To meet these responsibilities, Thurston County Environmental Health Division must:

- Protect the public's health from disease caused by improper siting, construction, operation and maintenance, failure, or abandonment of OSS.
- Uphold state law that regulates OSS siting, design, permitting, building, operation, maintenance, and abandonment.
- Determine what specific public health and water quality risks the county has from OSS and adopt Sanitary Code regulations that will manage those risks.
- Develop an OSS program that is effective, fair, and as efficient as possible so that staff can focus their expertise and efforts on proper siting, design, permitting and installation, as well as working with owners of existing OSS that have operation and maintenance issues.
- Communicate and coordinate with state agencies and local jurisdictions on wastewater issues that affect and impact the citizens of Thurston County.
- Maintain a working relationship and meet regularly with septic professionals to clarify new requirements, listen to concerns, and resolve problems.

[6] Washington State Department of Health. 2024. Summary of Key Rule Changes: On-Site Sewage Systems Chapter 246-272A WAC. February. Available here.
[7] King County. 2024. Septic System Code Revision Newsletter – Changes to Statewide OSS Codes. March. Available here.
[8] Thurston County Environmental Health Division Public Health and Social Services Department. 2025. Article IV – Rules and Regulations of the Thurston County Board of Health Governing Treatment and Dispersal of Sewage. April. Available here.

- Provide OSS owners (current and prospective) with information and education opportunities of how to properly operate and maintain their OSS in order to meet their legal responsibility, extend the life of their OSS, protect the health of the community, and protect their investment.
- Confirm that at time of property transfer, the OSS has been inspected.
- Adapt to new information about OSS systems, community wastewater issues, water quality issues, and coordination opportunities.
- Implement a funding strategy that supports a comprehensive OSS program that meets the primary goal of the Health Department to protect the public health and the Thurston Thrives Environment strategy to keep water clean and restore water resources.

Thurston County upholds these responsibilities by providing guidance and education on their Septic System webpage, providing OSS management for non-gravity OSS and OSS located in sensitive areas via their operation and maintenance (O&M) Program, ensuring OSS are inspected as needed through their Time of Transfer program, and establishing a funding strategy described in this OSS Management Plan.

2. Recommendations

The 2025 Thurston County OSS Management Plan is a revised and updated version of the 2016 Thurston County OSS Management Plan. The recommendations proposed to the Thurston County Board of Health build upon those made in 2016 and incorporate input from a broad range of stakeholders, including industry professionals, shellfish advocates, tribal representatives, and realtors. These recommendations aim to address concerns and inefficiencies identified through this input. While not every suggestion led to a direct recommendation, the plan reflects feasible solutions and commonly shared priorities. For example, the importance of public education and maintaining water quality in Thurston County's inlets emerged repeatedly during the outreach for this update and is echoed in the recommendations related to MRA designation and proactive education and outreach efforts. Some industry professionals also raised concerns about the lack of consistency in regulations, certifications, and reporting requirements across Puget Sound counties, expressing a desire for regional standardization. However, due to variations in county geography and OSS management programs, code enforcement mechanisms, the absence of a state certification process, and the limited scope of this plan, those suggestions were acknowledged but not included in the final set of recommendations.

Many of the recommendations also stem from input received from several key Thurston County staff, including OSS permitting O&M, and water quality team members, hydrogeologist, Environmental Health Division Director and Community Planning Manager. They identified OSS-related challenges that should be addressed, efficiencies that should be continued, and shared updated water quality and septic system data. This information and the recently updated state OSS regulations were important pieces used to craft the following recommendations.

The recommendations are divided into seven sections:

- Septic to Sewer Planning
- Designation of Sensitive Areas and Marine Recovery Areas
- Database and Dashboards
- Climate change Planning
- Quality Assurance Control
- County Led OSS-related Programs
- OSS Local Management Plan Funding Strategies

Each section is prefaced with the requirements of applicable county and state law followed by a research team review, assessment of what is needed, and, finally, the recommended actions.

2.1. Septic to Sewer Planning

Conversion from septic to sewer in urban areas is a collaborative effort involving multiple jurisdictions, including the cities of Lacey, Olympia, ~~and~~ Tumwater, and other smaller jurisdictions as well as the surrounding Urban Growth Areas (UGAs). Many neighborhoods in these regions were originally built with septic systems before modern standards for lot size and OSS treatment were established. As a result, OSS in many areas are likely contributing to significant pollution of groundwater and surface water. For these communities, reliable and affordable OSS solutions are lacking. Connecting to the public sewer system is the most effective way to protect public health and align with the cities' long-

term sewer infrastructure plans. Key concerns include nitrate contamination of groundwater, sewage surfacing in neighborhoods during wet winter months, properties without space to repair failing systems, and the high costs associated with extending sewer service.

State and County Regulations

WAC 246-272A-0025 establishes that upon failure of an existing OSS within the service area of a sewer utility, the local health official shall:

- "Require connection to a public sewer system if the sewer utility allows the connection and has adequate public sewer services available within 200 feet from where the existing building drain connects to the existing building sewer, or where no building drain exists, within 200 feet from where the sewer line begins, as measured along the usual or most feasible route of access."

The intent of this regulation is to increase the number of parcels on sewer within urban areas as many of these lots are small and less conducive for OSS compared to their rural counterparts.

Thurston County Code Article IV amends and expands upon the 200-foot proximity stipulation of septic to sewer planning regulation outlined in WAC 246-272A-0025, wherein:

- "Any property served by an OSS shall be connected to a public sewer system when the public sewer system is available within 200 feet of the property line and the following conditions are met:
  - a. The public sewer system has the capacity to handle additional sewage; and
  - b. The public sewer lines are designed to accommodate the connection of building sewers; and
  - c. The connection is consistent with the Thurston County Sewerage General Plan and municipal comprehensive sewerage plans; and
  - d. Such connection is permitted by the sewer utility; and
  - e. The Health Officer determines the connection is necessary to protect surface water, ground water, or otherwise protect public health. This determination of necessity will be based on aquifer vulnerability, water quality correction and water contamination prevention information.

Research Team Review

The current approach to septic conversions depends on the interest of septic owners. Existing connection requirements are tied to a narrow definition of OSS failure for those within 200 feet of a sewer mainline. However, even those within 200 feet of a sewer mainline can be granted exemption from conversion to sewer if the cost of connection is higher than replacing their OSS, which it usually is. While sewer is not inherently better than septic when it comes to wastewater management, it often outperforms septic in urban areas. Parcels are typically much smaller in urban areas compared to those in rural areas and may have less room or poor soil for a drainfield. In urban areas there is also greater potential for conflict with underground utilities, including stormwater infiltration best management practices. Sewer is often much more accessible within urban areas due to the Growth Management Act (GMA) which prioritizes sewer and other urban services within UGAs.

In 2015, a regional septic work group and others developed an Urban Septic Assessment Report for Thurston County.[9] According to the report, there are 12,400 OSS in UGAs within unincorporated Thurston County. The authors of the report reviewed several septic to sewer programs to better understand the elements that make up a successful program and used this information to develop several septic sewer program alternatives that could be used in Thurston County to identify priority areas in UGAs within unincorporated Thurston County for conversion from septic to sewer and help reduce conversion costs for homeowners. The report includes a low, medium, and high effort septic to sewer conversion program.

The low effort program would dedicate modest staff and funding in each jurisdiction to plan and support septic to sewer conversion, focusing on incremental, voluntary connections. Conversion efforts would begin shifting toward a proactive approach in which some progress could be made in addressing some of the highest priority areas identified for conversion. This program would result in approximately 40 conversions per year, which is significantly more than the 10 conversions per year average recorded in 2015. The middle effort program assumes the elements of the low effort program are in place and includes additional regulatory changes to increase the rate of conversion (90 conversions per year) and requires more public funding for sewer line extension. The high effort program assumes the elements of the low and medium effort programs are in place and establishes dedicated fees to support a regional conversion program through which sewer line extension is publicly funded.

The county also has a Sewerage General Plan that was last updated in 1990. The 1990 Sewerage General Plan is specific to the unincorporated UGAs, which is managed by the c~~C~~ounty. It includes hook-up requirement recommendations, how transitions from septic to sewer should be handled, when and where interceptors should be constructed, and cost and payment principles. The guidelines in this document take precedence over city plans for unincorporated areas of Thurston County within the UGA.

While the county has an Urban Septic Assessment Report with septic to sewer conversion program alternatives, none have been implemented consistently across the county. Without a program in place, the county cannot effectively prioritize neighborhoods or parcels that are well suited for conversion from septic to sewer, whether that be through a sewer mainline extension project or connection to an existing mainline. These projects are costly and require significant planning and buy-in from OSS parcel owners. Gathering funding to reduce sewer project costs and securing community support can be challenging, especially when there is no clear purpose behind the project. A program that clearly outlines priority area criteria and establishes partnerships between city and county local health jurisdiction could help clarify when, why, where and how septic to sewer conversion should be conducted across the county.

Recommended Actions

Institute the Low Conversion Alternative from the 2015 Urban Septic Assessment Report

The research team recommends the county and cities work together to institute and follow through on one of the three alternative plans laid out in the Urban Septic Assessment Report. Due to funding and staffing requirements, the low alternative is most realistic. ~~and~~ It will allow the county and partners to establish protocols and a process for identifying priority areas in the UGA for conversion, develop strategies to reduce conversion costs for homeowners, and then convert~~ing~~ these priority areas to

[9] Regional Septic Work Group, Law Office of Kathleen Callison, and FCS GROUP. 2015. Urban Septic Report. March.

sewer. This program could then be expanded in the future to match the medium or high alternative presented in the report. It should be noted that a septic to sewer program would also require public outreach, education, financial incentives, and funding pursual.

Update 1990 Sewerage General Plan

The 1990 Sewerage General Plan should be updated to reflect current county hook up requirements and align with the county's plan for septic to sewer conversion in the UGA. This will ensure that all entities within the county are on the same page for converting septic to sewer and have clear guidance on how and when these conversions should occur.

2.2. Designation of Sensitive Areas and Marine Recovery Areas

Thurston County is heavily reliant on its many marine inlets, rivers, streams, lakes, and groundwater. These water systems support critical industries such as shellfish, provide potable water, offer recreational opportunities, and are key components of local ecosystems. As such, it is important to think about how septic systems impact both surface and ground water in Thurston County and the functionality of stormwater infiltration best management practices.

State and County Regulations

WAC 246-272A-0015 requires jurisdictions to identify areas where OSS could pose an increased risk to public health, giving priority to:

- "Shellfish protection districts or shellfish growing areas;
- Sole source aquifers as designated by the EPA;
- Areas in which aquifers are used for potable water and are critically impacted by recharge;
- Designated wellhead protection areas in Group A public water supplies;
- Up-gradient areas directly influencing water recreation facilities designated for swimming in natural waters with artificial boundaries within the waters;
- Areas designated as special protection areas;
- Wetland areas under production of crops for human consumption;
- Frequently flooded areas including areas delineated by the Federal Emergency Management Agency or as designated under the Washington State Growth Management Act;
- Areas where nitrogen has been identified as a contaminant of concern including, but not limited to, the marine waters of Puget Sound;
- Areas where phosphorous has been identified as a contaminant of concern;
- Areas where sea level rise may impact adequate horizontal separations to surface water (See Section 2.4: Climate Change Planning); and
- Other areas designated by the local health officer."

RCW 70.110.040 created MRAs where additional OSS requirements may be needed to minimize OSS impacts on the receiving waters. The intent is to:

- Enhance local OSS programs in MRAs by inventorying OSS, requiring the inspection of OSS, repairing failing OSS, developing electronic data systems capable of sharing information

regarding OSS and monitoring these programs to ensure that they are working to protect public health and Puget Sound water quality.

- The law requires the jurisdiction to establish an MRA where OSS are a significant factor contributing to concerns associated with:
  - Shellfish growing areas that have been threatened or downgraded;
  - Marine waters that are listed on the 303(d) list for exceeding federal Clean Water Act standards for low-dissolved oxygen or fecal coliform bacteria; or
  - Marine waters where nitrogen has been identified as a contaminant of concern.

The goal of these regulations is to identify both existing and potential areas where OSS may pose a public health risk, allowing for appropriate mitigation efforts. The underlined areas were added during the 2025 update and are newly required considerations. Additionally, local health jurisdictions are expected to coordinate their activities and share information with other county departments, local jurisdictions, and government agencies.

Research Team Review

The following is some background and context regarding the water bodies and systems that can be found in Thurston County.

Watersheds: Thurston County lies within four major drainage basins, also known as watersheds, which the state designates as Water Resource Inventory Areas (WRIAs). The largest, WRIA 22/23, covers the county's southwestern region and includes the Black, Skookum chuck, and Chehalis rivers, all of which ultimately flow to the Pacific Ocean. WRIA 13, which encompasses the Deschutes River, drains the central part of the county; the river passes through Capitol Lake before entering Puget Sound. Along the eastern edge of the county is WRIA 11, a narrower area drained by the Nisqually River, which flows into the Nisqually Reach of Puget Sound. In the southeast, WRIA 14, also known as the Kennedy-Goldsborough Watershed, includes creeks such as Woodland, Kennedy, Woodard, Green Cove, Perry, and McLane, which drain directly into Puget Sound.

Shellfish Protection Districts and Growing Areas: The county’s water resources include four marine inlets and the Nisqually Reach. The inlets are Budd, Eld, Henderson, and Totten. Nisqually Reach and Henderson Inlet are both designated MRAs and shellfish protection districts. Budd Inlet, Dana Passage, Eld Inlet, Henderson Inlet, Nisqually Reach, and Totten Inlet are all shellfish growing areas.

Aquifers: The soil in Thurston County is generally gently sloped and rich in clay, which helps rainwater seep into underground aquifers; the natural formations of rock, sand, or gravel that can store groundwater. These aquifers differ significantly throughout the county, with four major ones located in the northern and southeastern regions. They are layered vertically and are separated by clay-rich strata that helps retain water. McAllister and Allison springs originate from these aquifers and are key sources for the public water supply in the northern part of the county. Groundwater also supplies all water used by industry and agriculture, except for minor surface withdrawals. During dry seasons, groundwater sustains stream flows essential for fish, aquatic life, and wildlife.

In contrast, southwestern Thurston County primarily relies on a single, shallow aquifer, the Scatter Creek Aquifer. Lacking the protective clay layers, this aquifer is more vulnerable to contamination. The Scatter Creek Aquifer is an example of urban density and septic challenges. This aquifer is a shallow, unconfined, and extremely vulnerable groundwater supply and is the sole source of drinking water for more than

18,000 area residents. The aquifer flows from Tenino westward to Grand Mound and Rochester, and then south to Lewis County. Past sewage disposal practices and land use activities have resulted in elevated levels of nitrate and fecal coliform, violations of drinking water standards, increased public health risks, and water quality degradation. According to the Nitrate Loading from OSS to Groundwater analysis[10] done by the county in 2022, there are several nitrate hotspots in the Scatter Creek Aquifer that exceed both county and federal safe drinking water contaminant levels (4.0mg/L and 10.0 mg/L respectively).

To help safeguard drinking water sources, Thurston County designates certain areas as Critical Aquifer Recharge Areas (CARAs) and/or Wellhead Protection Areas. CARAs are locations that sit above important groundwater resources and are especially vulnerable to contamination from pollutants released at the surface or in the shallow subsurface, such as leaking underground fuel tanks, landfills, or fe~~r~~rtilizer and pesticide use on golf courses. These vital groundwater resources include those supplying public water systems and designated sole-source aquifers. The county maps CARAs using data on soil characteristics, geology, groundwater depth, and the location of known aquifers and active groundwater supplies. CARAs are classified into three categories (numbered I, II, and III based on their sensitivity to contamination, with Category I being the most critical (dark purple in Figure 1) and Category III the least (light purple in Figure 1). Areas of the county that do not fall into any of the three classifications are thought to have low potential for contamination of groundwater and a low dependence on local groundwater.[11]

[10] Hansen, Kevin. 2022. Draft-Final Water Resources Technical Memo 62: Nitrate Loading from OSS/Septic Systems to Groundwater. April.

[11] Thurston County Environmental Health Division. Aquifer Recharge Areas. Available here.

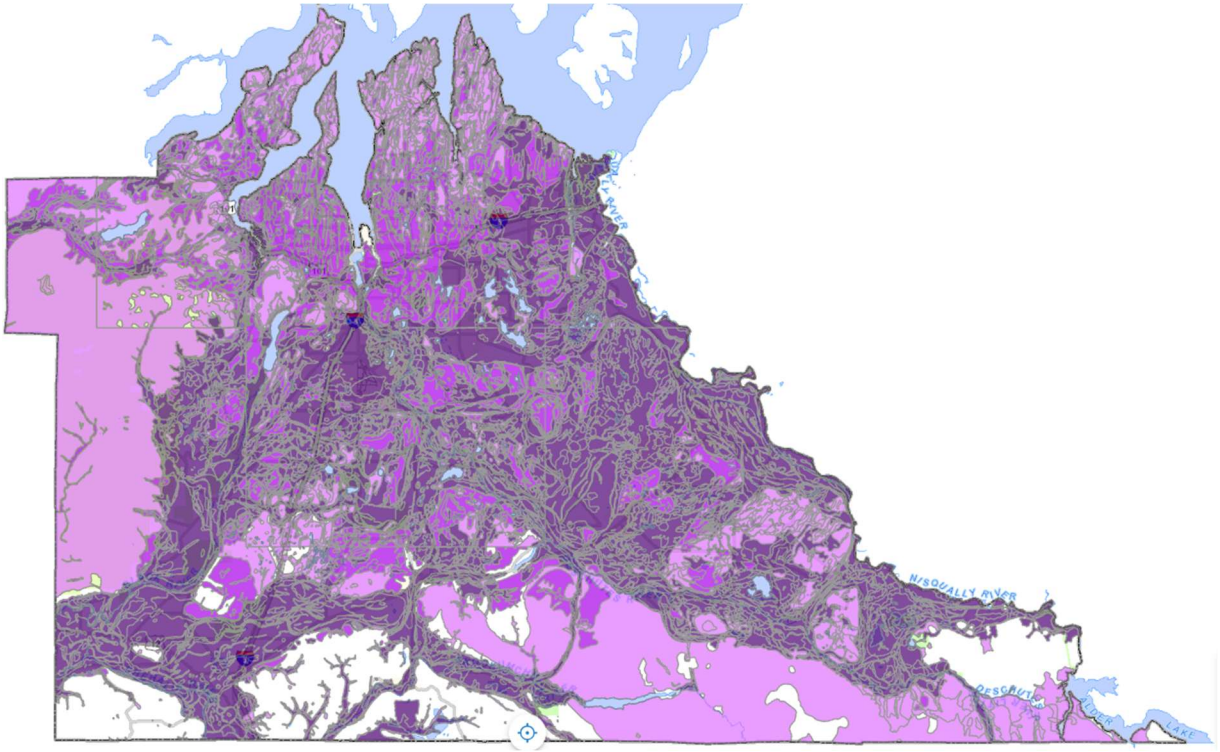

Figure 1. Thurston County Critical Aquifer Recharge Areas

Water Recreation: The county is also home to 108 lakes totaling approximately 6,343 acres. Alder Lake is a 2,930-acre reservoir on the Nisqually River that covers Pierce, Thurston, and Lewis counties. It is the largest lake in the county, with nearly 1,117 acres in Thurston County's borders. Black Lake, which spans 576 acres, is the county's largest natural lake. In addition to Black and Alder lakes, many other lakes in the county are used for recreational swimming including Summit Lake, Lawrence Lake, Long Lake, and Clear Lake to name a few.

Flooding: Thurston County's coastal setting, numerous waterways, and varied terrain make flooding one of its most significant and costly natural hazards. Approximately 51.25 square miles or about eight percent of the county's unincorporated area lies within 100-year floodplains. This implies that these areas have a one percent chance of flooding in any given year. According to FEMA, between 1962 and 2023, the county experienced 29 federal major disaster declarations related to flooding.

Areas where Nitrogen and Phosphorous have been Identified as Contaminants of Concern: the research team examined Total Phosphorous (TP) and Total Nitrogen (TN) over several years for seven different water bodies/waterways: Scatter Creek, Deschutes River, Totten Inlet, Eld Inlet, Summit Lake, Henderson Inlet, and Nisqually Reach. The county collects data for several more lakes and waterways, but the research team focused on these seven due to their MRA status, concern for these regions brought up in the 2016 Thurston County OSS Management Plan, or the recently mentioned water quality concerns in said area. Appendix C includes graphs depicting TN and TP for the seven waterways, as well as a brief description of the waterways and their uses. Based on the water quality analysis detailed in Appendix C, nitrogen and phosphorus concentrations are at concerning levels for both MRAs, while TP is an issue for both Eld Inlet and the Deschutes River.

Summary

As stated in the state regulations, the intent of this element of the OSS Management Plan is two-fold: 1) identification of sensitive areas (SA) where OSS pose an increased health risk; and 2) where those sensitive areas are marine areas, to designate these areas as Marine Recovery Areas. After identifying the priority areas listed under WAC 246-272A-0015, the team reviewed an extensive list of materials to determine where OSS could pose an increased risk to public health, focusing on these areas. These materials include:

- Thurston County Annual Water Resources Monitoring Reports
- Marine water sampling reports
- DOH shellfish growing area annual reports
- Scatter Creek Aquifer Groundwater Analysis
- Groundwater nitrate hot spot maps
- Thurston County Comprehensive Plan
- 303d List for Thurston County waterbodies (TMDL reports)

The priority areas identified in the state code encompass almost the entirety of Thurston County, mostly due to its reliance on groundwater, and numerous waterways and bodies of water. This is why it is so important for the O&M program to expand and provide stronger oversight for all OSS throughout the county (see section 2.6: County Led OSS-Related Programs for more details). In addition to more OSS management oversight, there were a few areas identified through the research that warrant particular attention. These are discussed below:

Shellfish Growing Area: In the Eld Inlet Annual Shellfish Growing Area Review for 2024,[12] DOH found that while Eld Inlet meets standards, it is threatened with a downgrade in classification due to instances of high fecal coliform at two sample sites. Eld Inlet also has elevated TP. Both fecal coliform and TP could be indicators of malfunctioning septic systems. Despite the county's enhanced O&M in Eld and a Pollution Identification and Correction (PIC) project in McLane Creek, almost 69 percent of OSS parcels in this region are not in compliance (see Figure 2). To protect its designation as a shellfish growing area, this area should be designated as an MRA.

[12] Washington State Department of Health. 2024. Eld Inlet Annual Shellfish Growing Area Review. December. Available here.

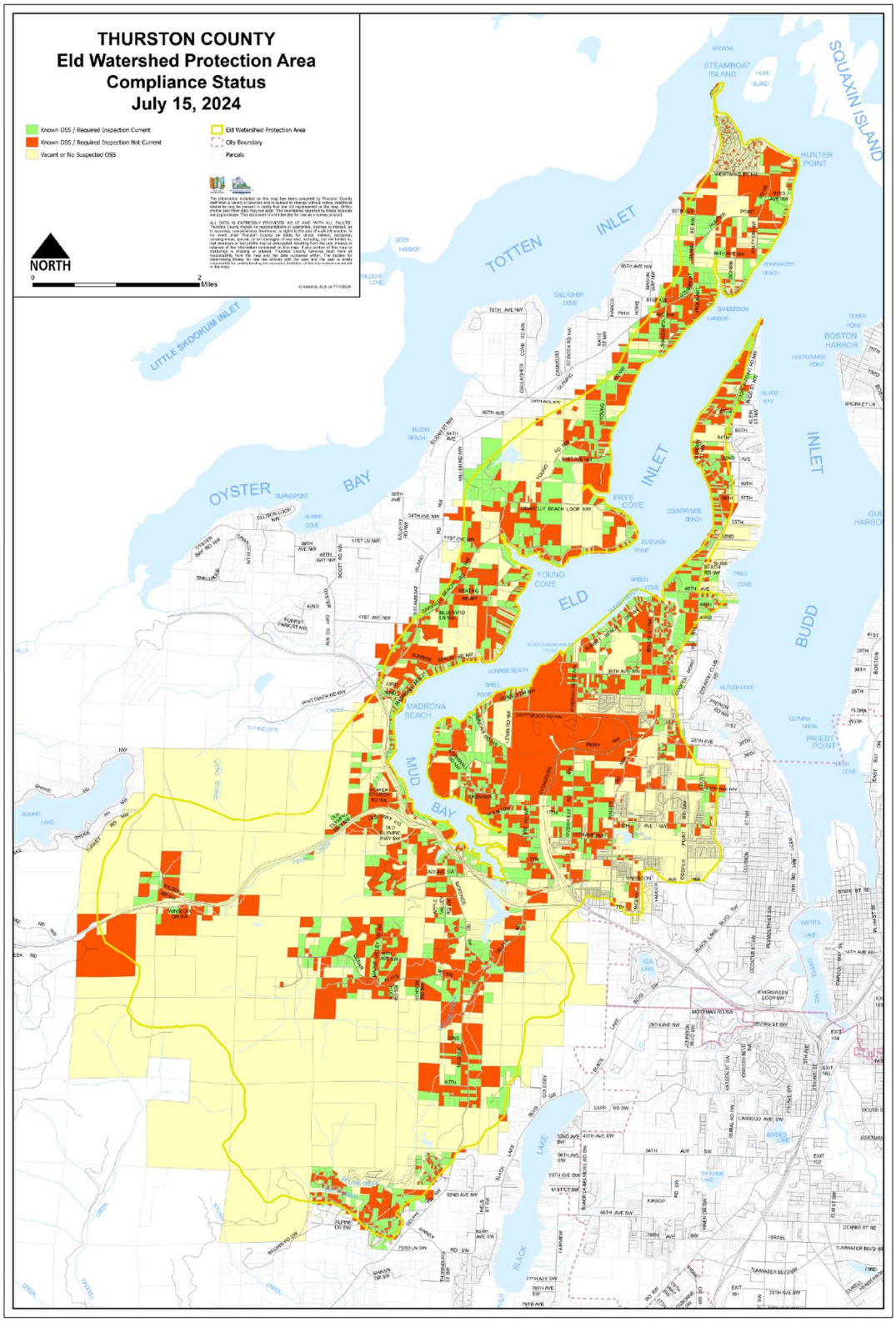

Figure 2. Eld Watershed Protection Area OSS Inspection Compliance Status

Vulnerable Aquifers: Scatter Creek Aquifer is the only sole source aquifer in Thurston County and is shallow and vulnerable to OSS pollution. The Nitrate Loading from OSS to Groundwater Analysis[13] points to numerous groundwater samples with elevated nitrate concentration within this aquifer. To reduce nutrient loading from densely populated OSS, development should be purposeful and consider OSS proximity and location relative to ground and surface water (see the recommendation: Scrutinize Proposed Development Close to Surface Water in Section 2.4) and monitor groundwater for spikes in nitrate concentration (see the recommendation: Water Quality Program in section 2.6).

Other Areas: Deschutes River Watershed feeds into Budd Inlet, a shellfish growing area, and includes numerous recreational swimming sites. The Deschutes River has elevated levels of phosphorus, which could be attributable to leaking OSS. Elevated phosphorous levels can lead to harmful algal blooms which, in turn, can lead to lake closures and halt shellfish harvesting. As shown in Figure 3, there are more OSS out of compliance than in compliance within this watershed. To address the low compliance rate (37 percent) and water quality issues in this watershed, we recommend the Deschutes River Watershed be listed as a Watershed Protection Area.

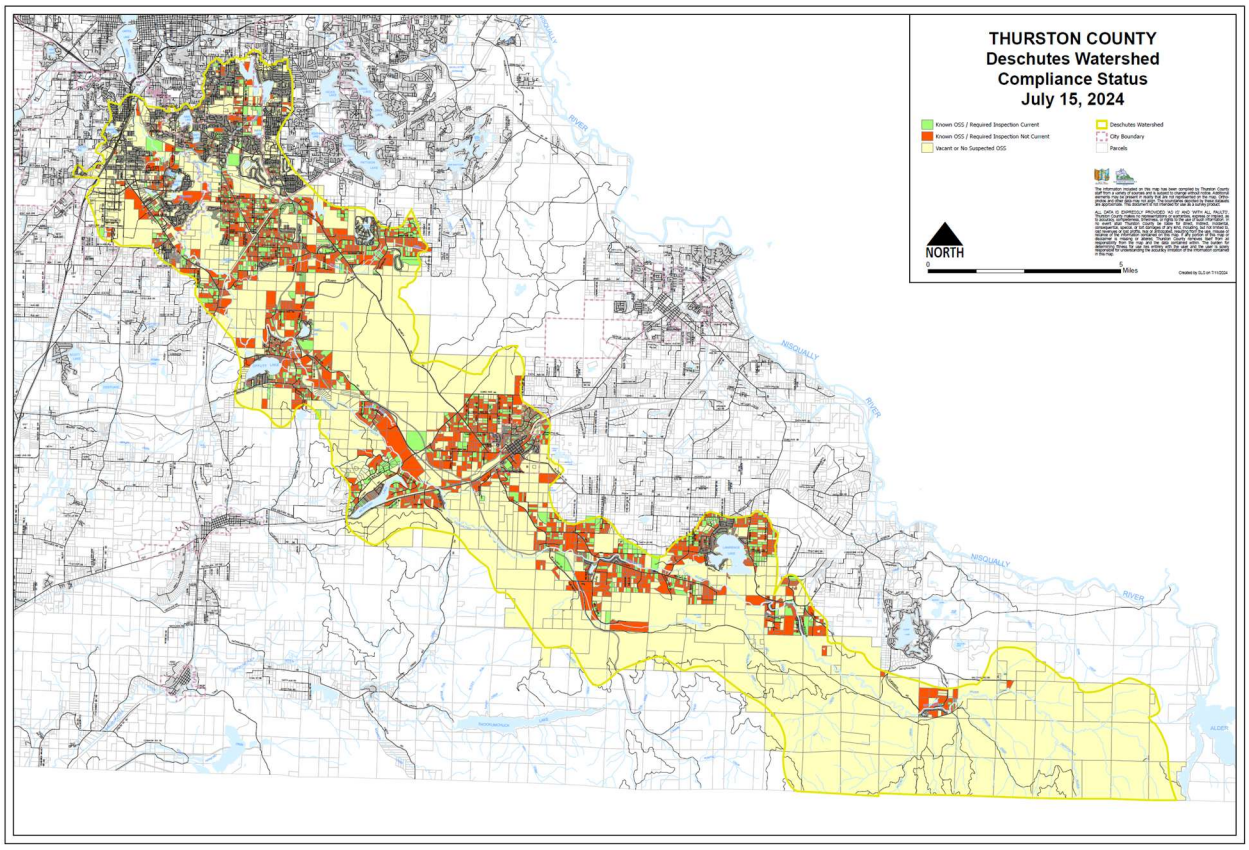

Figure 3. Deschutes Watershed OSS Inspection Compliance Status

While Summit Lake does not have a history of poor water quality, most residents use the lake water as their potable water source, and it is also used for recreational purposes. Its steep slopes, shallow soils,

[13] Hansen, Kevin. 2022. Draft-Final Water Resources Technical Memo 62: Nitrate Loading from OSS/Septic Systems to Groundwater. April.

and generally small lot sizes make siting and functioning of OSS around the lake difficult. Surface waters cannot be adequately protected from contamination to be safely used as a domestic water supply without treatment. Historically, it has been susceptible to harmful algal blooms. In 2017 and 2019 the Summit Lake experienced such severe green algae blooms that the water was not safe for consumption or recreation. For an extended period of time the county had to provide potable water to the lake shore community. A comprehensive O&M program would ensure routine inspection and maintenance of all OSS within the Summit Lake basin and identification and correction of failing systems that contribute to harmful algal blooms. If the O&M program is not expanded to cover the entire county, the Summit Lake area should be considered for special area designation due to the serious threat posed to the drinking water supply by failing septic systems.

Recommended Actions

Designate MRAs and Watershed Protection Districts

Eld Inlet should be designated as an MRA due to its threatened status as a shellfish growing area, elevated TP concentrations, and low OSS inspection compliance rate.

The Deschutes River Watershed should be listed as a Watershed Protection Area due to its elevated TP concentrations, swimming sites, and impact on Budd Inlet (a shellfish growing area).

Consider Designating as SA

Consider Summit Lake for designation as an SA because it is a sole source for potable water and has experienced significant harmful algal blooms in the recent past.

2.3. Database and Dashboards

Thurston County Environmental Health Division currently uses three database systems to manage and track OSS records, O&M program administration, and operation and maintenance work reported by OSS professionals: AMANDA, Online RME, and Microsoft Access.

State and County Regulations

WAC 246-272A-0015 requires local health jurisdictions to:

- "Progressively develop and maintain an inventory including the type and location of all known OSS in operation within the jurisdiction; and
- Maintain records required under this chapter, including all operation and maintenance activities as identified."

RCW 70A.110.060 has special requirements for local health officers within county MRAs, including to:

- "Require that on-site sewage disposal system maintenance specialists, septic tank pumpers, or others performing on-site sewage disposal system inspections submit reports or inspection results to the local health jurisdiction regarding any failing system; and
- Develop and maintain an electronic data system of all on-site sewage disposal systems within a marine recovery area to enable the local health jurisdiction to actively manage on-site sewage disposal systems. In assisting development of electronic data systems, the department shall work with local health jurisdictions with marine recovery areas and the on-site sewage disposal

system industry to develop common forms and protocols to facilitate sharing of data. A marine recovery area on-site sewage disposal electronic data system must be compatible with all on-site sewage disposal electronic data systems used throughout a local health jurisdiction."

The intent of these regulations is for the local jurisdiction to have an accurate and accessible record of all OSS within its jurisdiction, especially within sensitive areas, and to plan how to identify both unknown (not yet inventoried) and failing OSS.

Research Team Review

The county permit tracking system, AMANDA, is a relational database that integrates all permitting functions, i.e. building permits, land use applications, OSS permits, food service permits, complaints and property violations, etc. The database includes OSS permit records. An electronic OSS record is created for each system when permitted or when 'discovered' in the case of existing 'unknown' systems. Attached to that permit record, another record, Operational Permit Certificate (OPC), is created where inspection and maintenance information is tracked.

When the OSS Management Plan was last updated in 2016, there were 38,430 'known' OSS, i.e., a record of an existing septic system in the AMANDA database. As of 2025, there are 55,388 known OSS in the AMANDA database. The 'unknowns' becomes 'known' whenever:

- A parcel is transferred at a time of sale;
- A permitted repair is applied for;
- An inspection report is submitted;
- A building permit is reviewed; or
- A study area is inventoried.

Over the past two decades, Thurston County has continued to improve and enhance its OSS database systems. The goal has been to automate as many actions as possible to improve department efficiency. These efficiencies have been accomplished by:

- Transitioning from paper to electronic reporting – all septic professionals must file their reports electronically;
- Entering and correcting thousands of OSS records – Environmental Health Division staff has committed hundreds of hours to this task; and
- Hiring a full-time Business Applications Analyst in 2013 – to enhance the electronic database.

Professionals now enter all their reports electronically using the Online RME web-based application that also offers these professionals business tracking options. Realtors and property owners, current or prospective, can check O&M history and current reports. This web-based system electronically transfers the professional reports directly to the county, which are then managed by AMANDA. When no deficiencies are noted on the professional reports, renewable OPCs are issued and sent to the property owner. Therefore, staff sanitarians review only those reports with deficiencies to follow through with problems. The county has also enabled an online query for 'record drawings' and system information to assist pumpers and homeowners in finding septic tank and drainfield locations for doing routine inspections.

The O&M Program also uses a Microsoft Access database to administer the OPC renewal process. The automated process interfaces with AMANDA. All renewal notices, including notices that an OPC has been successfully renewed, are printed from this Microsoft Access database.

The last iteration of the OSS Management Plan identified the need for a public portal that allows permit applications, O&M records, and payments to be submitted electronically. The county is currently in the process of switching to a new permitting database, ACCELA, which will have a public portal that will allow people to renew their OPC and make OSS-related payments online. The new database is currently in development with an early 2026 implementation timeline.

The previous iteration of the plan also noted that a point-based OSS layer would increase information access and reduce identification errors. In 2016, the GIS department began developing a GIS layer using a unique identifier for each septic system. However, this layer was never completed. Currently, the county still uses a parcel-based layer that is updated two to four times a year for the OSS report to DOH. This polygon layer only includes parcel number and inspection status.

Recommended Actions

Develop a Point-Based OSS Layer

The research team recommends developing a point-based septic layer that includes the following attributes: inspection status, date of last inspection, system type, system age, proximity to surface water, and a link to the most current system design drawing and inspection report. The county started developing this layer over ten years ago, but an updating process was never formalized, and it has since gone unfinished. The existing schema/data does not include age, system type, or proximity to surface water. The geodata staff could revisit this layer, create an update process, and add in these additional attributes. This would require Environmental Health Division staff support and buy in to provide the information for these updates. With a finalized OSS point-based layer and update process, there are GIS tools that could be utilized. For example, the geodata team could create an online editing application for Environmental Health Division staff to be able to add the points and other information themselves. This layer could also be incorporated into dashboards for internal and external use.

Develop OSS Dashboard and Database

The research team recommends creating a comprehensive OSS dashboard that works with ACCELA and/or Online RME to routinely update. This dashboard could be used by parcel owners, as well as OSS professionals to easily access OSS information including septic system type, system age, date of last inspection, date of last pumping, and the most current OSS design drawing. Based on OSS type and date of last inspection, this system could also potentially feed into an automated inspection reminder system. The addition of topography and soil type layers along with UGA boundaries could also be helpful in determining where septic to sewer conversion should be prioritized. This tool would be useful for all stakeholders involved in OSS management.

In addition or in place of a spatial dashboard, Thurston County could create a dashboard focused on presenting OSS statistics on their website. They could take inspiration from the Kitsap County “Onsite Sewage by the Numbers” Tableau dashboard.[14] The dashboard includes the total number of septic systems (by type), percentage of systems with current inspection, average age of septic systems in the

[14] Kitsap Public Health District. 2025. Onsite Sewage By the Numbers. Available here.

county, and number of permits issued (new and repairs). It also includes some drinking water/well statistics. A dashboard like this is an easy way to share important information with the public in an easy to understand, visual format that also explains how and where Thurston County OSS fees are utilized. In addition, this dashboard could play a key role in educating county citizens about OSS and help the county keep track of key OSS metrics (see recommendation: Quality Assurance and Control in Section 2.6).

Link OSS Data to Water Quality Dashboard

The county is in the process of developing two stream and lake water quality dashboards; a public facing and a technical stream and lake water quality dashboard. These dashboards will be useful tools for sharing water quality information with both the general public, as well as with technical experts. This is a potential opportunity to also teach the public about the negative impact malfunctioning OSS, or highly concentrated OSS, can have on water quality. To do this, a new layer with OSS parcels could be added to the dashboard. This layer could be filtered by system age and OSS type to highlight potential links between OSS attributes and poor water quality. It would be important to add groundwater quality data to this dashboard, as well.

Creation of OSS StoryMap

The research team recommends the creation of a story map similar to the one used for the Black Lake Project.[15] In Thurston County, the main OSS related issue is their impact on water quality when they are not functioning properly. A story map depicting the improvement in water quality in Nisqually and Henderson through the OPC program, and other targeted projects could show the public how routine maintenance and upkeep of their OSS positively impacts water quality. The story map could also include maps highlighting areas of concern (Scatter Creek, Deschutes River, Eld Inlet, etc.). This could help the public understand why a change in fee structure or expansion of OPC program is necessary. This could partner well with the new water quality dashboard and future OSS dashboard.

2.4. Climate Change Planning

To comply with updated WAC requirements, the management plan must consider areas where sea level rise may impact OSS and result in increased risk to public health. There are other potential climate change factors, such as saltwater intrusion or increased severity and frequency in drought and rain events, that could impact OSS functionality throughout the county.

State and County Regulations

WAC 246-272A-0015 requires jurisdictions to identify areas where OSS could pose an increased risk to public health, including:

- "Areas where sea level rise may impact adequate horizontal separations to surface water."

The intent of this regulation is for local health jurisdictions to start planning for the impact of sea level rise on coastal OSS. The state also has several other climate change planning requirements for certain water systems (Group A) and for local government comprehensive plans.

[15] Thurston County. 2024. Black Lake Pollution Identification and Correction Project. Available here.

Research Team Review

There are many local planning documents that center around climate change or include climate change planning recommendations, such as:

- The 2020 Thurston County Comprehensive Plan (Chapter 9: Environment, Recreation, and Open Space)[16]
- The Thurston County Climate Adaptation Plan[17]
- The Olympia Sea Level Rise Response Plan[18]
- The New Projections of Changing Heavy Precipitation for Thurston County Report[19]
- Thurston County Hazard Mitigation Plan[20]
- Internal climate change water modeling

According to the Thurston County Hazard Mitigation Plan, communities in low lying areas, estuaries, and the inlets of Thurston County, including the Nisqually River Delta, will be subject to inundation under a six-inch sea level rise scenario. The entirety of the unincorporated Thurston County Puget Sound shoreline is in the sea level rise inundation area. Mud Bay and the Nisqually Delta will experience the greatest impacts.

[16] Thurston County. Adopted 2020. Thurston County Comprehensive Plan. December. Available here.
[17] Thurston regional Planning Council. 2018. Thurston Climate Adaptation Plan: Climate Resilience Actions for Thurston County and South Puget Sound. Available here.
[18] LOTT, Port of Olympia, City of Olympia, AECOM. 2019. Olympia Sea Level Rise Response Plan. March. Available here.
[19] Mauger, Won, and UW Climate Impacts Group. 2019. New Projections of Changing Heavy Precipitation for Thurston County. July. Available here.
[20] Thurston Regional Planning Council. 2023. Hazard Mitigation Plan. November. Available here.

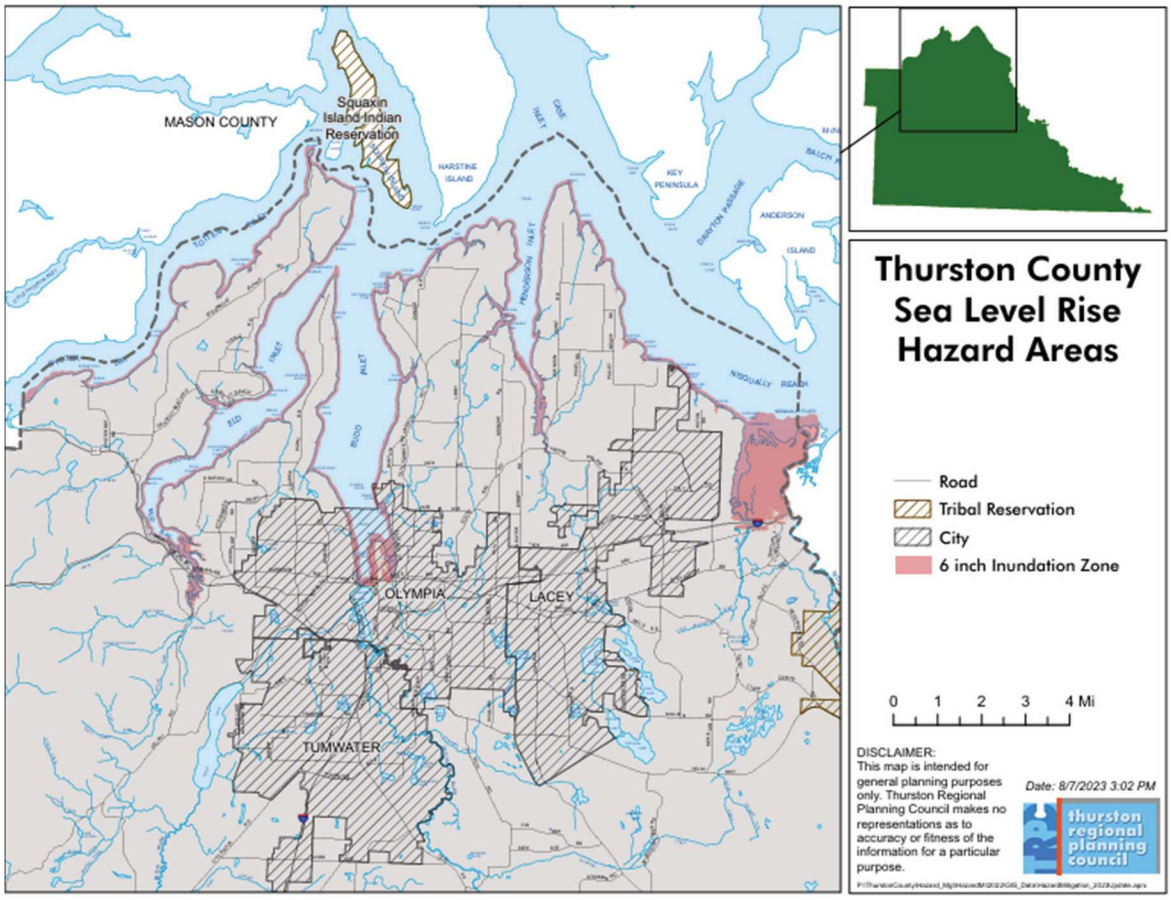

Figure 4. Thurston County Sea Level Rise Hazard Areas[21]

However, none of these documents specifically identify OSS that could be impacted by future climate change impacts such as sea level rise, saltwater intrusion, and heavy precipitation events. There are also no plans dictating how local health jurisdictions should manage OSS parcels to mitigate and adapt to climate change. Guidance would allow for a unified response across the county to specifically address relevant climate change impacts on OSS.

Recommended Actions

Develop a Climate Change Response Plan for OSS

Using the most current projected climate change information~~data~~ available (and, if possible, the same data used in other climate change response planning in the county listed above), the county should develop a climate change response plan specifically for OSS. This plan should build off existing local climate change work and planning but emphasize a plan for OSS parcels across the county. In addition to identifying climate change related impacts to OSS, the response plan should include steps the county can take to mitigate these impacts and adapt when necessary.

[21] Thurston Regional Planning Council. 2023. Hazard Mitigation Plan. November. Available here.

Research and Invest in Alternative Systems

As sea level rises, OSS may no longer be feasible for coastal parcels. The county should begin researching, investing in, and educating the public on available alternatives. For example, membrane bioreactors (MBR) can replace OSS. The MBRs remove nitrogen and make effluent water almost potable. These advanced treatment systems could be made available at the household level to replace OSS when they are no longer feasible due to climate change impacts or other factors. The MBRs and other alternate systems could also be beneficial on legacy small lot parcels that are still using OSS. It should be noted that residential MBRs are very expensive both in terms of initial purchase and ongoing maintenance. Any investment or subsidization of alternative systems should target homeowners in unique situations that preclude other septic management options (such as coastal properties or small legacy lots with poor soil drainage).

Scrutinize Proposed Development Close to Surface Waters

This recommendation aims to reduce nitrogen loading while helping the county plan thoughtfully for a future shaped by climate change. When the county rezones, it should take a detailed look at requests for higher density rural housing on all remaining undeveloped parcels that are stream and shoreline adjacent or at risk of high groundwater flooding. Development increases the waste burden on surface water. While most of the county does not use surface water for drinking (except those reliant on Summit Lake), many of the county's lakes and marine waters are used for recreational purposes, including swimming. The updated WAC requires management plans to consider areas influenced by water recreation facilities designed for swimming in natural waters. By minimizing dense development around shorelines, the waste burden in these areas will be less extreme and pose a lesser threat to these bodies of water in the future.

2.5. Quality Assurance Control

The last iteration of the OSS Management Plan included a recommendation for a robust Quality Assurance/Quality Control (QA/QC) program that prioritizes areas where inspection accuracy is most important for protection of public health and water quality. Due to staffing limitations caused by lack of funding, this program has not been implemented consistently over the past few years.

State and County Regulations

WAC 246-272A-0015 states that local health jurisdictions will:

- "Progressively develop and maintain an inventory including the type and location of all known OSS in operation within the jurisdiction;
- "Maintain records required under this chapter, including all operation and maintenance activities as identified; and
- "Enforce OSS owner permit application, operation, monitoring and maintenance and failure repair requirements."

The intent of these regulations is to ensure the county makes progress in both identifying OSS and increasing compliance.

Thurston County Code Article IV requires a certified septic professional to conduct an inspection at least once every 9 years in place of a self-inspection by the certified self-inspector.

Research Team Review

The most recent version of Thurston County Sewage Treatment and Dispersal Regulations, Article IV, mentions a QA/QC program. Specifically, it requires that local health officers investigate citizen complaints and monitor the performance of installers, pumpers, or monitoring specialists or firms through a quality assurance program.[22]

However, due to limited ~~staffing capacity~~funding, which limits staff capacity, there has not been a consistent quality assurance program on OSS inspections led by both homeowners and professionals. The majority, if not all, of county follow-ups are currently complaint driven, conducted at Time of Transfer (TOT), coincide with PIC efforts, or when an OSS is installed or majorly repaired. This means that less noticeable leaks or issues may go unattended due to poorly conducted inspections or reporting.

For interested homeowners, the county holds homeowner septic self-inspection workshops every two weeks. Homeowners with this certification can submit inspections without consultation with an OSS professional. To improve QA/QC of self-inspections, the county recently implemented a new rule that requires homeowners to get an inspection by an OSS professional at least once every nine years.

To supplement this new rule, an OSS inspection program should be developed with targeted goals and inspection metrics. This inspection program would also inform the county if there were OSS product issues that may need to be reported to DOH.

Recommended Actions

Implement a Robust QA/QC Program

The county should implement a QA/QC program that ensure routine reviews of a representative sample of inspections submitted by OSS owners and professionals (10 percent). The representative sample should prioritize areas of the county where inspection accuracy is most important for protection of public health and water quality, such as MRAs, SAs, and areas with shallow sole source aquifers.

Establish Metrics and Targets to Measure Success of QA/QC and other Programs

To ensure programs are working as intended, a system of metrics should be established and reported on every six months. Metrics and targets should be developed for all OSS-related programs and recommendations. For example, to increase inspection compliance, a target should be determined for compliance and then this metric should be tracked and shared on the County's dashboard. The county could also keep track of the number of inspection reminders sent out during the tracking period.

2.6. County Led OSS-Related Programs

The level of oversight and the OSS operation and maintenance requirements in Thurston County are determined by the complexity of the system and the level of public health risk posed if the system fails. Thurston County has many programs in place to monitor septic systems, ensure inspection compliance, and identify water quality issues potentially caused by leaking OSS.

[22] Thurston County Environmental Health Division. 2025. Article IV: Rules and Regulations of the Thurston County Board of Health Governing Treatment and Dispersal of Sewage. April. Available here.

State and County Regulations

WAC 246-272A-0015 requires that OSS Management Plans must specify how local health jurisdictions will:

- Identify operation, maintenance, and monitoring requirements commensurate with risks posed by OSS;
- Describe how the local health officer will remind and encourage homeowners to complete the O&M inspection;
- Enforce OSS owner permit application, operation, monitoring and maintenance; and failure repair requirements;
- Educate OSS owners about their responsibilities to perform OSS operation and maintenance, including information for owners to complete any inspections;
- Review and update the local management plan, as necessary, or at least once every five years.

WAC 246-272A-0270 establishes that:

- "At the time of property transfer obtain an inspection (beginning February 1, 2027) and provide to the buyer, all available OSS maintenance and repair records in addition to the completed seller disclosure statement."

The purpose of these regulations is to ensure local health jurisdictions have an effective OSS management process that minimizes public health impacts caused by malfunctioning OSS, particularly in sensitive areas.

Research Team Review

The OSS that pose elevated public health risks are monitored closely by the Environmental Health Division through a renewable operational certificate program. The OSS that fall outside of this program have comparatively minimal O&M oversight. Below is a description of county-led programs that relate to OSS management.

Operational Certificates and Requirements

The OPC program ensures that OSS with a higher risk of impacting public health due to complexity or location are closely monitored by the county. All OSS located in designated MRAs have renewable OPCs that receive a high level of oversight from county staff. In addition, all complex alternative types of OSS and community OSS are also required to have OPCs. The OPC establishes the monitoring and maintenance requirements for the particular OSS. Routine inspections and all needed maintenance and repairs must be done before the OPC can be renewed. Most OPCs have three-year renewal cycles, though some alternate systems have annual renewals. There is a combined total of 16,203 OSS in Thurston County that require renewable OPCs.

Thurston County has three active OPC programs:

- Henderson Watershed Protection Area/Marine Recovery Area – Implemented 2007
- Nisqually Reach Watershed Protection Area/Marine Recovery Area – Implemented 2013
- Large and complex OSS/County wide – Implemented June 1999

The OPCs are required for complex systems like mounds, sand filters, recirculating gravel filters, experimental and proprietary systems, aerobic treatment units (ATUs), drip dispersal systems, systems

with disinfection units, holding tanks, remediation measures, community systems (COSS), and food establishments. Larger on-site sewage systems (LOSS), with design flows greater than 3,500 gallons per day (gpd), are regulated by DOH and do not fall under the authority of the local health jurisdiction.

Of the 55,388 inventoried OSS in Thurston County, 39,185 do not require an OPC. These OSS are simple systems (gravity, pumped-to-gravity, and pressure distribution systems) that fall outside of MRA boundaries. The inspection frequency of thesese OSS are not actively monitored under the O&M program unless they are part of grant funded project or until or unless they are failing or have serious deficiencies reported to the county.

To renew an OPC, the OSS owner must ensure that routine inspections have been conducted, that all needed maintenance or repairs have been completed, and that their effluent has been sampled. The current fee for OPC renewal is $180 (the fee is $95 for senior or disabled property owners). The O&M program uses a Microsoft Access database to administer the OPC renewal process. The automated process interfaces with AMANDA.

In addition to requiring OPCs, designated high risk OSS within MRAs must have a dye test evaluation once every nine years. The dye test methodology as outlined in county policies and procedures is one way used to identify failing systems .

Henderson and Nisqually programs require high risk systems (those with close proximity to the shoreline or tributaries to Puget Sound, and restrictive soils) to undergo a dye test or parcel evaluation once every nine years. Approximately 65 dye tests are due every wet season for high-risk systems in MRAs. From 2016 to 2021, 12 OSS failed the dye test out of 427 tests (2.8 percent failure rate).

The county has been conducting dye tests since the early 1990s. The overall percentage of shoreline systems found failing through dye testing was historically 13 to 14 percent per year. This is the percentage seen during the first two years of the Henderson program in 2007 and 2008. However, that rate dropped to 2 to 4 percent per year from 2009 through 2021. The lower failure rate is due ongoing operation and maintenance requirements catching issues early and to the dye testing program. that was implemented in the MRA. Failures or minor issues were caught during the first few dye test seasons and replacements were made, which resulted in lower failure rates. Tracking this data may help determine if routine dye testing and physical inspections and maintenance are contributing to lower rates of OSS failure.

When an OSS fails a dye test:

- The owner is notified of the results;
- Diagnostics are often performed to determine the cause of failure;
- Notice of Violation is issued with a timeline to repair;
- The O&M staff tracks repair progress through the permitting process; and
- Enforcement actions are taken when needed.

Inspection Reminders

Oversight of the complex systems that require meeting a treatment standard is important because these systems are in highly sensitive areas and need to adhere to treatment standards. If not adequately treating sewage, disposal can pose a risk of fecal coliform or nutrient pollution to ground and surface water. Only 13 percent of OSS in MRAs are nonconforming and only 16 percent of OSS with an OPC outside of a MRA boundary are nonconforming. The OSS that require an OPC are sent inspection

reminders by the Environmental Health Division. It should be noted that the notification process is labor intensive since almost half of the owners need more than one notice.

While most OSS that require an OPC are conforming, some remain out of compliance/nonconforming. The reasons for monitored systems being nonconforming include: 1) no CMS contract, 2) sample results not meeting treatment standards, 3) not completing required OSS inspection to renew the OPC, and/or 4) not paying required fees.

When an OPC has not been renewed within 120 days, and no request has been granted for an extension, the OSS is automatically designated as a non-conforming system and is out of compliance with the county sanitary code. This designation is noted in the permit tracking system and can be seen by all permitting staff. ~~The county takes no formal action against the permit holder at this stage~~. To issue an OPC for a nonconforming system, the following is required:

- System inspection by a certified professional;
- Completion of any required repairs to the system; and
- Paying back renewal fees if in the countywide O&M Program.

The owner of a non-conforming OSS receives a written notice of the status and a reminder to bring it back into compliance at the time of the prescribed renewal due date, i.e., usually three years after the last due date. Eighty-six percent of OSS that require an OPC are compliant. The process to notify OSS owners of their non-conforming status was automated in 2010.

It is important to note that the compliance rate for OSS outside of the OPC program is much lower, at 45 percent. These OSS owners do not receive regular inspection reminders. When funding and staff are available, the county will send out inspection reminders to certain project areas. For example, watersheds with water quality issues have been targeted with reminders to help increase compliance in these regions. However, reminder notifications have varying degrees of success in increasing inspection rates. An example of this form of education and outreach was experienced during the Black Lake Pollution Identification and Correction Project. The Environmental Health Division sent out 667 letters reminding homeowners of inspection requirements. This notification increased the inspection rate by 13 percent (89 properties), and cost $3,300.

Enforcement

Enforcement occurs when the owner applies for permits or approval by the county. No permits can be issued for any activity on a parcel with a non-conforming OSS until the OSS is brought back into compliance. For high risk (mostly marine shoreline systems) within the MRAs, enforcement actions are taken to get compliance with inspection and dye test requirements. Appendix D contains more information on the county's enforcement steps and includes a case study for Black Lake enforcement.

For TOT reports, a non-conforming status is reported, which results in many OSS being brought back into compliance. The department has designated staff who take compliance action when high risk OSS within the MRAs fall into non-conforming status. The typical actions taken first include direct communication attempts to inform the owner and get voluntary action. If unsuccessful, it is followed by a Notice of Violation and can go on to civil penalties and court action if needed.

Pollution Identification and Correction Program

In addition to these enforcement mechanisms, Thurston County Public Health & Social Services developed the Pollution Identification and Correction (PIC) program to prioritize, assess, and investigate rivers, streams and marine shoreline areas that are experiencing elevated bacteria pollution. There are a multitude of possible pollution sources that can impact water quality with fecal bacteria being one of the leading pollution sources of concern. Nonpoint sources include agriculture and improperly managed livestock and pet waste. Point sources include failing OSS and illicit discharges from broken side sewer pipes and recreational vehicles.

Staff conduct "door-to-door" property inspections (sanitary surveys) to evaluate OSS maintenance and function, and animal waste management practices — both pets and livestock. When problems are found, they are corrected with targeted education and support for the landowner. If this approach is not successful, then staff proceed with enforcement as specified in the Sanitary Code (Article IV) for Thurston County.

Essentially the PIC program assesses fecal pollution of Thurston County surface waters; protects the public from waterborne illness related to fecal pollution of surface waters, storm water, and shellfish; and addresses or assists with federal, state, and county water quality mandates as required. Through investigatory work, the PIC team works to eliminate or mitigate contamination to waters of the county by following the process described below.

1. **Identification of High-Risk Areas**: Utilizing historical water quality data in combination with density and public use, the PIC Program concentrates on areas where substandard water quality is a high risk for Public Health.
2. **Investigatory Assessment:** In high-risk areas, records research, site visits, sampling, and investigatory practices are performed to characterize and discover pollution sources.
3. **Remediation:** Community engagement through partnership and education is the preferred method the PIC team employs. If needed, enforcement action is taken to ensure degradation of the waters of our county is corrected.

Repairs and Minor Repairs

Repair permits are taken out most often because an OSS is failing. From 2016 through 2024, repairs of systems outside the two MRAs have been approximately 2.8 percent (1,215 repair permits / 43,921 systems) of the total estimated number of systems. Within the Henderson and Nisqually MRA, 2.7 percent (303 repair permits / 11,467 systems) of the systems have been repaired. A total of 1,518 repair permits were issued for OSS from January 2016 to June 2024.

Minor repairs are those made to the OSS or OSS components that do not require a permit from the county. Minor repairs are significant because a failure to correct small system deficiencies and problems can cause an OSS to fail prematurely or cause improperly treated sewage to pollute ground or surface water resources. The Minor Repair definition from the Thurston County Sanitary Code states that the following are considered minor repairs:

- Building sewers;
- Any other portions of tightline in the OSS;
- Risers and riser lids;
- Sewage tank baffles;
- Effluent filters;
- Sewage tank pumps and lids;
- Pump control floats; and

- And OSS inspection boxes and ports.[23]

Though minor repairs do not require a permit, OSS located in MRAs require a written report to be submitted to the county stating the nature of the repair or replacement work. From January through June of 2024, 102 minor repairs were documented on 77 OSS in MRAs. In 2023, a total of 229 repairs were documented on 171 OSS, and in 2022 182 repairs were documented on 141 OSS. Tracking minor repairs allows the county to keep track of minor repairs in areas of special concern and track OSS with both major and minor deficiencies. This is an example of the Environmental Health Division's adaptive management and intentional oversight of OSS in areas that pose a high risk to impact public health.

Time of Transfer

The TOT has been in place since 2010 and has helped increase the distribution of OSS maintenance information. The program requires parcels with an OSS to get an inspection and have their system pumped before they can sell or transfer their property. Some exceptions can be made if an inspection and pumping or a new OSS installation was completed only a short while before the transfer was requested. A TOT application fee is $280, and resubmission fees are $90.[24] Any system deficiencies, including expired operational certificates, are reported to the applicant. In 2023, the county processed 1,545 TOT applications, while an additional 1,535 applications were processed in 2024.

Ground Water Quality Program

Virtually all the county's drinking water comes from ground water or aquifers through wells and springs. However, the county does not consistently collect groundwater samples. Current sampling is being done on a case-by-case basis and is mostly complaint or project driven. Under current regulations, wells serving one or two residences are sampled once at the time of construction. Most people do not request follow up sampling, although it is recommended that these wells are tested annually for coliform bacteria and every three years for nitrate chemicals. Though not required, most realtors will collect samples from wells at TOT. Most Thurston County water samples are collected at TOT.

Larger water systems require more consistent water quality monitoring. Group A Public Water Systems (community systems with 15 or more connections or those serving greater than 25 people per day for 60 days or more per year) must conduct at least monthly coliform bacteria sampling and test nitrate levels annually. Group A systems are managed and monitored by DOH. Group B Public Water systems (community systems with 3-14 connections that serve less than 25 people per day or serves more than 25 people per day during fewer than 60 days per year) must conduct annual coliform bacteria sampling and test nitrate levels every three years. Group B systems are managed by the Thurston County Environmental Health Division.

Education and Outreach

All OSS owners can access O&M information online and attend OSS workshops offered by the county. The county maintains a webpage that provides helpful OSS maintenance information and points OSS

[23] Thurston County Environmental Health Division. 2025. Article IV: Rule sand Regulations of the Thurston County Board of Health Governing Treatment and Dispersal of Sewage. April. Available here.

[24] Thurston County Environmental Health Division. 2025. Article 1 Appendix A – Environmental Health Fee Schedule. Available here.

owners to OSS professionals who are certified within the county. The county also offers a certification for OSS owners to conduct their own inspections.

Regardless of whether an OPC is or is not required, there are certain instances in which the county will distribute a list of requirements and recommendations on best practices for maintaining and operating an OSS. These instances include when:

- An initial OPC is issued for a new or repaired OSS;
- New O&M requirements are established for an existing OSS;
- Ownership of a property with an OSS is transferred;
- A postcard is sent to the owner to confirm that the required OPC for an existing OSS has been renewed, and they can contact the county if they would like an additional copy of the O&M requirements; or
- The TOT applicants receive the requirements (or recommendations for gravity and pressure distribution systems) for proper O&M of their septic system.

Financial Assistance

Incentives and financial assistance are integral pieces of Thurston County's O&M Program. Rebates, grants, and loans are available to various groups within the county. Each funding program has eligibility criteria.

Rebates for installing risers over septic components are available only to septic owners in the MRA/Shellfish Protection Districts. Rebates are $200 per riser installation. The program is administered by O&M Program staff. Riser rebates have been available to septic owners in Nisqually for the same number of years as in Henderson. A sharp increase in the number of Nisqually riser rebates coincided with development and adoption of the Nisqually O&M Program.

Small grants are offered to low-income septic owners throughout the county to help with the cost of inspections, maintenance, and minor repairs. These are available to owners enrolled in the senior/disabled property tax exemption program or to those who have an annual household income of $65,350 or less per year. Qualifying owners are eligible for a small grant once every three years to coincide with their inspection frequency. The rebates are funded by state and federal grant funds.

Summary

The primary goal of Thurston County's O&M Program is to protect public health. The program has been designed to meet the requirements of state law, the c~~C~~ounty's sanitary code, and the c~~C~~ounty's OSS Management Plan. Within the two MRAs and for alternative-type systems throughout the county, the O&M Program is effective at protecting public health from OSS-related concerns. Other programs, such as TOT, have furthered the goal of inventorying unknown systems and increasing inspections and maintenance on gravity and pressure distribution systems.

The Environmental Health Division has made great strides over the past decade by greatly increasing the number of OSS electronically inventoried, updating their OSS management software to allow for electronic submittal of OPC renewals and payments, and by providing heavy oversight on OSS in the OPC program (those that have a greater potential to impact public health.

Overall, the department is meeting its legal responsibilities as defined in state law with its current programs. The O&M program faces the challenge of ensuring that all 55,000 plus OSS within the county are being routinely inspected and maintained so that public health is protected, especially now that the state requires local health jurisdictions to identify several new areas where OSS can pose a threat to

public health. Below is a summary of the current O&M Program offerings and requirements (see Table 2).

Table 2. Summary of Current O&M Program Offerings and Requirements

	MRAs	Complex Septic Systems	Standard Septic Systems outside MRA (No OPC required)
# of Septic Systems	11,467 (~20%)	4,736 (~10%)	39,185 (~70%)
Required renewable operational certificate	Yes	Yes	No
O&M reminders by mail (3 notices)	Yes	Yes	No
Risk-based dye testing of systems	Yes	No	No
Follow up on reported deficiencies	Yes	Yes	Yes, using foundation public health funds
Follow up on reported failures	Yes	Yes	Yes
Self-inspection certification workshops	Yes -grant funded	Yes - grant funded	Yes, using foundation public health funds
Septic$ense workshops	Yes - grant funded	Yes - grant funded	Yes - grant funded
Riser rebates	Yes - grant funded	Yes - grant funded	Yes - grant funded
Small grants for maintenance – low income	Yes - grant funded	Yes - grant funded	Yes - grant funded
Low-interest loans for repairs or replacement- Public-Private Partnership	Yes	Yes	Yes
Rate of current inspections	87%	84%	35%
Funding Source	O&M program rates & charges collected on property tax	O&M renewal fees	Foundation public health funds

Recommended Actions

O&M Program

The O&M Program has been largely successful in its management of OSS in MRAs and complex systems throughout the county. These areas have higher compliance rates compared to those not managed under the O&M Program. To ensure the county addresses OSS in all the areas identified under the updated regulations, the O&M Program should be expanded to cover all OSS throughout the county. An expanded O&M Program would not involve the same level of oversight as the current OPC program. Rather, the county would evaluate and expansion or changes to its O&M notification mailing system, educational outreach efforts, and testing protocols to better serve the entirety of Thurston County. In

doing so, Thurston County would meet updated state requirements and improve public and environmental safety across the county, protecting vital surface and groundwater resources.

PIC Program

The PIC program is an effective program that follows up on non-OPC OSS deficiencies and identifies failing OSS. However, its effectiveness can be limited by local sustainable funding and staff resources~~funding and staffing restrictions~~. To ensure that high priority areas are appropriately surveyed and dye tested, the PIC program should be covered by OSS fees to ensure its consistent application moving forward.

Time of Transfer

Washington state code now requires an OSS inspection at the time of property transfer. Thurston County already has a TOT program that requires this. It is recommended that this program be continued so as to meet state requirements. The 2016 OSS Management Plan re~~c~~commends that the TOT program require all deficiencies be fixed before the parcel is transferred. This could result in the hold up of sale if deficiencies are found. However, after discussions with realtors and Thurston County staff, it seems that most realtors will not sell a house if the OSS is deficient. To maintain community support and avoid increasing administrative burden, the research team recommends continuing the program as currently structured.

Groundwater Quality Program

Due to the county's heavy reliance on groundwater and concern that background nitrate may exceed zoned development capacity for new OSS in some areas, the county should make their groundwater data collection more robust. The county should mine and collate existing data already being collected from Group A and Group B systems in addition to private single residence wells. The data consistently collected from Group A and Group B systems could be used to identify pressing groundwater quality issues and identify trends over time. These systems are also operating in populated areas where density could be negatively contributing to groundwater quality. Though single residence wells do not require a consistent water testing regimen, samples gathered during time of construction and TOT could complement the county's understanding of groundwater quality hotspots and trends. This program would not require additional groundwater testing, but would require the mining, collation, and updating of this data which will allow the county to identify and address groundwater quality issues as they arise.

If existing data identified gaps or areas of groundwater concern~~groundwater quality becomes a bigger issue~~ in Thurston County, then upgrading to an ambient groundwater sampling program should be considered. Monthly monitoring of county wells, wells used by public institutions, and Group A and Group B systems would provide more detailed and timelier groundwater data. This program could ensure that the county identifies and addresses poor groundwater quality, likely linked to OSS, in a timely manner.

OSS Inspection and Pumping Subsidies

One of the most effective ways to ensure regular O&M or at least to initiate O&M is to appeal to the owner's financial self-interest. The county already offers riser rebates and lower OSS permitting and inspection fees for low-income households. The research team recommends these programs receive continued funding and support. In addition, Thurston County could explore additional subsidies or incentives to increase compliance and increase the number of known systems in the OSS database.

Proactive OSS Education and Outreach

The county has ample OSS educational resources available on the county website. This includes brochures and videos on proper OSS management and lists of county approved OSS professionals. The county also offers "Septic Sense" workshops and self-inspection certification workshops that teach homeowners how to independently inspect their OSS. These efforts should be continued. Additionally, proactive and positive engagement with the community regarding OSS, including the importance of proper management and potential impact on public health, would be beneficial. This could lead to improved compliance, better relations between county health staff and community members, and a better understanding of the importance of routine OSS maintenance. Outreach could take the form of targeted social media campaigns, public meetings, attending and educating at public events, etc. Additionally, the county should consider sending "new homeowner packets" 6 months after a TOT is processed. This packet should include information on inspection requirements, a list of licensed professionals, and do's and don'ts of maintaining a properly functioning septic system.

Inspection Reminders

The county routinely sends inspection reminders to those within the OPC program and sends reminders to target areas where increased compliance is needed to improve water quality. The research team recommends sending notices to remind all owners of gravity and pressure distribution OSS, who are not within the county's OPC program, that routine inspection and maintenance needs of the system should be carried out. A future OSS database and dashboard that includes inspection information, system type, and OSS age could be programmed to automatically send email reminders to OSS owners when their system is due for inspection.

Updating OSS Management Plan

To meet state requirements, the OSS Management Plan should be reviewed and updated every 5 years.

2.7. OSS LMP Funding Strategies

Thurston County has several revenue streams that support OSS-related county programs. This section examines existing revenue streams and proposed funding strategies that the county should consider moving forward.

State and County Regulations

WAC 246-272A-0015 requires local health jurisdictions to:

- "Describe the capacity of the local health jurisdiction to fund the local management plan, which includes a summary of program expenditures by activity, source of funds, a strategy to fill any funding gaps, and the ability to find failing and unknown systems."

Research Team Review

Ongoing O&M activities in Thurston County are supported by a variety of funding sources as shown in Table 3. The countywide OPC program is funded through several fees collected when:

- An initial OPC is issued for a new or repaired OSS;
- Ownership of a property with an OSS is transferred; and

- Renewable OPC outside MRAs for OSS with a higher risk of impacting public health due to complexity and use are renewed.

The Henderson and Nisqually MRA programs are primarily funded by an annual fee charged through the property tax statement (~~$220~~vary between $51-$231). Beginning in 2010, a fee has been charged for each septic tank pump report filed by pumping companies ($15). This fee funds OSS complaint investigation and compliance activities for OSS reported to have deficiencies. There is also a $25 OSS Operations and Maintenance fee. A separate fee is charged for TOT reports ($290). It should be noted that all fees and the Henderson and Nisqually taxes are annually adjusted for inflation.

Grants have been used to augment work within MRAs, including dye testing. Grants have also been used to fund project work outside of MRAs, including the Black Lake PIC project described in Appendix C and D. While grant funding allows for more outreach, testing, and projects, grant funding is highly variable year to year. To ensure consistent program practices, the county needs reliable revenue sources that can sustain these efforts year to year. Table 3 includes the O&M program revenue, expenditures, and grant money received in 2023. It is important to note that revenue exceeded expenditures in 2023 due to staff turnover and staffing adjustments made to other program activities utilizing foundational public health funds.

Table 3. 2023 O&M Program Revenue, Expenditures, and Grant Money Received

2023 O&M Revenue	
Henderson MRA 2024 Assessment	$325,513
Nisqually MRA 2024 Assessment	$343,167
OPC Fees in County (non-MRA) 2023	$281,075
Pump/Inspection Report Fees 2023	$115,485
TOTAL REVENUE*	$1,065,240
2023 O&M Expenditures	
Henderson MRA	$204,497
Nisqually MRA	$196,031
County OPC	$412,501
TOTAL EXPENDITURES**	$813,029
2023 OSS O&M Grants	
OSS LMP	$55,380
NEP OSS Grant	$72,043
FPHS	NA
TOTAL GRANT VALUE	NA

*Note: The total revenue value excludes the 2023 TOT fees. If included, the total revenue would be $1,624,680.

**Note: The total expenditures value does not include TOT expenditures because this value is unknown.

A long-term funding strategy is needed in order to sustain a viable OSS program, be equitable for all OSS owners, and enhance OSS management and services throughout the county. Development of a long-term funding strategy must consider existing factors that affect current funding sources. The current economic climate is not favorable for OSS funding. Federal grants are minimal and the state is currently struggling to balance its budget, so there is little chance for additional OSS-related funding or grants at

present. Ultimately, funding sources outside of the county are highly uncertain and will likely remain that way for the foreseeable future. Therefore, the OSS management programs must be self-sustaining.

The budget and financing options should incorporate and cover the recommended actions in this updated plan so that the Environmental Health Division can continue and expand upon the O&M work they are currently leading. As a starting point, Table 4 offers a preliminary estimate of the program costs for implementing the recommendations outlined in this plan. For existing programs (those underlined and italicized in Table 4), current project expenditures were used to inform estimated project cost unless noted in the table. For many of these programs, the estimated project cost was estimated based on discussions with experts, costs for similar projects, or relevant studies. The third column of Table 4 includes the current funding source for existing programs. When the plan is adopted, ~~P~~program funding mechanisms will be evaluated ~~when the plan is adopted~~for existing, expanding, and proposed programs.

Table 4. Estimated Cost of Recommended Programs

Recommendation/Program	Program Estimated Cost	Current Funding Source
PIC Program	$900,000	Foundational Public Health Funds & Federal/State Grants ~~Groundwater Quality monitoring program (using existing data)~~
Dye Testing	$132,000	O&M program rates & charges collected on property tax in MRA only ~~Ambient Groundwater Testing Program (requiring additional sampling)~~
Quality Assurance/Quality Control Program	$40,000	O&M program rates & charges collected on property taxes in MRA only ~~Groundwater Quality monitoring program (using existing data)~~
Time of Transfer (incorporated into O&M program fees for county and tiered charge)~~*~~	$432,600	Time of Transfer Fee ~~Ambient Groundwater Testing Program (requiring additional sampling)~~
OSS inspection and pumping subsidies	$100,000	Federal/State Grants ~~Groundwater Quality monitoring program (using existing data)~~
OSS educational campaigns and outreach	$50,000	Federal/State Grants & Foundational Public Health State Funds ~~Ambient Groundwater Testing Program (requiring additional sampling)~~
Inspection reminders	$50,000	O&M program rates & charges collected on property taxes, O&M renewal fees and Federal/State grants ~~Groundwater Quality monitoring program (using existing data)~~
Urban Septic Fee to help Fund OSS to Sewer Conversion in UGAs	$345-415k $380,000 (avg)	------
OSS Dashboard and Database (Startup Cost)*~~*~~	$75,000	------

OSS Dashboard and Database (ongoing management)	$5,000	------
Groundwater Quality monitoring program (using existing data)	$60,000	------
Ambient Groundwater Testing Program (requiring additional sampling)	$100,000	------
TOTAL	$2,324,600	------

* The program estimated cost for TOT is based on the revenue generated from TOT fees in 2023~~This is a one-time cost (could be incorporated into the fee for one year or paid for via grants or other funding sources)~~

** This is a one-time cost (could be incorporated into the fee for one year or paid for via grants or other funding sources)

~~The program estimated cost for TOT is based on the revenue generated from TOT fees in 2023~~

Recommended Actions

The county has developed several different LMP funding recommendations. Based on WAC requirements that require county OSS management plans to consider an increased number of areas where OSS pose an increased public health risk, the research team strongly recommends ~~expanding the~~developing an O&M program that~~e~~ covers the entire county. The county is heavily reliant on groundwater, with numerous special protection areas, and water bodies with contaminants of concern (phosphorous, nitrogen, and bacteria). Therefore, expanding ~~the~~ O&M ~~program~~ services to improve compliance across the county is essential to maintain and improve both ground and surface water quality.

Single Flat Fee for All OSS Parcels (Tax Roll)

This will provide stable funding to the Environmental Health Division for an O&M program countywide and management of special areas, both current and future. The recommended fee would replace the current O&M fees, pump report fees, TOT application fees, and MRA charges. The work group recommends an additional charge for multiple OSS per parcel (no cap; amount to be determined) and a 50 percent rate reduction for those in the senior/disabled tax exemption program or meeting the poverty line income threshold.

Tiered Charge Alternative (Tax Roll)

Tiered alternative that helps assure charges are commensurate with the services provided. This structure charges the highest amount for septic systems in Watershed Protection Areas, MRAs, or other special areas designated by the Board of Health, an intermediate amount for septic systems in Puget Sound watersheds outside of special areas, and a lower amount for septic systems in the Chehalis Watershed, also outside any special areas (see Figure 5 for delineation of these three tiers). It anticipates additional costs for septic systems in Watershed Protection Areas and MRAs due to periodic dye tracing of high-risk systems, and that septic system related water quality investigations will take place in both the Watershed Protection Areas/MRAs and Puget Sound Drainage areas. As with the original flat fee proposal, the charges would replace the current O&M fees, pump report fees, TOT application fees, and the shellfish protection district charges within the designated MRAs. There would

be an additional charge for multiple OSS per parcel (no cap; amount to be determined) and a 50 percent rate reduction for those in the senior/disabled tax exemption program or meeting the poverty line income threshold.

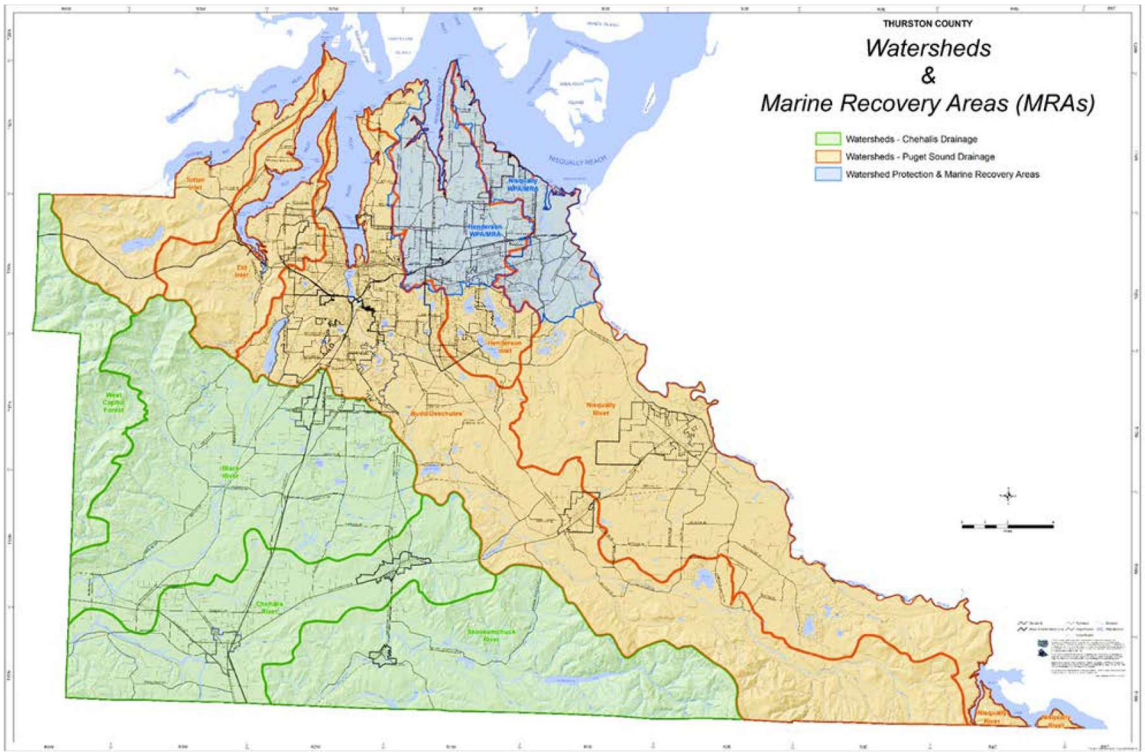

Figure 5. Map Showing Areas for Tiered O&M Charge Option

Add O&M Fee to Online RME Report Submittal

Add O&M fee for online RME submittal for all inspection and pump reports to provide stable funding to the Environmental Health Division for an O&M program and PIC activities countywide, both current and future. The recommended fee would replace the current O&M fees, and pump report fees. The recommended fee would not cover TOT application fees. The shellfish protection district charges within the designated MRAs would remain and would not require paying an O&M fee to online RME for any reports. The county currently has a $15 pump report submittal fee through online RME.

Standardize MRA and SA Fees (Existing Fee Structure)

This structure keeps the existing charges; the current O&M fees, pump report fees, and TOT application fees, and would add charges for newly designated MRAs and sensitive areas. It anticipates additional costs for septic systems in Watershed Protection Areas and MRAs due to periodic dye tracing of high risk systems, and ensures that septic system related water quality investigations will take place.

Apply for Centennial Clean Water Grants or Alternative Grants

This structure keeps the existing charges; the current O&M fees, pump report fees, TOT application fees, and MRA charges. Thurston County will apply for centennial clean water or other relevant grants as applicable to promote O&M requirements in southern Thurston County.

3. Implementation Strategy

The implementation of this updated 2025 OSS Management Plan is recommended as follows:

Phase 1: Adopt the 2025 OSS Management Plan Update.

Phase 2: Work with the Board of Health to prioritize the plan's recommendations and adopt a funding mechanism for implementation~~to adopt sustainable funding mechanism that supports county-wide implementation of this plan to implement priority recommendations~~.

Phase 3: Prioritize designation of MRAs and special areas due to their importance to public health and impact on critical industries, such as shellfish and recreation~~. Redesign of septic O&M program to expand county-wide to all septic systems.~~

Phase 4: Continue building on existing efforts, leveraging current initiatives and partnerships to make steady, incremental progress toward full implementation of the plan's recommendation.

The implementation phases should occur across the next five years.

4. References

Hansen, Kevin. 2022. Draft-Final Water Resources Technical Memo 62: Nitrate Loading from OSS/Septic Systems to Groundwater. April.

King County. 2024. Septic System Code Revision Newsletter – Changes to Statewide OSS Codes. March. Available here.

Kitsap Public Health District. 2025. Onsite Sewage By the Numbers. Available here.

LOTT, Port of Olympia, City of Olympia, AECOM. 2019. Olympia Sea Level Rise Response Plan. March. Available here.

Mauger, Won, and UW Climate Impacts Group. 2019. New Projections of Changing Heavy Precipitation for Thurston County. July. Available here.

Puget Sound Partnership. 2022. 2022-2026 Action Agenda for the Puget Sound. August 12. Available here.

Puget Sound Partnership. 2022. Nitrate Concentration in Source Water. Available here.

Regional Septic Work Group, Law Office of Kathleen Callison, and FCS GROUP. 2015. Urban Septic Assessment Report. March.

Thurston County Department of Public Health and Social Services. 2025. Pollution Identification Correction. Available here.

Thurston County Environmental Health Division. 2025. Article 1 Appendix A – Environmental Health Fee Schedule. Available here.

Thurston County Environmental Health Division. 2025. Article IV: Rules and Regulations of the Thurston County Board of Health Governing Treatment and Dispersal of Sewage. April. Available here.

Thurston County Environmental Health Division. Aquifer Recharge Areas. Available here.

Thurston County Environmental Health Division. Pollution Identification Correction. Available here.

Thurston County Public Health and Social Services Department, Environmental Health Division; Thurston County Community Planning and Economic Development, Stormwater Program. 2020. Thurston County Water Resources Monitoring Report 2018-2019 Water Year.

Thurston County Washington, 2024, Homeowner Maintenance & Requirements. Available here

Thurston County, 2024, Care & Maintenance of Your Septic System. Available here

Thurston County, 2024, FREE Septic Sense Workshop. Available here

Thurston County. 2024. Black Lake Pollution Identification and Correction Project. Available here.

Thurston County. Adopted 2020. Thurston County Comprehensive Plan. December. Available here.

Thurston Regional Planning Council. 2018. Thurston Climate Adaptation Plan: Climate Resilience Actions for Thurston County and South Puget Sound. Available here.

Thurston Regional Planning Council. 2023. Hazard Mitigation Plan. November. Available here.

US EPA. 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria Rivers and Streams in Nutrient Ecoregion II. December. Available here.

US EPA. 5.7 Nitrates. Available here.

WAC 173-200-040

WAC 173-201A-230

Washington State Department of Health, Office of Environmental Health and Safety. 2025. Commercial Shellfish Map Viewer. Available here.

Washington State Department of Health. 2016. Puget Sound Septic System Management Programs: Best Management Practices Reference Manual. March. Available here.

Washington State Department of Health. 2024. Eld Inlet Annual Shellfish Growing Area Review. December. Available here.

Washington State Department of Health. 2025. Shellfish Growing Areas. Available here.

Washington State Department of Health. 2024. Summary of Key Rule Changes: On-Site Sewage Systems Chapter 246-272A WAC. February. Available here.

APPENDIX A

Outreach Participants

Category	Business/Affiliation	Name
Industry	A-Advanced Septics	Kyle Salsi, Richard
Industry	Dodge Excavation LLC	
Industry	Advanced Engineering	Chris Elstrott
Industry	House Brothers Construction	
Industry	Howdy's Doody Service Inc	
Industry	WOSSA	Leigh McIntire
Industry	Economy Septic and construction Inc	Denise Carter
Tribal/shellfish	Shellfish Protection District Nisqually Tribe	Margaret Homerding
Shellfish	Taylor Shellfish	Erin Ewald
Tribal/shellfish	Squaxin Island Tribe	Erica Marbet
Regulatory	DOH	Kerrie Yonda
Realty	John L. Scott Real Estate	Guy Duvall
Thurston	Water Quality and PIC team Supervisor	Tristen Payne
Thurston	OSS Permitting	Dawn Pebbles
Thurston	Natural resource manager, community planner	Bryan Benjamin, Derek Day
Thurston	Hydrogeologist (OSS and groundwater)	Kevin Hansen

APPENDIX B

State Regulations and Guidance Documents Summary

Washington State Regulations Pertaining to OSS Management Plans and Maintenance

WAC 70A.110.030 requires counties bordering the Puget Sound to develop and OSS Management Plan to provide guidance to the local health jurisdiction.

WAC 246-272A-0015 requires local health officers in each Puget Sound county to develop an OSS management plan. The plans will be reviewed by April 1, 2027; if a revision is necessary, the local health officer must include the following elements, specifying how the local health jurisdiction will:

- Develop and maintain an inventory, including the type and location, of all known OSS in operation;
- Identify areas where OSS could pose an increased public health risk, including:
  - Shellfish protection districts or growing areas;
  - Sole source aquifers;
  - Areas where aquifers are used for potable water;
  - Wellhead protection areas in Group A public water supplies;
  - Up-gradient areas influenced by water recreation facilities designed for swimming in natural waters;
  - Special protection areas;
  - Wetland areas under production of crops;
  - Frequently flooded areas;
  - Areas where nitrogen is a contaminant of concern;
  - Areas where phosphorous is a contaminant of concern;
  - Areas where sea level rise may impact horizontal separations to surface water; and
  - Other areas designated by the local health officer.
- Identify operation, maintenance, and monitoring requirements commensurate with risks posed by OSS;
- Educate OSS owners on how to maintain their OSS, including information on how to complete an inspection;
- Maintain required records, including operation and maintenance activities;
- Enforce OSS owner permit application, operation, monitoring and maintenance and failure repair requirements of state law;
- Describe the capacity of the local health jurisdiction to fund the management plan, including a summary of program expenditures by activity, source of funds, a strategy to fill any funding gaps, and the ability to find failing and unknown systems; and
- Verify that the management plan was developed in coordination with the comprehensive land use plan.

The department shall review the management plan for Puget Sound counties at least once every five years. The local health officer for Puget Sound counties shall:

- Review and update the management plan at least once every five years;
- Provide an opportunity for public input on the management plan after it is updated;

- Submit the management plan to the department for review;
- Implement the management plan;
- Submit an annual report to the department including the following:
  - Number of OSS;
  - Number of unknown OSS identified;
  - Number of failures found;
  - Number of failures repaired; and
  - Status of compliance with inspections required by state law.
- Supply a copy of the management plan to entities responsible for land use and planning and development regulations.

In order to implement the plan according to this chapter, the local health officer shall require the owner of the OSS to:

- Comply with requirements identified in the plan for the location, design, or performance; and
- Comply with the conditions of the operational permit, if one is required.

In order to implement the plan according to this chapter, the local health officer may require the OSS owner to:

- Ensure additional maintenance and monitoring of the OSS;
- Provide easements for inspections, maintenance, and potential future expansion of the OSS; and
- Place a notice to the title identifying additional requirements for OSS operation, maintenance, and monitoring.

The department shall maintain and update guidance and provide technical assistance to assist local health jurisdictions in management plan development.

WAC 246-272A-0270 states that the OSS owner is responsible for operating, monitoring, and maintaining the OSS to minimize the risk of failure, and shall:

- Request assistance from the local health officer upon system failure or suspected failure;
- Obtain approval from the local health officer before:
  - Repairing, altering, or expanding an OSS as required by state law; or
  - Before beginning the use of a newly constructed OSS;
- Secure and renew contracts for maintenance if required;
- Obtain and renew operation permits in required;
- Obtain an inspection, as required by state law, by a maintenance service provider authorized by the local health officer of all OSS and property to determine functionality, maintenance needs and compliance with this chapter and local rules, and any permits:
  - At least once every three years for all OSS consisting solely of sewage tank and gravity SSAS;
  - Annually for all other OSS;
  - Submit the results of the inspection to the local health jurisdiction;
- Employ an approved pumper to remove septage from the tank when the level of solids and scum indicate removal necessary;

- Provide ongoing maintenance and complete needed repairs;
- Protect the OSS area and the reserve area from:
  - Cover by structures or impervious material;
  - Surface drainage, and direct drains, such as footing or roof drains;
  - Soil compaction; and
  - Damage by soil removal and grade altercation.
- Keep the flow of sewage to the OSS at or below operating capacity;
- Operate and maintain OSS as directed by the local health officer;
- At the time of property transfer:
  - Provide the buyer all available OSS maintenance and repair records in addition to the completed seller disclosure statement;
  - Beginning February 1, 2027, obtain an inspection by a third-party inspector, and obtain an inspection of treatment products per manufacturer recommendations, as required by state law. The local health officer may:
    - Remove the requirement for an inspection at the time of property transfer if there is evidence that the OSS has had an inspection in either the last three years for sewage tank or gravity SSAS, or one year for all other OSS types;
    - Verify the results of the property inspection for compliance with state law; and
    - Require additional inspections and other requirements not listed in state law;
  - Submit the results of the inspection, and any other required information/reports, to the local health jurisdiction.

DOH Guidance Documents

In 2006 and 2007, DOH produced guidance for Puget Sound local health jurisdictions in their creation or improvement of their OSS Management Plans. More recently, in 2016, DOH with support from other entities wrote the Puget Sound Septic System Management Programs: Best Management Practices Reference Manual[25] to help educate and support the work of stakeholders, including professional staff and others who help create, update and carry out local OSS management programs. This manual serves as a primer on the many issues, elements, and activities that form the septic system management programs carried out by the 12 local health jurisdictions around Puget Sound. The manual lays out the regulatory framework of OSS management, highlights challenges and barriers to OSS management programs, and compares the local management programs around Puget Sound.

In addition, the manual includes a list of fundamental and key ingredients needed to create an effective management program. These go beyond the six elements (database enhancement, sensitive areas, O&M sensitive areas, MRAs, education, and implementation) initially listed for inclusion in OSS management plans in the 2006 guidance. The 2016 manual lists the following as key OSS Management program elements:

[25] Washington State Department of Health. 2016. Puget Sound Septic System Management Programs: Best Management Practices Reference Manual. March. Available here.

- **Data and Data Management** - Virtually all elements are linked with and benefit from a solid foundation of data management. Inventory data on location, type, and current status of all septic systems is needed in order to effectively manage a program.
  - Maps are an excellent tool to both acquire data and to present it. Geographic information systems (GIS) and other mapping tools are extremely useful for analyzing data, portraying findings, and determining where to focus program resources.
- **Permitting and Repairs** - Local health's historical responsibility permitting and inspecting new or repaired systems is well founded and well accepted today.
  - New septic system permits, repair permits (major and minor)
- **Complaint Response** - Investigating and responding to complaints is a standard component of all programs. Local health jurisdictions are required to follow up on all complaints to determine whether a problem exists and, if so, to initiate some form of corrective action.
- **Operations and Maintenance** - O&M functions and activities are so important that people sometime use the terms "O&M program" and "management program" interchangeably. Proper use and care of systems is a smart and efficient way to improve treatment, avoid costly repairs, and extend the life of an on-site sewage system.
- **Inspection Frequency and Compliance** - State law requires inspection frequencies of at least every three years for gravity systems and at least annually for all other types of systems.
- **Ghost Sewage Discharges** - Local programs aim to address and correct practices that were accepted decades ago. The service provider is responsible for a full inspection of the septic system. However, the inspector can risk losing a client if they uncover a hidden problem during full evaluation of a system and the property.
  - Local health jurisdictions play a role helping to identify these types of discharges. Using Pollution Identification and Correction (PIC) methods (described below) in concert with standard O&M requirements is key to identifying poor water quality and methodically working upstream to find and correct such illicit discharges.
- **Homeowner Inspections** - Ten local health jurisdictions make some provision for homeowners to do their own system inspections, including Thurston County.
- **Other types of Inspections** - Reports of septic tank pump outs are often included in data records. Thurston County attaches pump records to the database to provide a maintenance history of the system.
- **O&M Incentives and Rebates** - One of the most effective ways to ensure regular O&M or at least to initiate O&M is to appeal to the owner's financial self-interest. Septic system incentives and rebates can take many forms and can be used for a variety of services such as system inspections, tank servicing, and riser retrofits (riser rebates offered in Thurston County).
- **Geographic Area to focus O&M** - Local health jurisdictions prioritize where to focus O&M inspection compliance based on proximity to shellfish growing areas, marine and freshwater shorelines, type and age of systems, and other related factors (MRA and OPC Program in Thurston County).
- **Water Quality Monitoring** - In these situations, water quality monitoring plays a key role helping local health jurisdictions and other agencies assess background conditions and detect and correct problems in a timely manner.

- **Pollution Identification and Correction (PIC)** - These local programs serve as the ideal complement to local septic system management programs. In fact, O&M and PIC are so closely related that PIC can serve as the water quality monitoring element of a comprehensive management program.
  - PIC programs are beneficial in that the approach and tactics help identify fecal pollution from all sources, not just malfunctioning septic systems. Livestock on commercial operations, farm animals on hobby farms, or even raccoon latrines in areas where residents are feeding the raccoons may be identified.

DOH will also be releasing updated guidance in the fall of 2025.

Puget Sound Action Agenda

PSP released their 2022-2026 Action Agenda for Puget Sound in August of 2022.[26] The purpose of the agenda is to provide guidance on the most effective and beneficial outcomes, strategies, and actions for Puget Sound recovery and resilience. The Action Agenda includes a list of desired outcomes meant to demonstrate how vital signs lead to strategies and actions on the ground. The second desired outcome is to protect and improve water quality, which includes a more detailed target that "OSS are inventoried, inspected, maintained and operational."[27] The agenda also mentions the importance of allocating funding and incentives to transition small communities from OSS to small-scale water treatment and reuse programs.[28] The action agenda mentions OSS again when talking about how to integrate climate change responses to help reduce pollutants from wastewater systems. Incorporating climate change education within technical and financial assistance for OSS owners is an action that could support this target.[29]

[26] Puget Sound Partnership. 2022. 2022-2026 Action Agenda for the Puget Sound. August 12. Available here.
[27] Ibid. Page 19.
[28] Ibid. Page 57.
[29] Ibid. Page 70.

APPENDIX C

Water Quality Data Analysis

Water Quality Data Review

The Environmental Health Division collects water quality data for several bodies of water and waterways throughout Thurston County. The division has collected water quality data on local streams since 1983 and publishes the data in annual Water Resources Monitoring Reports. These reports include water quality data for dozens of stream sites across the eight watersheds in Thurston County (Totten, Eld, Black, Chehalis, Skookumchuck, Budd/Deschutes, Henderson, and Nisqually). The exact site locations and number of sites monitored vary year to year, but all the sites are sampled monthly. In addition to water quality monitoring, the county conducts Pollution Identification and Correction (PIC) projects in areas with water pollution problems. Additional water quality samples are collected during these projects, which are used to identify and then correct sources of pollution.

Water quality monitoring and PIC projects in Thurston County utilize a variety of indicators to measure water quality throughout the region's lakes, streams and rivers. The Water Quality Index (WQI) is a set of seven key indicator variables and associated standards that, when results from all categories are combined, produce a score of overall water quality between 1 and 100 (with lower scores reflecting lower water quality).[30] Within those seven indicators of the WQI, three are of particular significance when discussing and identifying water pollution related to OSS operations: Total Nitrogen (TN), Total Phosphorous (TP), and fecal coliform (the WQI measuring concentrations of E. coli specifically).

Phosphorous and Nitrogen

The updated Chapter 246-272A WAC increased the number of areas that must be considered in OSS management plans, including areas where phosphorous and nitrogen pose a potential public health concern. When nitrogen and phosphorus levels rise above naturally occurring levels, it can be due to poorly functioning OSS that are releasing untreated effluent into the water body. This in turn can lead to algae blooms and have negative impacts on wildlife, including shellfish, and public health.

In Washington State, TN and TP are key indicators of water quality in streams, lakes, and groundwater, though the state has not established numeric water quality standards for these nutrients for above-ground waterways. Both nutrients can limit biological productivity, with phosphorus often being the most limiting due to its low natural abundance.

In lakes, excess phosphorus is closely associated with harmful algal blooms. Studies show algae growth becomes problematic when surface phosphorus levels exceed 0.03 mg/L,[31] with a state action value set at 0.02 mg/L in the lower mesotrophic level of a lake.[32] In streams, phosphorus and nitrogen are considerations within the Water Quality Index (WQI) score as ecosystem function indicators, though neither has formal numeric criteria. The U.S. Environmental Protection Agency (EPA) recommends phosphorus concentrations in rivers and streams stay below 0.01 mg/L to protect aquatic life.[33]

[30] Thurston County Department of Public Health and Social Services. 2025. Pollution Identification Correction. Available here.
[31] Thurston CountyEnvironmental Health Division. Pollution Identification Correction. Available here.
[32] WAC 173-201A-230, 2021.
[33] US EPA. 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria Rivers and Streams in Nutrient Ecoregion II. December. Available here.

Nitrogen, while also a limiting nutrient, is more readily introduced into water bodies through human activities. For drinking water, the federal and Washington state standard for nitrate (a form of nitrogen) is 10 mg/L.[34] In groundwater, Washington applies an action threshold of 10 mg/L nitrate and an early warning threshold of 5 mg/L. Thurston County uses a more protective threshold of 4 mg/L. According to the Puget Sound Partnership, "Most groundwater in Puget Sound is not contaminated by nitrates. Across Puget Sound, the average concentration of nitrate in source groundwater (pre-treatment) remained at low levels from 2011 to 2021. Concentrations of nitrates above 2 mg/L in groundwater supplies indicate human activities are the source of the contaminant."[35]

The EPA notes that nitrogen concentrations in surface waters above 0.3 mg/L indicate potential human influence for this ecoregion.[36] Other EPA sources state that TN levels greater than 1mg/L is a good indicator that surface water is being impacted by agricultural runoff, stormwater, wastewater treatment plan effluent, or failing OSS.[37]

Though the state does not have established action levels of TP for all types of waterways, the research team used the lake surface water TP value of 0.03mg/L as an indicator. Water bodies with TP levels above 0.03 mg/L are at risk of eutrophication and malfunctioning OSS could be contributors to this pollution. The state also does not have established action levels for TN for all types of waterways, so for this analysis the research team used the general EPA indicator of 1 mg/L to highlight waterways with concerning levels of TN.

Scatter Creek: Scatter Creek is in the southwestern portion of Thurston County and is part of the Chehalis Watershed. It supports unique prairie habitat and several imperiled species. Residents also rely on the Scatter Creek Aquifer for drinking water. The average annual level of TP has decreased over the past twenty years, falling below the reference condition set by the EPA (0.03 mg/L) in 2018.

The level of nitrogen present in the water has fluctuated greatly over the past twenty years. Due to the Scatter Creek Aquifer's importance as a sole source aquifer, the county led an effort to decrease TN levels found in this region. This project started in 2012 and ended in 2014. The project included community outreach and modeling for impacts under different future land use scenarios. OSS were identified as a significant threat to Scatter Creek Water Quality. There was a significant decline in TN between 2007 and 2018. Since 2016, the TN levels have remained below the EPA reference condition (1 mg/L) and far below the drinking water standard (10 mg/L) (see Figure C-1).

[34] WAC 173-200-040
[35] Puget Sound Partnership. 2022. Nitrate Concentration in Source Water. Available here.
[36] US EPA. 2000. Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria Rivers and Streams in Nutrient Ecoregion II. December. Available here.
[37] US EPA. 5.7 Nitrates. Available here.

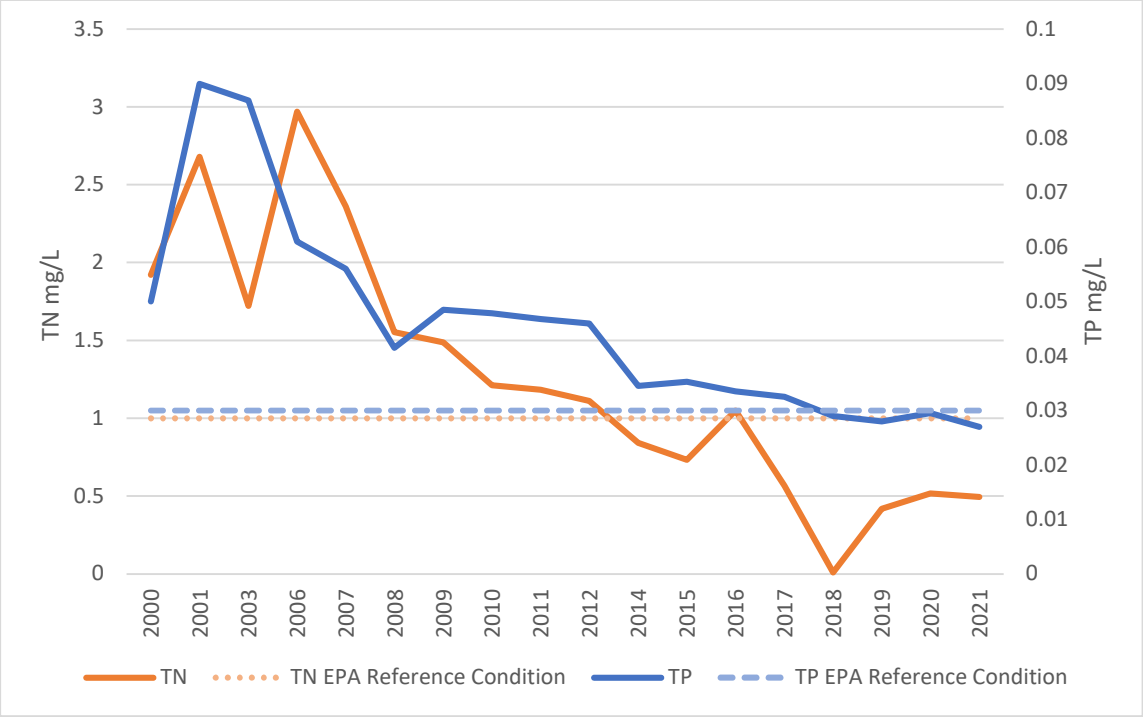

Figure C-1. Total Nitrogen and Phosphorous in Scatter Creek

Deschutes River: The Deschutes River is part of the Budd/Deschutes Watershed. The river is 50 miles long, starting in Lewis County. It runs through the middle of Thurston County before emptying into Budd Inlet. The Deschutes River tells a similar story to Scatter Creek. The TP levels fluctuated over the past twenty years, averaging 0.034 mg/L (see Figure C-2). Though the water samples fell below the EPA reference level in 2018 and 2019, they rose back above the reference level in 2021. Unlike the TP results, the TN level has consistently remained below 1 mg/L over the past two decades. In 2021, the most recent data point, the TN levels are less than half the EPA reference level. The fluctuating levels of TP could indicate an inconsistent run-off or failing OSS issue, which impacts both ecosystem and community health. The excess nutrients also flow into Budd Inlet where they can impact shellfish and recreational activities.

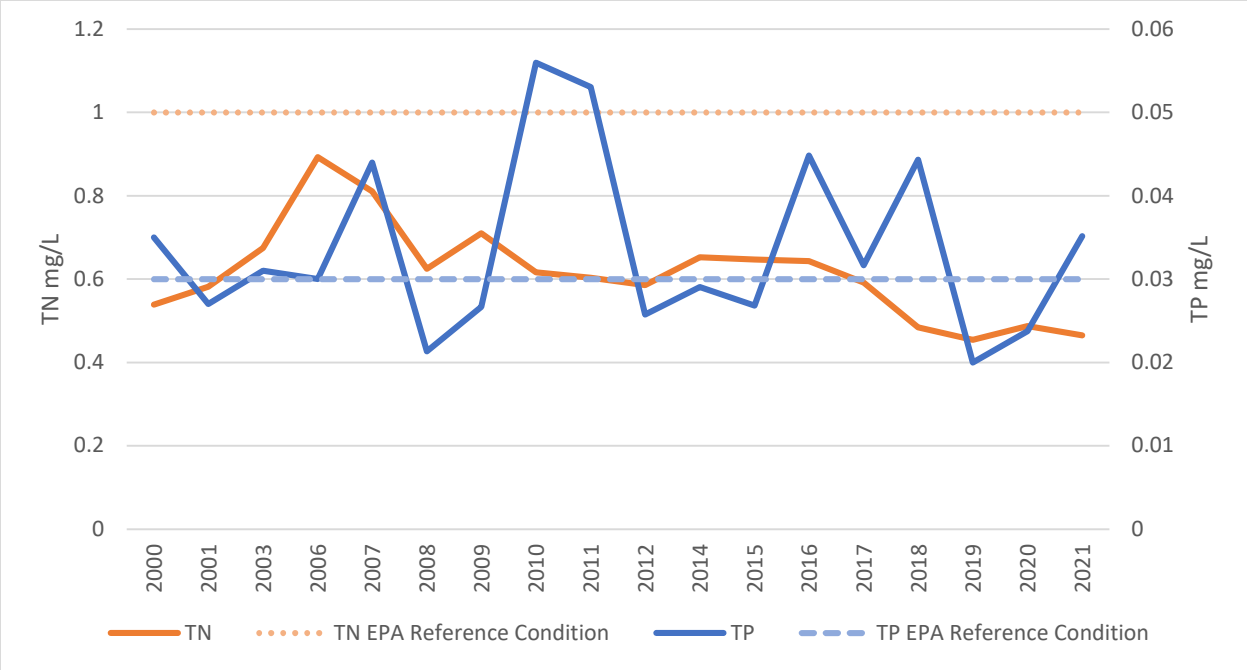

Figure C-2. Total Nitrogen and Phosphorous in Deschutes River

Totten Inlet: Totten Inlet sits in the northwestern corner of Thurston County and is part of the Totten Watershed. The Inlet is nine miles long and is known for its oyster production. The TP levels in Totten Inlet consistently remained below 0.05 mg/L from 2004 to 2021, averaging 0.026 mg/L (see Figure C-3). Though the TP level rose above the EPA reference condition in 2004 and 2010, it has since remained below the 0.03 mg/L reference point. TN levels have remained fairly consistent over the past two decades, far below the EPA reference condition. Though important due to its shellfish production, nutrient levels are less problematic in this Inlet compared to some of the other sites evaluated.

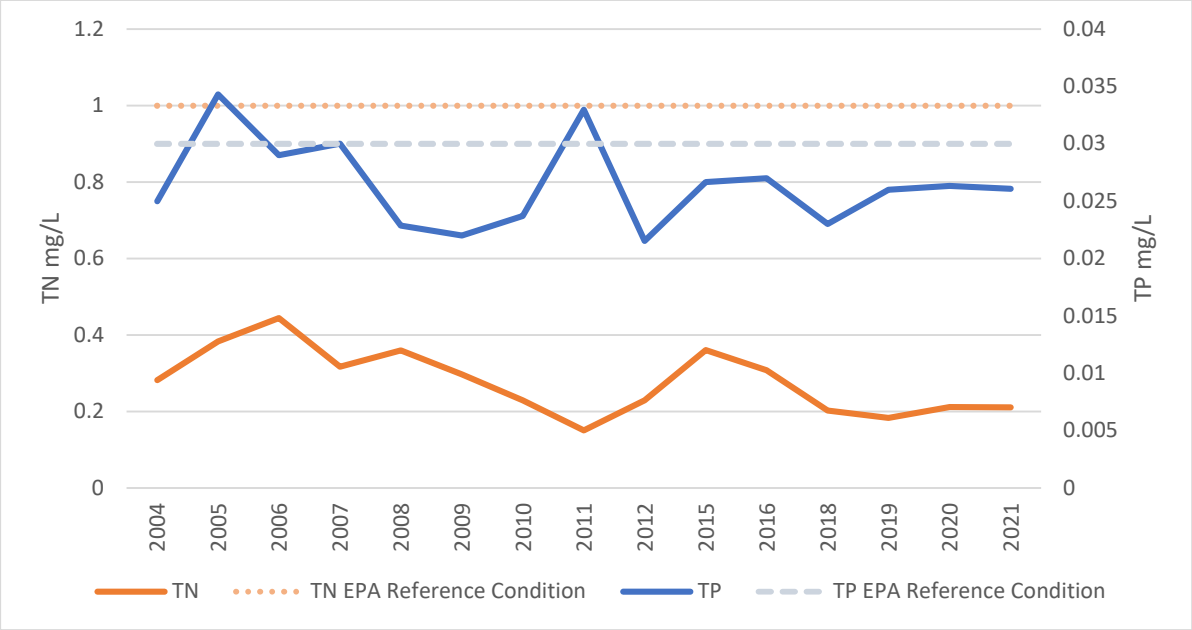

Figure C-3. Total Nitrogen and Phosphorous in Totten Inlet

Eld Inlet: Eld Inlet is also located in the northwestern section of Thurston County – just east of Totten Inlet. Eld Inlet is part of the Eld Watershed and is also known to have productive shellfish populations. Eld Inlet is popular for recreational shellfish harvesting but due to high levels of diarrhetic shellfish poisoning (DSP), the county has been forced to limit or prevent shellfish harvesting in this area for extended periods of time over the last few years. Shellfish accumulate DSP by consuming algae that produces the DSP toxin. The toxin then bioaccumulates in the shellfish, causing public safety concerns if consumed by humans. These algae are naturally occurring, but large blooms can occur under certain conditions – one of which is high nutrient levels. It should be noted that this is a relatively new issue, with instances of DSP occurring over the past few years.

Over the past two decades, the majority of the TP results have fallen above the EPA reference condition (see Figure C-4). The most recent three results have all fallen above the reference condition, which is a threshold for algal blooms. From 2004 and 2021 the TN levels in Eld Inlet hovered between 0.3 mg/L and 0.6 mg/L, which is far lower than the EPA reference condition. The higher level of phosphorus along with warmer water temperatures and other factors could be contributing to the DSP levels. The nutrient concentrations pose a significant concern to shellfish harvesting. Note that data was not available for 2013 and 2014.

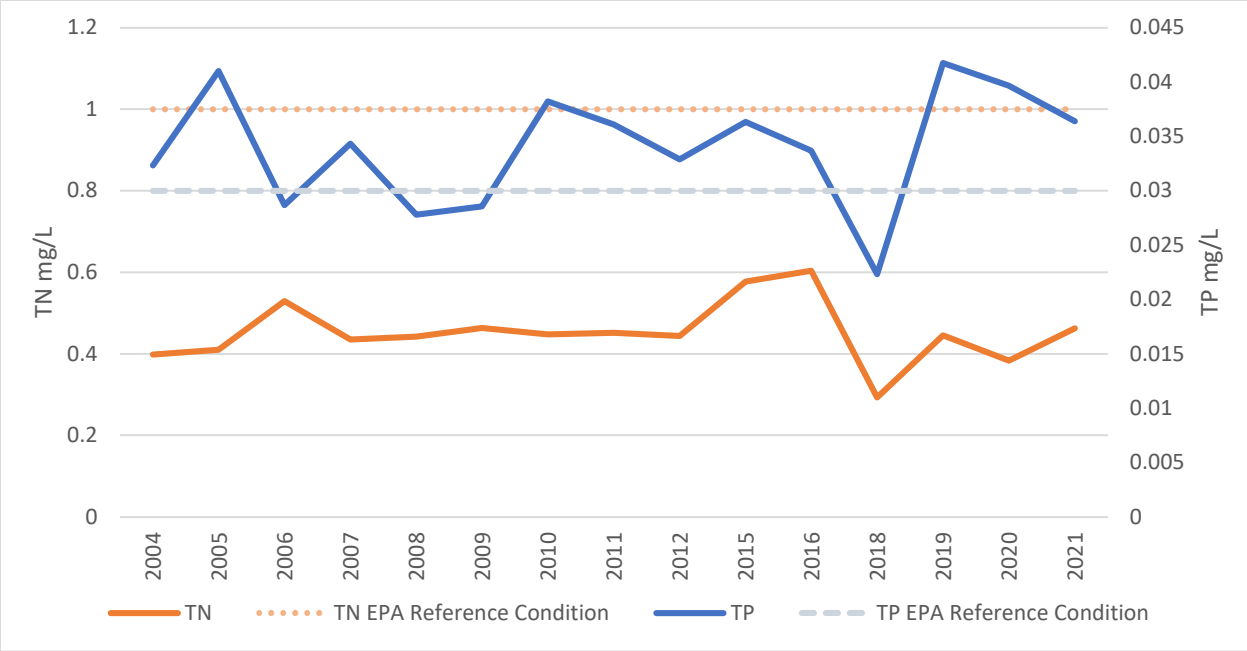

Figure C-4. Total Nitrogen and Phosphorous in Eld Inlet

Summit Lake: Summit Lake is part of the Totten Inlet Watershed in the northwestern portion of Thurston County. It feeds into Kennedy Creek, which eventually discharges into Totten Inlet. The Lake covers 530 acres. The average depth is 53 feet, and the maximum depth is 100 feet. The lake is used for recreational purposes and is used to supply domestic water. Most of the lake residents rely on the lake for drinking water, so maintaining its good water quality reputation is especially important. The surface water of Summit Lake has stayed well below the EPA reference level for both TN and TP since 2009 (see Figure C-5).

The concentration of both nutrients is greater at the bottom of Summit Lake because it is thermally stratified during the summer. The higher nutrient levels at the bottom of the lake are not concerning. However, the recent trend of increasing levels of TN and TP should be noted, especially since this lake serves as both a recreational site and a potable water source for Thurston County residents. It also has experienced noteworthy harmful algal blooms in the recent past (2017 and 2019) during which those who relied on the lake for potable water had to be supplied by the county for significant periods of time.

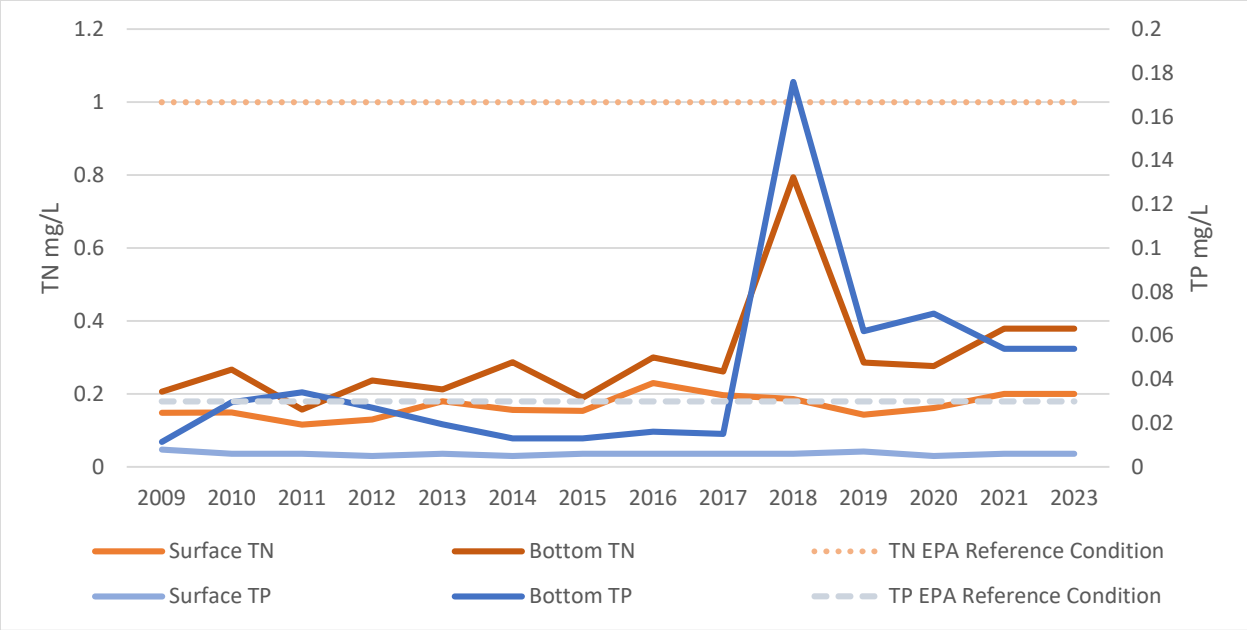

Figure C-5. Summit Lake TN and TP

Black Lake: In 2024 Thurston County led a pollution identification and correction project at Black Lake to identify and correct sources of bacteria and nutrient pollution. As one of the largest lakes in the county, it serves as a popular recreational spot. The county collected multiple water samples around the lake and analyzed them for E. coli and phosphorus concentrations. The county would trace sources of contamination from the polluted samples they collected. They discovered that poorly functioning OSS, animal waste and inorganic fertilizers were the main contributors to pollution in the lake. They conducted voluntary sanitary surveys to help homeowners identify pollution sources and provided them with resources to reduce or eliminate these sources. The impact of this project will be further explored as this data becomes available.

Henderson Inlet and Nisqually Reach: Both Henderson Inlet (HI) and Nisqually Reach (NR) are designated Marine Recovery Areas in the northeastern part of the county. As such, homeowners within their boundaries require an OPC. These regions received MRA status because they had high concentrations of bacteria and nutrients leading to poor ecosystem health and increased risk to public health. They are also important shellfish production areas. A significant contributor to the high concentration of nutrients was poorly functioning OSS along the shoreline and within these watersheds, which is what led to the OPC program beginning in 2008. As seen in Figure C-6, the TP levels in both areas are still greater than the EPA criteria (0.03 mg/L). The average TP level for the NR between 2008 and 2019 was 0.056 mg/L and the average for HI was 0.071 mg/L. The recent increase in TP from 2018 to 2019 is concerning, highlighting the importance of maintaining strict OSS regulations within these regions.

Figure C-7 shows that the TN levels in both HI and NR have historically been higher than the EPA criteria (1 mg/L). However, TN concentrations have steadily decreased over this time period for both MRAs, with most of the recent Henderson Inlet TN results falling below the EPA threshold. Even though there has been marked improvement in TN concentration levels, TN is still a concern in both HI and NR.

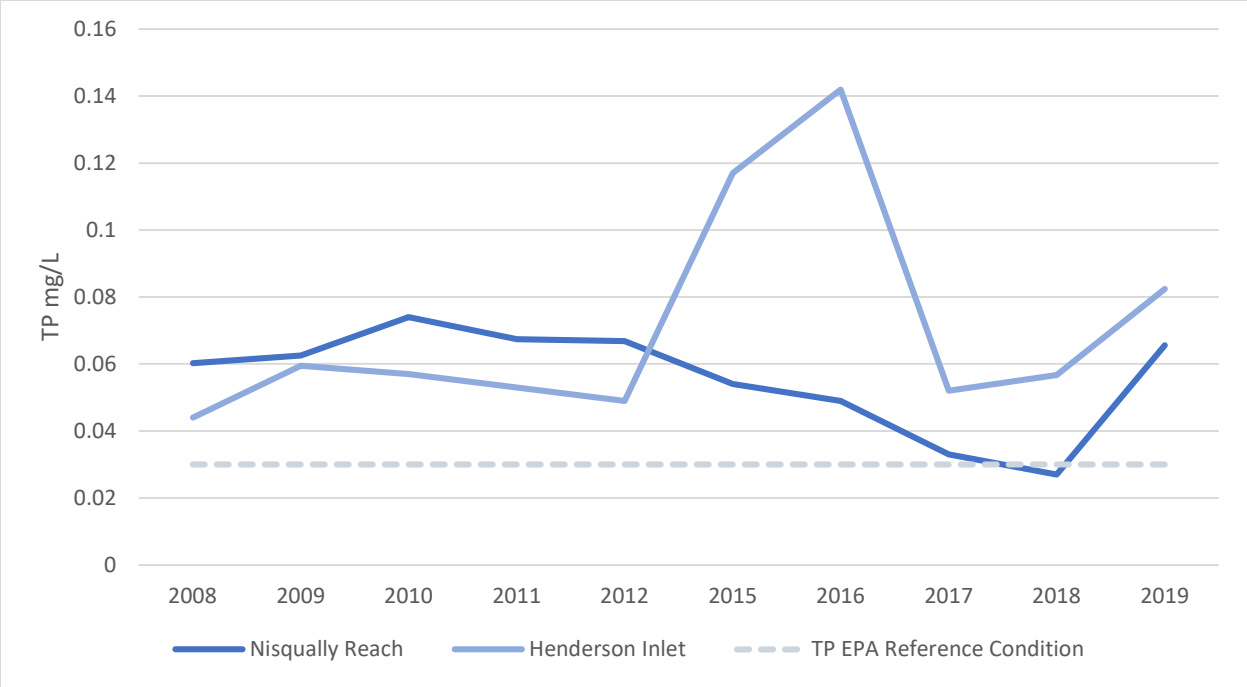

Figure C-6. Total Phosphorous in Henderson Inlet and Nisqually Reach

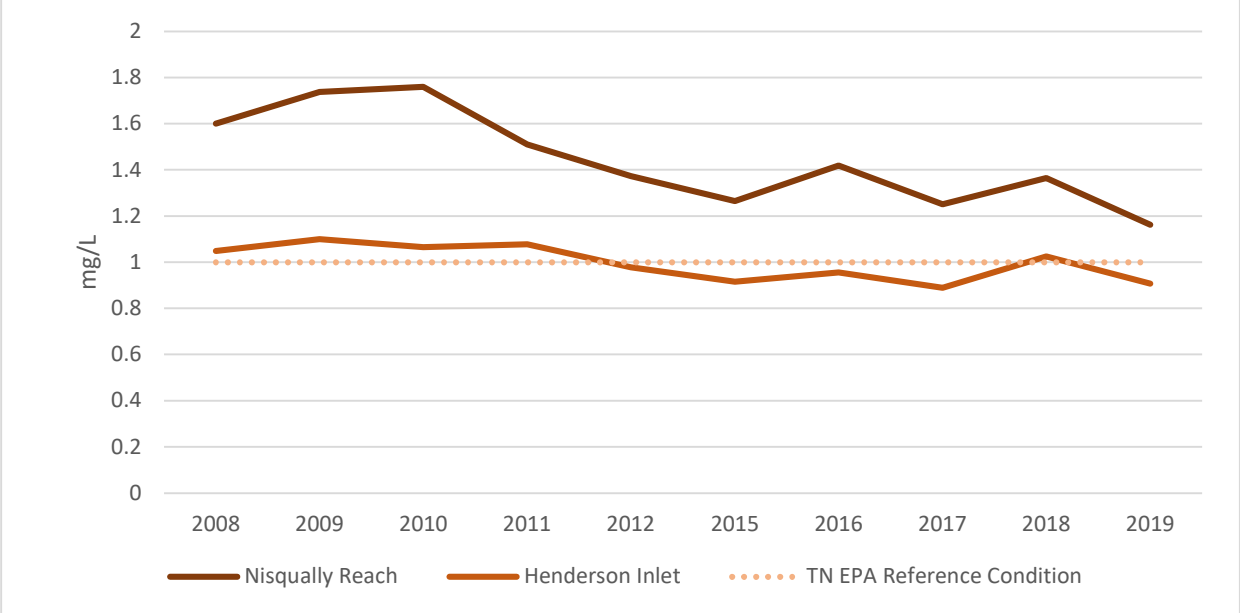

Figure C-7. Total Nitrogen in Henderson Inlet and Nisqually Reach

Fecal Coliform

Concentrations of fecal bacteria (or fecal coliform) are an especially helpful indicator of pollution from OSS operations. Fecal bacteria indicators can be more directly tied to septic leakage, as opposed to TN and TP which can be contributed from a wide variety of sources (most commonly agricultural runoff) and may not be reliable signals of septic system pollution on their own. Water quality data on fecal

coliform (FC) in Thurston County was not available for lakes, therefore data and discussion on this particular variable will center only around testing sites for rivers, streams and marine waters.

Annual streams reports provided by Thurston County and water sampling station data from the DOH Commercial Shellfish Map Viewer[38] detail historical sample station data of FC concentrations from water quality monitoring sites throughout the county. These waters are subject to one of three categories of water quality standards for recreational water contact (RWC) depending on station site location. The three categories are Freshwater Primary Water Contact ("where people have direct contact with water, with exposure to the eyes, ears, nose, and throat"), Freshwater Extraordinary Primary Water Contact ("intended to provide extraordinary protection against waterborne disease to people having direct contact with the water and to protect water that feeds and surrounds shellfish harvesting areas"), and Marine Primary Contact.[39]

Bacterial concentrations are measured in CFU (or "colony forming units") per 100mL of water, with standards for each RWC type broken into two main criteria: (1) a maximum allowable geometric mean concentration and (2) upper-limit concentration value that no more than 10 percent of sample data values can exceed (See Table C-1 established under the WQI, which tests for E. coli bacteria specifically as the indicator variable for fecal coliform. WQI criteria for E. coli concentrations, like those of fecal coliform for RWC standards, are two-fold: (1) the geometric mean of sample data must not exceed 100 CFU/100 mL and (2) no more than 10 percent of the samples can consist of values that exceed 320 CFU/100mL (See Table C-1).

Table C-1. Fecal Bacteria Concentration Criteria by Standard*

Standard	Indicator Variable	Geometric Mean (CFU/100mL)	10% Upper Limit (CFU/100mL)
Freshwater Primary (RWC)	Fecal coliform	100	200
Freshwater Extraordinary (RWC)	Fecal coliform	50	100
Marine Primary (RWC)	Fecal coliform	14	43
WQI	E. coli	100	320

***Note:** Recreational Water Contact (RWC) Criteria in Washington State for both Freshwater and Marine Primary Contact waters were altered in 2021 (173-201A WAC), amending both the bacterial indicator used as well as the maximum concentration values (for either geometric mean or 10 percent upper limit concentrations, or both). Criteria for fecal bacteria concentrations in Freshwater Primary waters were amended to match those of the WQI standard (See Table C-1) and Marine Primary waters amended to use Enterococci as the bacterial indicator with a geometric mean of samples not exceeding 30 CFU (or MPN)/100mL and the 10 percent upper limit of samples not exceeding 110 CFU (or MPN)/100mL. The team used the updated criteria when possible and used the old criteria for marine water analyses due to the change in bacterial indicator and lack of historic data.

[38] Washington State Department of Health, Office of Environmental Health and Safety. 2025. Commercial Shellfish Map Viewer. Available here.

[39] Thurston County Public Health and Social Services Department, Environmental Health Division; Thurston County Community Planning and Economic Development, Stormwater Program. 2020. Thurston County Water Resources Monitoring Report 2018-2019 Water Year.

Fecal coliform data were analyzed from samples collected over five water years (2017/2018 to 2021/2022) from the monitoring sites of seven different water bodies across the county, including: Scatter Creek, Deschutes River, Totten Inlet, Eld Inlet, Budd Inlet, Henderson Inlet, and Nisqually Reach. Compliance limits for FC concentrations vary amongst water bodies and their associated monitoring stations depending on the RWC classification of each location.

Figure C-8 shows the FC concentrations for water bodies subject to Recreational Water Contact (RWC) water quality standards for Freshwater Primary Contact waters (100 CFU/100mL) over a four-year period from Water Year 2017-2018 through 2020-2021. (Water Years are recorded annually from October 1 to September 30). Water bodies within Freshwater Primary Contact designations for which data is shown include Scatter Creek, Deschutes Falls, and Eld Inlet. As shown in the graph, all three water bodies show annual geometric mean concentrations of FC within the compliance limit of Freshwater Primary standards.

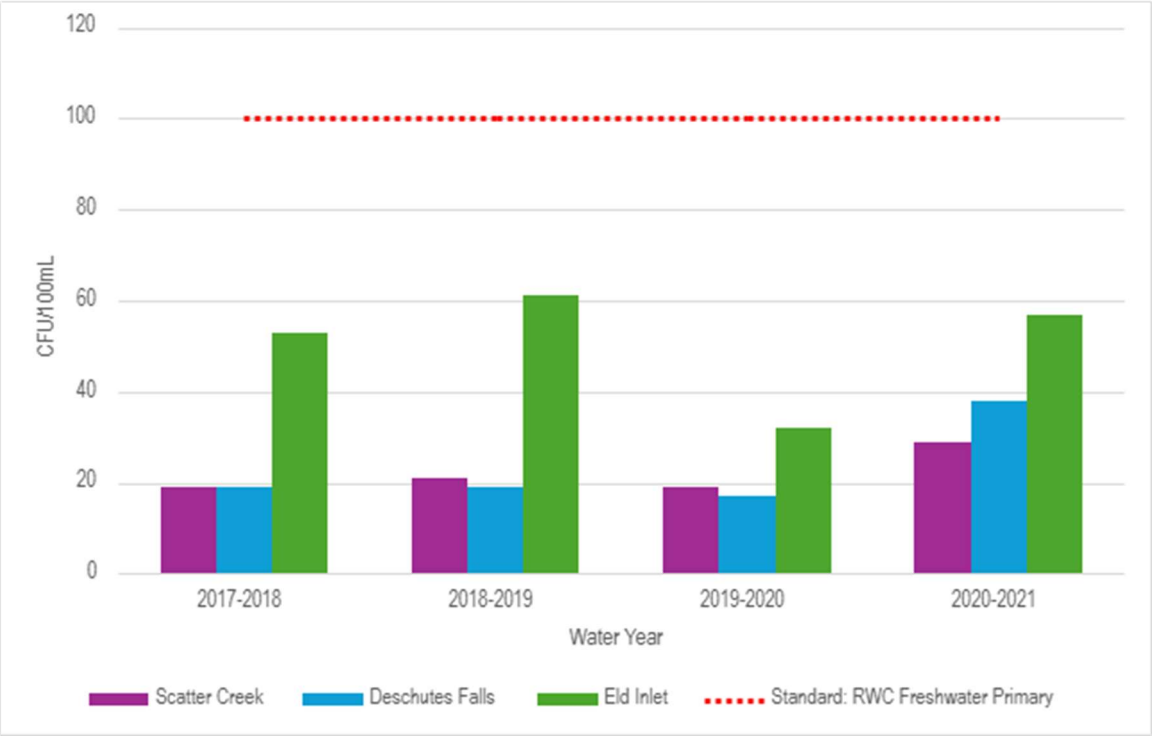

Figure C-8. Geometric Mean FC in RWC Freshwater Primary Contact Waters

Figure C-9 illustrates FC data for Thurston County water bodies under the designation of RWC Freshwater Extraordinary Contact waters, wherein the geometric mean of fecal coliform concentration results for a location cannot exceed 50 CFU/100mL. Data is displayed over a four-year period from Water Year 2017-2018 through 2020-2021 for the waters of Totten Inlet, Henderson Inlet and Nisqually Reach. Out of the three water bodies analyzed only Henderson Inlet exhibits FC concentrations violating RWC standards for Freshwater Extraordinary Contact, with three out of the four total sample years logging above 50 CFU/100mL (WY 2018-2019 even showing FC numbers exceeding this limit by over 100 CFU/100mL).

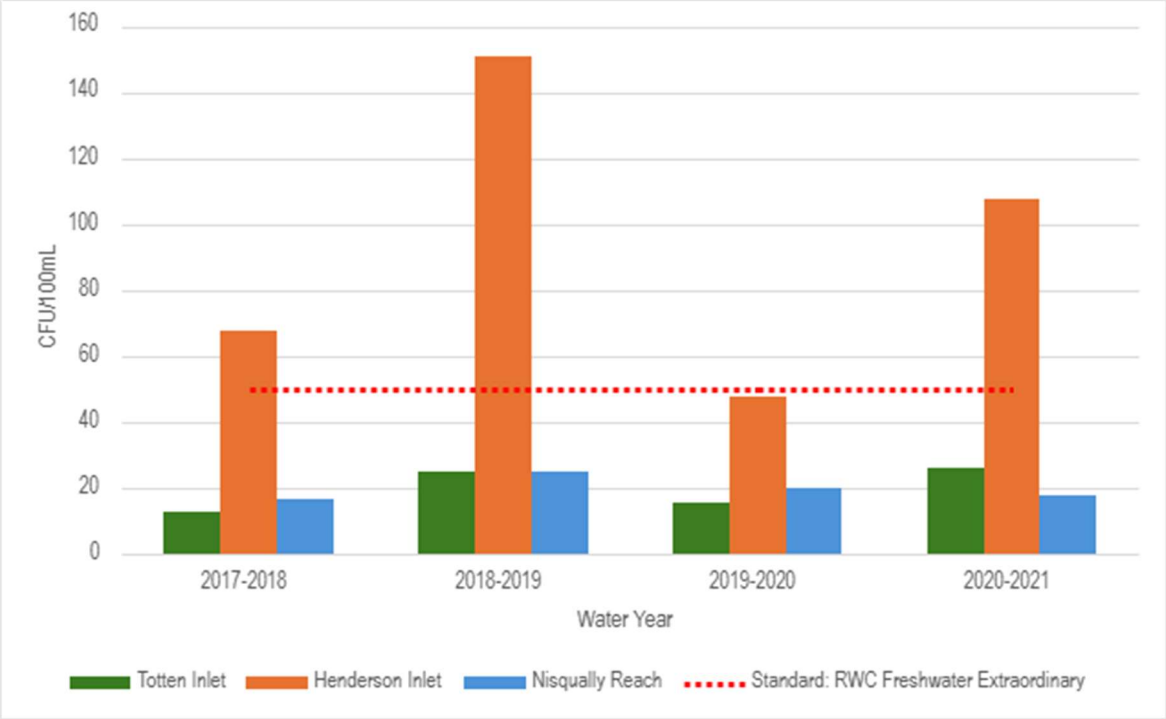

Figure C-9. Geometric Mean FC in RWC Freshwater Extraordinary Contact Waters

Figures C-10 and C-11 display FC data trends from three marine water sampling stations in Henderson Inlet (Stations 186, 187 and 189), sourced from the DOH Commercial Shellfish Map Viewer. The interactive web map details historical FC data for marine water sampling stations across counties containing commercial shellfish growing areas, with over 100 stations in Thurston County across the Totten, Eld, Budd and Henderson Inlets and Nisqually Reach (See Figure C-12). The selected stations are located within areas designated as "Conditionally Approved" (Stations 187 and 189) or "Prohibited" (Station 186) for commercial shellfish growing, as such designations indicate sites where the results of regular water quality testing have consistently violated standards for approval ("Conditionally Approved" areas demonstrating pollution only at predictable times of year).[40] Given their location within shellfish growing areas, all sampling stations are within RWC Marine Primary Contact waters and thus subject to FC compliance limits of: a geometric mean not exceeding 14 CFU/100mL and the 90th percentile of sample data not exceeding 43 CFU/100mL.

All three sampling stations were within compliance limits for geometric mean standards for the last three water years; however, all stations demonstrated 90th percentile FC concentrations exceeding compliance limits at least once over this same time period. In order to be approved as meeting the RWC Marine Primary Contact standards, both sets of criteria must be met. As a result of these requirements, Station 186 did not receive RWC Marine Primary Contact approval for any of the three water years listed, Station 187 was approved for water year 2023-2024, and Station 189 was approved for the water years 2021-2022 and 2023-2024 (See Table C-2). The designation of approval/disapproval of water sampling stations shown by the Commercial Shellfish Map Viewer in Figure C-12 categorizes stations

[40] Washington State Department of Health. 2025. Shellfish Growing Areas. Available here.

based on the last 30 samples taken and thus may not represent the results of the data used in this report.

Figure C-10. Geometric Mean Fecal Coliform in Henderson Inlet MRA

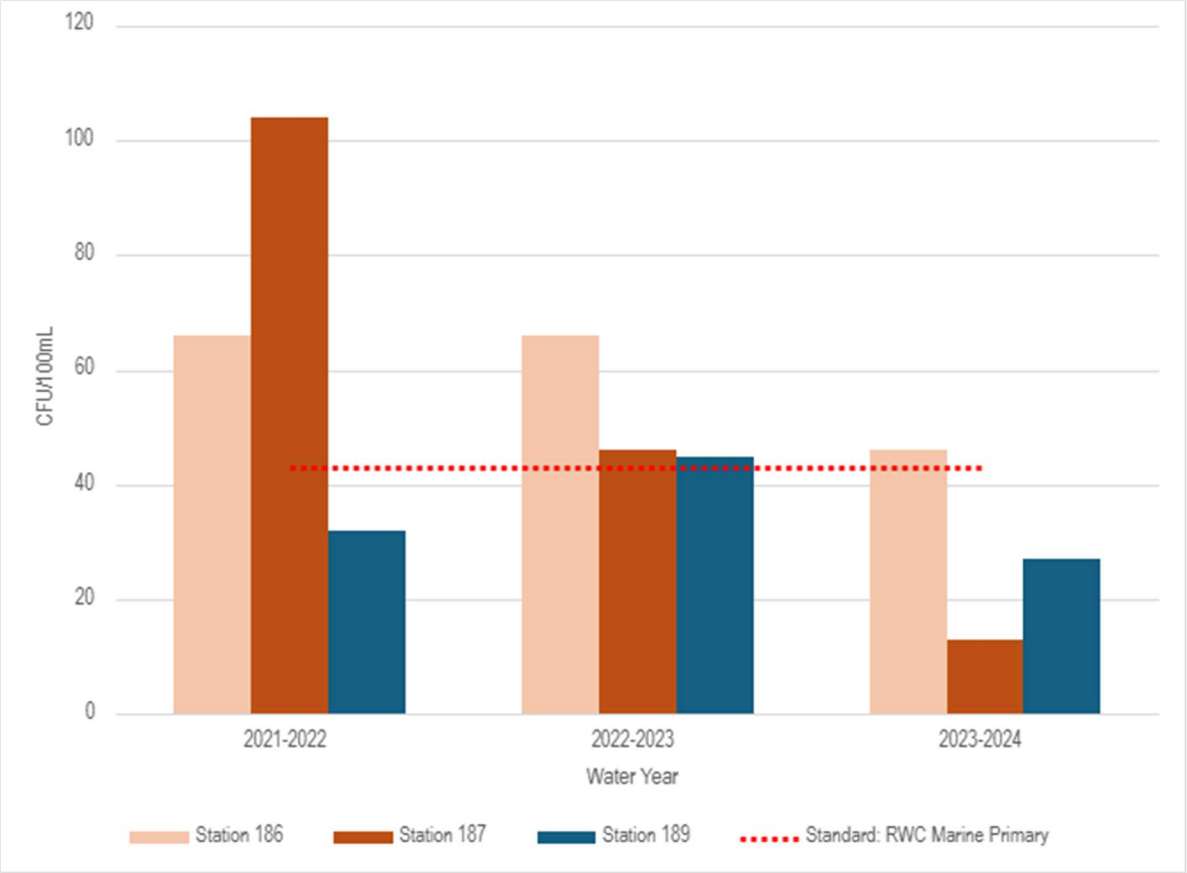

Figure C-11. 90th Percentile Fecal Coliform in Henderson Inlet MRA

Table C-2. Henderson Inlet MRA Sample Station Fecal Coliform Criteria Performance (Approved = Passed Both Criteria)

Sampling Station #	Water Year 2021-2022 (Geometric Mean/90th Percentile)	Water Year 2022-2023 (Geometric Mean/90th Percentile)	Water Year 2023-2024 (Geometric Mean/90th Percentile)
186	(Pass/Fail)	(Pass/Fail)	(Pass/Fail)
187	(Pass/Fail)	(Pass/Fail)	Approved
189	Approved	(Pass/Fail)	Approved

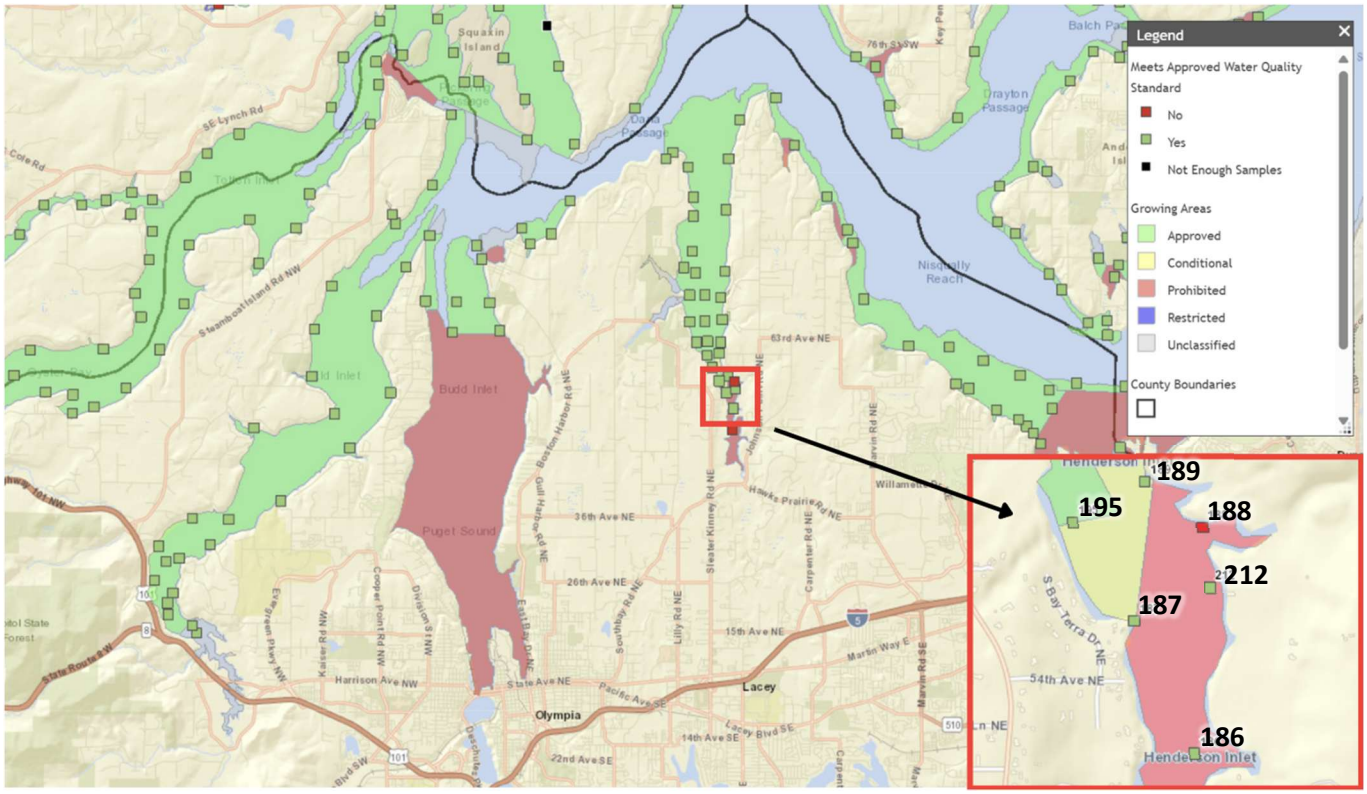

Figure C-12. Marine Water Sampling Stations in Thurston County

APPENDIX D

Enforcement Review

The county has a policy in place that provides guidance on the county's response to public complaints, agency referrals, and certified OSS professional reports alleging OSS concerns. To prioritize issues with the greatest potential impact to public health, the county created four levels of concern, with one being the most urgent. There are different contact and action sequences for each priority level of concern. The correction timeline also varies with the severity of the issue. For imminent safety concerns or sewage surfacing or backing into the home, the correction timeline is immediate. For enlisting the assistance of a service professional, the correction timeline is two weeks. For a minor repair, the correction timeline is two months. For a failure (non-minor repair), the correction timeline is ten months.

> **Priority one** cases include reports of surface sewage or sewage discharge and reports of broken or missing septic pipe, component, lids, or broken tops of tanks. In these cases, within three business days, two in-person visits will ensue, leaving a door-hanger requesting that owners make contact within 24 hours. The next steps are to mail a notice of violation, and if staff cannot gain access to confirm the violation or a violation is occurring inside a dwelling or is subsurface, send a contact request letter requesting a response within two business days. If no response is received and sufficient evidence of violation is present, staff will mail another notice of violation for 'failure to follow the direction of the health officer'. If the complaint is not confirmed, the matter is dropped.
>
> **Priority two** cases include reports of sewage backing up into a residence or structure, groundwater or surface water degradation from inadequately treated effluent, a failing septic system, non-functional or faulty pump components, an adult family home/food establishment/childcare facility connected to an unpermitted use, or people occupying a property without an approved means of sewage disposal. In these cases, within six business days, two in-person visits will ensue, leaving a door hanger requesting that owners make contact within 24 hours. The next steps are to mail a notice of violation, and if staff cannot gain access to confirm the violation or a violation is occurring inside a dwelling or its subsurface, they send a contact request letter requesting a response within four business days. If no response is received and sufficient evidence of violation is present, then staff will mail another notice of violation for 'failure to follow the direction of the local health officer'.
>
> **Priority three** cases include reports of non-functional or faulty alarms, cancelled/expired repair permits, unpermitted repairs to tanks, repairs to undersized tanks not allowed by policy, or under permitted systems. In these cases, within 12 business days, staff will mail a letter requesting contact and repair within 30 days. Staff will confirm the repair or correction, and if no response is received after 30 days, then the system is placed in non-compliance status.
>
> **Priority four** cases include reports of systems with extra bedrooms, structures being built over OSS components, no record drawing, unpermitted "improvements" to OSS components that don't negatively impact treatment requirements, or reports indicating a drainfield is not fully accepting effluent. In these cases, under no strong timeline, staff will mail a letter detailing alleged violations, requesting voluntary corrections and describing the risk the violation poses to the OSS. The letter shall provide resources like CRAFT3 and the Designer list.

Using data from the Black Lake Pollution Identification and Correction Project, which is ongoing, the graph below identifies compliance rates associated with enforcement actions. The project encompasses 697 OSS owners. As of August 2025, 575 of these households have reached compliance. There are still

122 not compliant owners. The county has sent postcards, letters, and conducted site visits to the noncompliant households, and are currently in the process of conducting additional compliance actions (notice of violations, notice of civil penalties, and further legal action). The county will continue to enact its enforcement procedures until all these owners comply. The projected completion date for the Black Lake PIC project is June 2026.

Figure D-1 considers owners that have thus far complied thanks to the Black Lake project efforts. After a postcard, a letter, and an attempted site visit, nearly 62 percent of OSS owners have complied. After an additional attempted weekend site visit, 83 percent of owners have complied. Site visits include providing educational material to the owner and an explanation of regulations. This highlights the effectiveness of enforcement actions and site visits in particular.

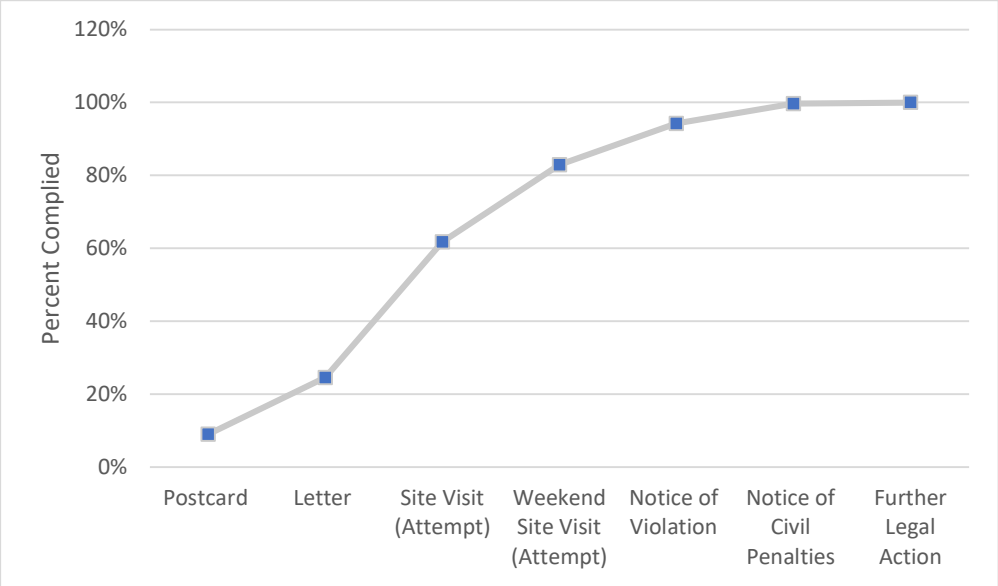

Figure D-1. Black Lake Project Compliance by Enforcement Step

Thurston County implements a robust enforcement policy, carrying out detailed and systematic actions as described above. Based on the Black Lake Pollution Identification and Correction Project, compliance rates are high after one or two site visits. Expanding this enforcement policy countywide, alongside a strengthened operations and management program, could further improve compliance rates across the region.