Nisqually Reach Watershed Protection Area
Onsite Sewage System Operation & Maintenance Program
2013-2022 Review

April 2023

Evaluation conducted by Tracy Hall as part of her Master of Public Health Program

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WASHINGTON
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EXECUTIVE SUMMARY

Commercial shellfish growing areas within Nisqually Reach were downgraded and classified as unapproved in 2000 by the Washington State Department of Health due to deteriorating water quality. The classification downgrade meant Thurston County was then subject to state laws requiring the pollution be addressed. Pollution associated with land use, stormwater, and animal waste was addressed through different programs that will not be discussed here. Fecal coliform pollution associated with onsite sewage systems (aka septic systems) was addressed through the development and implementation of the Nisqually Reach Watershed Protection Area Onsite Sewage System Operation & Maintenance Program (NRWPA OSS O & M Program).

The program elements were based on recommendations from the Nisqually Reach Shellfish Protection District Stakeholder Committee and state requirements. Program elements include monitoring, a risk based approach to septic system evaluation, routine inspections, and maintenance and repairs when needed for septic systems within the Nisqually Reach Marine Recovery Area. The program was implemented January 1, 2013 and continues until the sunset date of December 31, 2023.

As of December 2022, there were 4,735 septic systems (as represented by operational certificates) being monitored within the program area, of which 4,400 are ranked as low risk and 335 are ranked as high risk. Both low and high risk systems require regular inspections in accordance with their operational certificates. High risk systems have an additional requirement of a dye test evaluation every 6-9 years. Dye test evaluations over the last 10 years have found 7% of the high risk septic systems to be failing and directly contributing fecal coliform pollution.

Although many property owners require several reminders that an inspection is needed, the property owners within the program area have been diligent and an impressive 89% are current with required inspections and any needed maintenance and/or repairs. Although minor repairs are not required to be reported, 1,344 minor repairs have been reported. More complex repairs require a permit and 161 permitted repairs have been completed. Of the property owners within the program area, 1,035 have attended 1 of the 127 self-inspection workshops offered by Thurston County Environmental Health staff, allowing property owners to inspect their own septic systems and submit the report at no additional cost.

The efforts of the property owners, septic professionals, and Environmental Health staff have led to a decline in fecal coliform pollution, despite an increase in population and development within the program area. The goals of this program to protect public health and improve water quality within Nisqually Reach are being met. Because the water quality has improved, the classification of 127.3 acres of commercial shellfish growing areas have been upgraded to approved. Additionally, water quality standards are being met at all marine sampling stations within Nisqually Reach at this time.

As maintaining water quality requires continued diligence, long-term commitment, and public involvement, continuation of the effective NRWPA OSS O & M Program and maintaining the marine recovery area designation are recommended. Continuation of the NRWPA OSS O & M Program will ensure that water quality degradation from onsite sewage systems will continue to be addressed or prevented, improvements in marine water quality will be maintained, and water quality standards met for commercial shellfish harvesting. This successful program and the marine recovery area designation will terminate on December 31, 2023 unless re-enacted by the Board of Health and Board of County Commissioners.

TABLE OF CONTENTS

INTRODUCTION

Two ordinances, Ordinance No. H-1-2012 and Ordinance No. 14713, were adopted by the Thurston County Boards of Health and County Commissioners on February 14, 2012. These ordinances created the Nisqually Reach Watershed Protection Area and established the program boundary, program goals and elements, and rates and charges to fund program activities. The Nisqually Reach Watershed Protection Area (NRWPA) Onsite Sewage System Operation and Maintenance Program was then implemented on January 1, 2013.

The goal of the program is to protect public health and improve water quality within Nisqually Reach by reducing pollution from septic systems. The main elements of the program were recommended by the Nisqually Reach Shellfish Protection District Stakeholder Committee and include regulating the operation and maintenance for all septic systems within the NRWPA boundary and using a risk based system to evaluate and ensure septic systems are properly treating sewage. According to state law, operation and maintenance in these types of programs must include monitoring, inspection, and repair elements.

The Nisqually Reach Watershed Protection Area was designated as a marine recovery area and an area of special concern. These designations and this program will terminate on December 31, 2023, unless re-enacted by the Board of Health. This document is an evaluation of the Nisqually Reach Watershed Protection Area Onsite Sewage System Operation and Maintenance Program from 2013-2022 to be submitted to the Board of Health and the Shellfish Protection District Advisory Committee.

BACKGROUND

Many decisions and conditions over the years led to the need for this Onsite Sewage System Operations and Maintenance Program. In 1992, the Washington State legislature published their findings regarding water pollution and shellfish harvesting, which stated “The legislature finds that shellfish harvesting is important to our economy and way of life. Washington state is an international leader in the cultivation and production of shellfish. However, large portions of the state’s productive recreational and commercial shellfish beds are closed to harvesting, and more are threatened, because of water pollution. The legislature finds that the problem of shellfish bed closures demands a public policy solution and that the state, local governments, and individuals must each take strong and swift action or this precious resource will be lost.” The legislature also found that failing onsite sewage systems were a significant cause of shellfish bed closures and local health departments should be utilized for remedial action (RCW 90.72.030 Findings – 1992 c 100).

When the Washington State Department of Health downgraded the classification of 74 acres of commercial shellfish growing area in the Nisqually Reach in 2000 due to water quality degradation, state law (RCW 90.72.045) directed the County to create a shellfish protection district and establish a shellfish protection program. Shellfish protection district programs must include monitoring, inspection, and repair elements to ensure that onsite sewage systems are adequately maintained and working properly (RCW 90.72.030 2007 c 150). Additionally,

because onsite sewage disposal systems were a significant factor in the shellfish growing area downgrade, state law (RCW 70.118A) directed the County to designate a marine recovery area and establish a program to find and fix failing systems. Thus, the County needed a shellfish protection district, marine recovery area, and a program for septic systems within the Nisqually Reach Watershed that included monitoring, inspection, repair, and finding failing systems.

For all onsite sewage systems, even those outside of shellfish protection district programs, the Washington Administrative Code states that owners are responsible for a complete evaluation of their onsite sewage system to determine functionality and maintenance needs every three years for a gravity system and every year for all other systems (WAC 246-272A-0270).

The Board of County Commissioners recognized that improving and maintaining the water quality of the Nisqually Reach would require diligence, a long-term commitment, and continued public involvement, leading them to adopt Ordinance No.12680 on December 17, 2001, which created the Nisqually Reach Shellfish Protection District, established its boundaries, and adopted a shellfish protection program. A shellfish district stakeholder committee was formed to advise the Board of County Commissioners and City Councils.

Thurston County worked with the Nisqually Reach and Henderson Inlet Shellfish Protection Districts' Stakeholder Committees and staff from Thurston Conservation District, City of Lacey, City of Olympia, Puget Sound Action Team, Washington State Department of Ecology, and Washington State Department of Health to develop a work program to address the water quality in Nisqually Reach. The "Henderson Inlet and Nisqually Reach Shellfish Protection Districts Implementation Work Plan" included septic system, stormwater, agricultural, land use, and wildlife recommendations. The septic system recommendations included the following actions:

- Declare the district as an "Area of Special Concern" for septic systems;
- Require operational certificates and an operational and maintenance program;
- Dye test all shoreline parcels every 6 years;
- Perform follow-up inspection of new systems 6 to 12 months after installation;
- Implement a risk based O&M program for Henderson Inlet then expand to Nisqually;
- Provide low interest loans regardless of income for repair of failing systems;
- Continue and possibly expand the education and outreach program;
- Reestablish the District boundary based on surface water that influences the water quality of shellfish beds in the Nisqually Reach and McAllister Creek areas.

GOALS

The goals of this program are to protect public health and improve water quality within Nisqually Reach by addressing water quality degradation resulting from onsite sewage systems. Continued achievement of these goals will ensure that marine water quality is maintained and the shellfish growing areas meet the state and federal marine water quality standards for commercial shellfish harvesting. The program goals are expected to be achieved through the combined efforts of onsite sewage system owners within the Nisqually Reach Watershed Protection Area,

septic professionals certified to work in Thurston County, and Thurston County Public Health and Social Services Environmental Health Division staff.

Actions to meet program goals include regular septic system inspections in accordance with the septic system's operational certificate, the performance of maintenance and repairs when needed, and the identification of failing septic systems followed by repair, replacement, or sewer connection. Systems not in accordance with their operational certificate will be labeled as nonconforming with subsequent passive or active compliance measures. Failure of septic systems will be identified through regular inspections, complaints, deficient septic professional reports, and the permit review process. High risk septic system failures will also be identified through routine dye testing.

The original program goals included several elements to review to determine whether program goals are achieved: the water quality at the Washington State Department of Health marine sampling stations within the Nisqually Reach, the Washington State Department of Health commercial shellfish growing area classifications, and the number of septic systems that have current operational certificates. The program is considered a success if the water quality standard continues to be met in approved shellfish growing areas, if the water quality improves in unapproved shellfish growing areas, if the number of acres approved for commercial shellfish harvesting is maintained or increases, and if there is an increase in the number of septic systems with recent inspections and maintenance (septic systems with a current operational certificate).

PROGRAM DEVELOPMENT

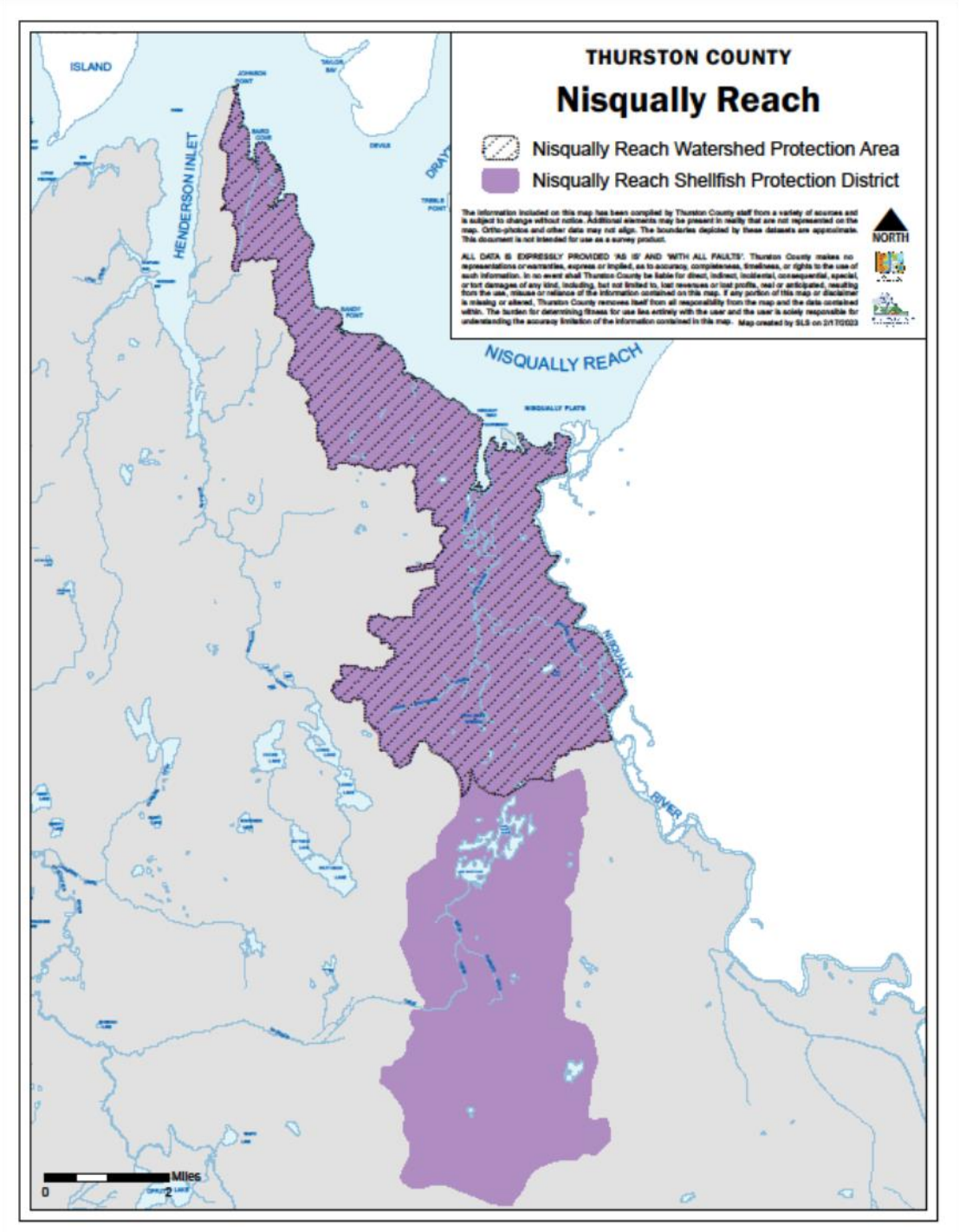
Grant funding was obtained for further development of the Nisqually Reach Watershed Protection Area Onsite Sewage System Operation and Maintenance Program from 2009 to 2012. During this time public workshops and public hearings were held, property owners within the program boundary were notified, and many tasks were accomplished. Accomplishments included the establishment of the boundary area for parcels to be included in the program, determination of high or low-risk level for each septic system, creation of operational certificate and dye test guidelines, establishment of an electronic reporting system, and determination of rates and charges to cover program costs. The program was based on the successful Henderson Inlet Watershed Protection Onsite Sewage System Operation and Maintenance Program which was implemented in 2007.

Program Boundary

The Nisqually Reach Watershed Protection Area boundary is a portion of the Nisqually Reach Shellfish Protection District that was determined to be most likely to impact the water quality in the Nisqually Reach. The area south of McAllister Creek was excluded from the program due to the hydrologic characteristics of the sub-basin; the area was not likely to significantly contribute to bacterial pollution in Nisqually Reach. See Figure 1 for a map showing both boundaries. If any portion of a parcel is within the boundary, the entire parcel is considered to be within the program area. If any portion of a septic system is within more than one watershed protection

area, the system will be subject to the requirements of only one watershed protection area according to policy.

Figure 1. Map of the Nisqually Reach Watershed Protection Area (program area) Within the Nisqually Reach Shellfish Protection District



Risk Level

All septic systems within the Nisqually Reach Watershed Protection Area are ranked as either high or low-risk. The risk level was determined by soil type, proximity to marine water or McAllister Creek, and neighborhood criteria, such as drainage and historic septic issues. The high-risk designation means that if the septic system failed it would pose a high-risk to public health by contributing to water quality degradation. The low-risk designation means that if the septic system failed it would pose a lower risk to public health and would be less likely to contribute to water quality degradation. See Appendix C for the link to Thurston County Permitting System Policies and Procedures Number ONST.12.POL.849.

Operational Certificates

An operational certificate (OPC) was issued to new systems after the septic system had a final inspection and the record drawing was received. OPCs were issued to preexisting septic systems after meeting OPC guidelines once the program was implemented. After initial OPC issuance, the OPC needs to be renewed on prescribed schedules. The majority of septic systems are on a three-year renewal cycle. Systems requiring annual renewal include Glendon Biofilters one year after install, other systems with proprietary treatment products, systems with disinfection, community systems, food establishments, schools, and systems with drip line distribution. Systems requiring renewal every three years include all other systems, Glendon Biofilters after initial renewal, and sewage tanks with two connections and community system components that serve only one or two residential units. The requirements for renewal include routine inspections and maintenance and submission of inspection reports to the County, with the additional requirement of completed routine dye tests for high risk properties.

The routine inspections and maintenance must include all components of a system. If the inspection found any maintenance or repairs that need to be performed, those tasks must also be completed. Maintenance includes tasks such as pumping the scum and sludge from the tanks when the solids are one-third or more of the working depth of the tank, cleaning the effluent filter, and removing roots from septic components. Repairs include minor repairs and permitted repairs. Examples of minor repairs include replacing the outlet baffle, patching tank cracks, replacing the pump, etc. Permitted repairs include tank replacement and installing new drainfields.

Inspections must be completed by Thurston County certified septic professionals, i.e., pumpers, installers, and monitoring specialists. Additionally, owners of properties within the NRWPA may be trained and certified by the county health department to inspect their septic systems for operational certificate renewal if the system is a conventional gravity system, conventional pressure distribution system, mound system, Glendon system, and not serving a food establishment. Homeowners may lose their certification if they fail to perform and report an inspection, fail to complete needed maintenance and/or repairs, file an incomplete inspection, or falsify an inspection report.

If the system is not failing, an inspection has been completed, and any needed maintenance or repairs have been completed, and when applicable the dye test has been completed, then the

operational certificate is issued and the septic system is considered in compliance. Septic system failure is defined in the Thurston County Sanitary Code, Article IV, as a condition of an onsite sewage system or component that threatens the public health by inadequately treating sewage or by creating a potential for direct or indirect contact between sewage and the public. Examples of failure include:

- Sewage on the surface of the ground
- Sewage discharged directly to surface water or upon the surface of the ground
- Sewage backing up into a structure caused by slow soil absorption of sewage tank effluent
- Sewage leaking from a sewage tank or collection system
- Inadequately treated effluent contaminating ground water or surface water
- Surface or ground water intrusion into a sewage tank or collection system
- Cesspools
- Seepage pits where evidence of ground or surface water quality degradation exists
- Metal sewage tanks that have any rusted through, perforated or damaged parts
- Noncompliance with standards stipulated on the permit or design

Dye Tests

Dye testing is highly effective at identifying shoreline and waterfront septic systems that are leaking untreated or partially treated sewage into surface water, allowing 'short circuits' in the system to be located, which may not be visible during physical inspection. High-risk septic systems require a dye test evaluation, in addition to an inspection and any needed maintenance or repairs, as a condition of the operational certificate. Thurston County Environmental Health staff review and dye test properties on a schedule that coincides with the operational certificate due date. At the time of program development and initial implementation, dye tests were required every six years.

The dye tests are performed according to strict policies and procedures over a four-week period. To be considered a failing septic system, dye must be present at a site at least ten times greater than the background level and a water sample collected at the dye positive site within 6 months of the dye must have a fecal coliform bacteria present at or above 200 organisms per 100 mL or above established background concentrations. Failing septic systems are required to be repaired or replaced. Properties with dye detected and either fecal coliform bacteria sample results below 200 organisms per 100 milliliters (mL) or no water sample was able to be collected are considered dye positive and recommendations are made to the homeowner to work with a septic professional to further investigate and diagnose the issue.

Electronic Reporting System

To have access to an electronic reporting system for inspection and pumping report submittal, Thurston County began utilizing OnlineRME (Online Responsible Management Entity). Many counties throughout Washington State also use OnlineRME to receive septic professional pumping reports and inspection reports. The services are covered by a small fee paid by the

service professionals. Pumping reports are required to be uploaded by septic professionals to www.OnlineRME.com where Environmental Health staff and the public can view the reports. For properties requiring an operational certificate, including all properties in the NRWPA, inspection reports are also required to be uploaded. Some report information from OnlineRME is transferred nightly to the county permit tracking system.

Rates and Charges

The Board of County Commissioners adopted Ordinance No.14713, which amended the Nisqually Reach Shellfish Protection District boundaries, consolidated the work program for both marine recovery areas (Henderson and Nisqually), and set the rates and charges to provide a stable source of funding for the onsite sewage system operation and maintenance program. Washington state law (RCW 90.72.070) authorizes the Board of County Commissioners to finance activities specified in the shellfish protection program through reasonable fees or rates and charges. The annual rates and charges began January 1, 2013 and applied to those properties with an onsite sewage system within the Nisqually Reach Watershed Protection Area. In 2013 the rates and charges were as follows:

- $60 per single family residence or unit volume of sewage (UVS), plus an additional $10 for every additional residential unit or UVS
  or
- $135 per single family residence or UVS served by a high risk onsite sewage system, plus $10 for every additional residential unit or UVS
- $145 for each COSS dispersal component located off-site from where the sewage originates
- $145 for each food establishment and school, except those served by a large onsite sewage system

For each subsequent year, the rates and charges were automatically adjusted on January 1 by the percentage increase, if any, in the June Consumer Price Index for the previous year, with a maximum increase of 3.5%. All adjustments to the rates and charges are rounded to the nearest whole dollar. The rate and charge is included on the property tax bill and listed as “Shellfish Protection Nisqually”. For any parcel owned by a person granted a Senior/Disabled Exemption, the rate and charge is reduced by 100%.

The rates and charges supply the funding needed to cover the majority of the program elements (see Program Implementation). To ensure fairness, financial assistance and the riser rebate program (incentive) are funded by other sources.

PROGRAM IMPLEMENTATION

With clear goals, established program elements, and a secured, stable source of funding, the Nisqually Reach Watershed Protection Area Onsite Sewage System Operation and Maintenance program began January 1, 2013. The program elements include:

- Monitoring all septic systems within the program area

    - Maintain a County database of tax parcels that includes:
        - Septic system components
        - Status of operational certificate
        - Operational certificate frequency
        - Renewal cycle due date
        - Risk level
        - Dye test years
        - Date of inspection
        - Date of pumping
        - Amount of scum and sludge measured
        - Noted deficiencies on septic reports
        - Links to septic reports
        - Reported minor repairs
        - Repair permits
        - Compliance activities
    - Identify failing septic systems through review of inspections, complaints, deficient septic reports, permit applications, and the dye test process (for high-risk septic systems)
- Routine inspections
    - Send notices reminding all homeowners within the program area when inspections are due (first notice, second notice, nonconforming notice)
    - Send violation notices reminding homeowners that an inspection is past due but still needed and pumping is now required
    - Train and certify property owners with eligible septic systems to conduct their own inspections
    - Receive inspection reports submitted by septic professionals and certified homeowners to the county health department through OnlineRME. Certified homeowners may also submit reports directly to Environmental Health
    - Review septic professional inspection reports, certified homeowner inspection reports, and pump reports if applicable or available
    - Renew operational certificate when reports are satisfactory
    - Complete dye tests for high-risk properties as part of the operational certificate renewal process
    - Conduct QA/QC site visits
    - Enforce compliance to ensure all septic systems are completely inspected
    - Provide incentives and financial assistance
- Maintenance and repairs as needed
    - Send letters notifying homeowners when maintenance and repairs are required as noted by deficiencies on septic professional reports
    - Send letters notifying homeowners that pumping is required when solids reported are one third of the working depth of the septic tank (typically pumping is needed every 3-5 years on average)
    - Conduct QA/QC site visits

- Enforce compliance to ensure all septic systems are maintained and repaired as needed
- Provide incentives and financial assistance

PROGRAM RESULTS

Prior to the program, few existing septic systems were required to be inspected. With program implementation, all septic systems within the Nisqually Reach Watershed Protection Area boundary are required to be monitored, inspected, and maintained as a condition of the septic system's renewable operational certificate.

Incentives and Financial Assistance

To help homeowners comply with the program elements, incentives and financial assistance are available. Incentives include homeowner training and riser rebates. Financial assistance includes a program fee waiver, small grants, and referral to the Craft3 loan program.

Incentive – Homeowner Training: Homeowner training allows homeowners to become certified to inspect their own septic system at no additional cost. As of December 2022, the average cost of an inspection completed by a septic professional was $310 with additional fees if digging to access the tank lids was necessary. Funding for homeowner training is included in the program rates and charges. The septic demonstration park is used for each training workshop, allowing homeowners to see septic components uncovered. The training workshop includes a variety of props, videos, lecture, and multiple teaching methods.

Finding: As shown in Tables 1 and 2, from January 2013 through December 2022, over a thousand NRWPA homeowners attended one of the many workshops offered to become certified self-inspectors. An additional 105 homeowners attended a workshop in 2012 to prepare for the program implementation. Fewer classes were offered in 2020 due to the COVID-19 pandemic, but classes were still able to be offered with social distancing and safety taken into account.

Table 1. Certified Self-Inspector Workshops for Homeowners 2013-2022

Year	Workshops Offered	NRWPA Attendees
2013	21	220
2014	21	191
2015	13	125
2016	10	126
2017	11	124
2018	11	67
2019	10	74
2020	6	30
2021	12	33
2022	12	45
Total	127	1035

Incentive – Riser Rebate: A rebate of $50 is available to homeowners for a new 24-inch diameter septic riser with a lid for an existing septic tank, pump chamber or sandfilter, after proof of purchase and installation. The rebate is limited to $100 per property owner. A septic riser allows for quick access to the septic components making routine inspections and maintenance easier and less costly. Funding for the riser rebates is from other sources.

> **Finding:** As shown in Table 2, during 2013-2022 homeowners received rebates for 643 new risers for a total of $32,150 back to homeowners; making hundreds of septic components easier to inspect and maintain.

Financial Assistance – Waiver: For seniors and disabled property owners who are enrolled in the county property tax exemption program, 100% of the program charge is waived.

> **Finding:** As shown in Table 2, there were 251 Senior/Disabled Tax exemptions granted to homeowners from 2013-2022.

Financial Assistance – Small Grants and Referral: Small grants are available to low-income property owners to help with the cost of inspections and maintenance. Once approved, the grant pays the septic professional up to $500 and will cover 75% of the cost of inspection, maintenance, riser installation, and minor repairs. Funding for the small grant program is from other sources. Additionally, low-interest loans are available through Craft3 to fund repair or replacement of failing septic systems. Craft3 is a nonprofit community development organization that provides hundreds of loans to homeowners throughout Washington every year.

> **Finding:** As shown in Table 2, during 2013-2022 small grants were approved for 99 low-income homeowners, paying $32,086.13 for septic inspections, maintenance and/or repairs on behalf of homeowners.

Table 2. Financial Incentives and Assistance for Homeowners 2013-2022

	Incentives & Assistance			
	Self-Inspectors Certified	Tax Exemption Program Charge Waiver	Riser Rebates	Small Grants
# in NPWPA	1,035	251	643	99
Amount Paid	N/A	N/A	$32,150	$32,086.13

Monitoring

Parcels and associated operational certificates were added to the program when septic systems were newly installed or discovered and removed from the program when converted to city sewer or when septic systems were properly abandoned. Risk level is determined when properties are added to the program.

Finding: As shown in Table 3, in the first year of the program the number of septic systems in the NRWPA, as represented by operational certificates (OPCs), was 4,263 and continuously increased over time to be 4,735 by the end of 2022; this is an 11% increase.

Table 3. Number of Operational Certificates per Tax Roll Year

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
OPCs	4,263	4,283	4,339	4,352	4,397	4,482	4,580	4,648	4,690	4,716

Finding: As shown in Table 4, at the end of the 2022 calendar year, there were a total of 4,735 septic systems in the NRWPA, as represented by OPCs, with 4,400 (93%) ranked low-risk and 335 (7%) ranked high-risk.

Table 4. Number of Operational Certificates and Risk Level at the End of 2022

Risk Level	Count	%
Low-Risk	4400	93%
High-Risk	335	7%
Total OPCs	4735	100%

Please note the discrepancy in OPC numbers on Table 3 and Table 4 associated with 2022 is based on timing of data collection. 4,716 OPCs were on the tax roll for 2022 meaning the data was collected at the end of 2021 and when data was collected for this evaluation at the end of 2022, an additional 19 OPCs had been added, for a total of 4,735. Yearly tax roll data is used for consistency in year-to-year comparisons.

Operational Certificate Notices

Homeowners are sent reminder notices on a prescribed schedule when an inspection is needed in order for their operational certificate(s) to be renewed. Most septic systems are on a three-year inspection cycle; thus, most property owners will receive a reminder notice every three years. To evenly distribute the workload for Environmental Health staff and septic professionals, the initial septic systems were divided up so that each property owner would receive a notice during the first three years of the program and then every three years after.

The county permit tracking system, AMANDA, is used to track OPC renewal due dates, notices, compliance, and much more. The first reminder notice is sent 60 days before the expiration of the current OPC. If an inspection report is not received, then the second notice is sent 30 days after the expiration of the OPC. If an inspection report is still not received, then the third and final reminder, the nonconforming notice is sent 60 days after the expiration of the OPC. The septic system will automatically be flagged in AMANDA as non-conforming 120 days after OPC expiration. No other permits can be issued until the septic system and its OPC are brought into compliance. Violation reminders are sent at the next renewal cycle after a system becomes nonconforming and every renewal cycle until the system returns to compliance.

Finding: As shown in Table 5, although state law includes the required timing of septic system inspections, many homeowners need reminders to inspect their septic systems.

On average, 34% of homeowners were sent a second notice and 61% of those homeowners were sent a nonconforming notice reminding homeowners that an inspection was necessary.

Table 5. Type and Quantity of Notices Sent 2013-2022

	Notices Sent			
Year	First	Second	Nonconforming	Violation
2013	1191	442	220	2
2014	1187	548	355	1
2015	1081	483	329	20
2016	1380	504	292	131
2017	1277	426	270	136
2018	1150	467	292	82
2019	1453	454	255	178
2020	1297	121	73	151
2021	1219	333	213	114
2022	1465	556	350	153

Operational Certificate Status

Before the program, operational certificates (OPC) and inspection reports were required for very few septic systems. With implementation of the program that drastically changed when OPCs and inspection reports were required for all septic systems within the program boundary. If an inspection and any needed maintenance and/or repairs have been completed, and the additional required dye test has been completed for high risk properties, the OPC is renewed and issued. Inspections completed within the last year are accepted. The county permit tracking system is set up to automatically renew OPCs from electronic report submissions when there are no deficiencies or comments noted.

Homeowners may request additional time to complete the requirements for their operational certificate. Septic systems become classified as nonconforming and do not have a current operational certificate when the required inspection or needed maintenance and/or repairs have not been completed within the time allotted. To bring a nonconforming system back into compliance, the septic system must be inspected by a septic professional, all sewage tanks must be pumped, any needed maintenance and/or repairs must be completed and documented, and an application for reinstatement must be submitted.

Finding: As of spring 2023, 89% of septic systems within the program boundary have a current operational certificate. The majority of septic systems that may impact the water quality in the Nisqually Reach have been inspected, maintained, and repaired. Almost all septic systems within the Nisqually Reach Watershed Protection Area have been inspected at least once. See Figure 2 for map of program area showing parcels with current OPCs as of October 2022.

Maintenance

Pumping to remove solids, the scum and sludge layers, from the tank(s) is the most common maintenance required for septic systems. For the average household, pumping is needed every 3-5 years. The general rule is that septic tanks need to be pumped when solids have accumulated to 1/3 the working depth of the tank, to allow the septic tank(s) to continue to work as designed. The working depth is the distance from the bottom of the tank to the bottom of the outlet. The average modern tank needs to be pumped when 16 inches or more of solids have accumulated. Overaccumulation may lead to solids reaching the drainfield and causing a failure. Scum and sludge levels are measured at the time of inspection and/or pumping and submitted on inspection and pump reports. If the total amount of measured solids exceeds 1/3 the working depth, pumping is required before the operational certificate can be issued.

Finding: As shown in Table 6, during the first cycle it appeared that some homeowners had not been properly maintaining their septic systems by not pumping as frequently as needed as the average amount of solids reported for both inspections and pumping exceeded 16 inches.

Table 6. Average Accumulation of Solids: Pumping Required at 16+ Inches of Solids

Year	Average Solids (inches)	Pumping
2013	16.1	REQUIRED
2014	19.6	REQUIRED
2015	18.9	REQUIRED
2016	13.6	✓
2017	13.5	✓
2018	12.8	✓
2019	12.9	✓
2020	12.5	✓
2021	11.8	✓
2022	12.2	✓

Finding: Many homeowners need reminders about when to maintain their septic system(s). As shown in Figure 3, when comparing the pumping rates in Thurston County between areas that have operational certificates (Nisqually OPC [this program] and County OPC property owners receive inspection reminders and notices when pumping is required) and those that do not, it is clear that reminder letters and pumping required notices help homeowners maintain their septic systems, protecting their investment and public health.

Figure 2. Map of Program Area: October 2022 Compliance Status by Parcel

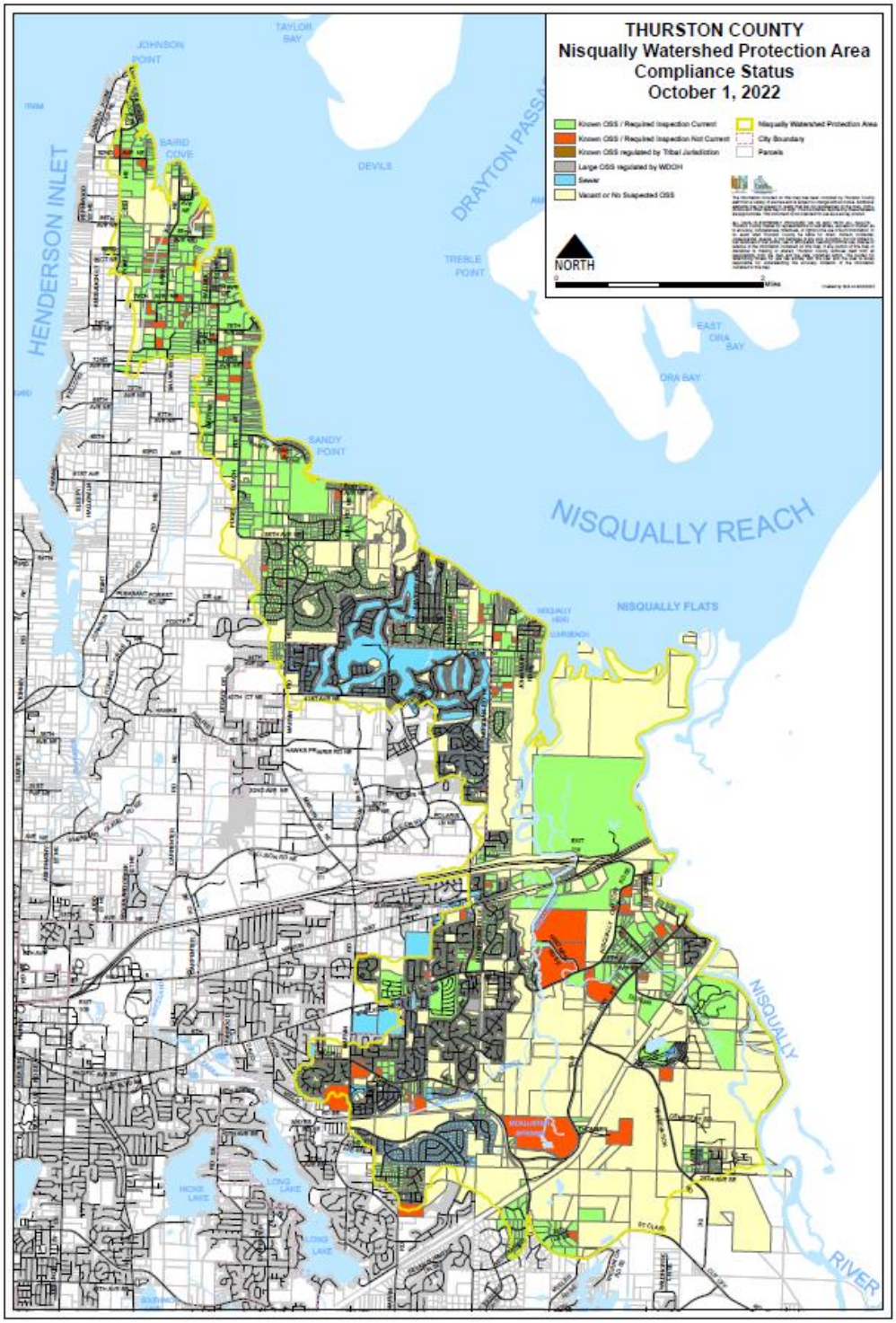
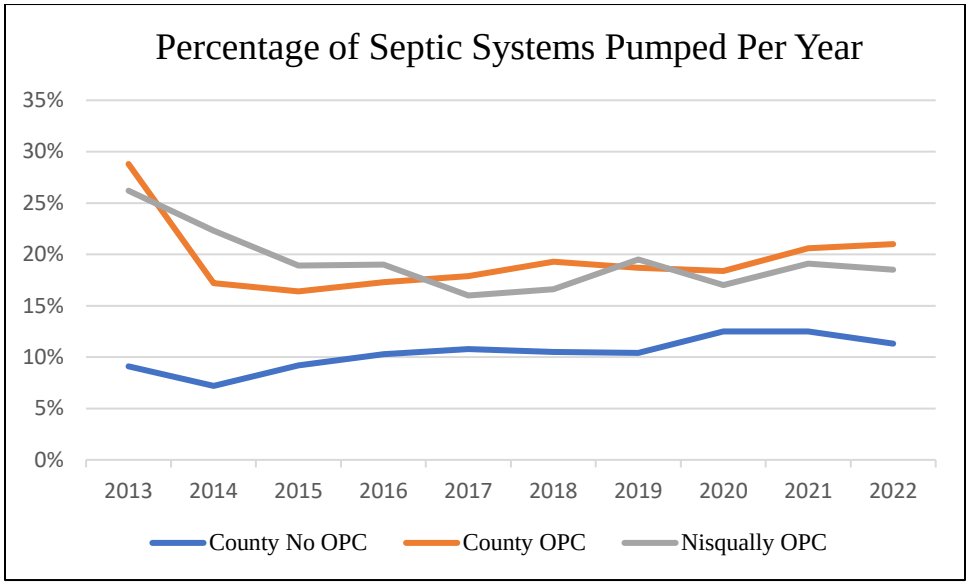


Figure 3. Comparison of Pumping Rates in Thurston County, With and Without OPCs



Minor Repairs

During inspections many issues may be found that can be fixed with a minor repair. Minor repairs are not required to be reported thus are most likely underreported. The Thurston County Sanitary Code, Article IV, includes many components that may be repaired or replaced as a minor repair: tightline pipe between a structure and a sewage tank; tightline between a sewage tank and the dispersal component; a pump; an interceptor drain; sewage tank pumps; pump control floats; effluent filters; pipes connecting multiple sewage tanks; OSS inspection boxes and ports where a sewage tank, treatment component, or soil dispersal component does not need to be replaced; and the replacement of a small section ten feet or less of the subsurface soil absorption system (drainfield) when damaged during an evaluation.

> **Finding:** Septic system issues are common but can be found and repaired as a result of regular inspections. In 2012, before program implementation, only 16 minor repairs were reported. Once the program was implemented and inspections increased, the number of minor repairs reported multiplied. As shown in Figure 4, the number of minor repairs reported was the greatest in the first three-year cycle. This is believed to be due to deferred maintenance and homeowners not following the routine inspection schedule outlined in state law before program implementation. 1,344 minor repairs were reported from 2013-2022.
>
> **Finding:** Several minor repairs are needed more often than others. As shown in Table 7, the most common minor repair was repairing or replacing the outlet baffle, which was reported more than twice as many times as the second most common repair of resealing or replacing the transport pipe.

Figure 4. Minor Repairs Reported per Year

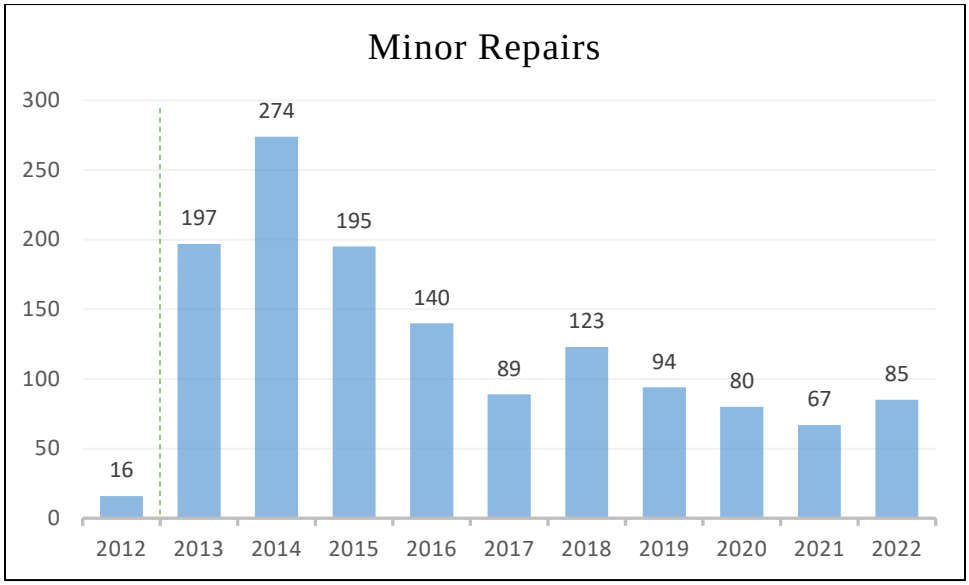


Table 7. Type and Rank of Minor Repair from 2013-2022

Minor Repair	Total	Rank
Outlet Baffle: Repair or Replace	464	#1
Transport Pipe: Reseal or Replace	196	#2
Floats	141	#3
Pump: Repair or Replace	110	#4
Electrical	94	#5
Other: Not Listed	94	#5
Pump Alarm	78	#6
Septic Tank: Crack Repair	66	#7
Inlet Baffle: Repair or Replace	47	#8
Septic Tank: Holes in Bottom	34	#9
Building Sewer	16	#10
Drainfield Tee: Repair or Replace	4	#11
Grand Total Minor Repairs	1344	

Permitted Repairs

When issues cannot be fixed with a minor repair, a permitted repair is required. The Thurston County Sanitary Code, Article IV, defines repair as restoration, by reconstruction, addition to, or replacement of an existing OSS or component of the OSS due to failure or damage. These repairs require a permit. Permitted repairs can be divided into four categories: community drainfield, onsite sewage system, only the sand filter and/or mound, or only tank placement.

Finding: 161 repairs were permitted from 2013-2022. As shown in Table 8, unspecified repairs or replacement of the OSS were the most common followed by tank placement.

Table 8. Type and Quantity of Permitted Repairs from 2013-2022

Year	Permitted Repair Type			
	Community Drainfield	Onsite Sewage System	Sand Filter and/or Mound Only	Tank Placement Only
2013	0	13	1	3
2014	0	13	1	6
2015	1	12	1	7
2016	0	9	0	10
2017	0	10	1	9
2018	3	8	0	4
2019	0	3	0	2
2020	0	7	1	5
2021	2	11	1	6
2022	0	6	1	4
Total	6	92	7	56

Compliance

Septic systems are considered out of compliance, or nonconforming, when property owners have not had all of the components of their septic system inspected within a year prior to their OPC renewal due date or 120 days after, or not completed necessary maintenance and/or repairs, or not completed the required dye test for high-risk properties. Nonconforming septic systems are considered in violation and are flagged in the county data management system, this is considered passive compliance. Active compliance is utilized for septic systems in failure that pose a public health risk. Active compliance requires the repair or replacement of the septic system, sewer connection, or vacating the property at the property owner's expense. Tools for active compliance include written notices of violation, administrative hearings, civil penalties, and court action. Some permits may not be issued due to the violation and some home lenders will not provide a loan for homes when the septic system is in violation.

Finding: There is a steady flow of septic systems being placed in violation and systems being removed from violation. As shown in Table 9, fewer septic systems were placed in violation during 2020 and 2021 due to allowed delays to accommodate the working conditions for septic professionals and Environmental Health staff during the initial phase of the COVID-19 pandemic. At the end of 2022, approximately 11% of septic systems in the NRWPA did not have a current OPC and were considered in violation. Figure 2 shows the compliance status of every parcel within the program as of October 1, 2022.

Table 9. Number of Septic Systems In and Out of Violation from 2013-2022

Year	Systems Placed in Violation	Systems Removed from Violation	Running Total of Violations at End of Year
2013	111	14	97
2014	168	24	241
2015	185	53	373
2016	137	65	445
2017	130	86	489
2018	154	148	495
2019	134	141	488
2020	59	128	419
2021	79	71	427
2022	191	120	498

Another element of compliance is quality assurance/quality control (QA/QC) site visits and technical assistance. The goal is to field check 10% of completed inspections each year to ensure accurate reporting. Technical assistance is also provided during site visits, but most of the technical assistance is through phone calls.

Finding: As shown in Table 10, the goal of field checking 10% of completed inspections yearly has not been met. An estimated 110 to 165 QA/QC site visits would need to be performed every year to meet the goal.

Table 10. Number of QA/QC Site Visits per Year

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
# Site Visits	69	75	38	33	62	33	53	32	36	49

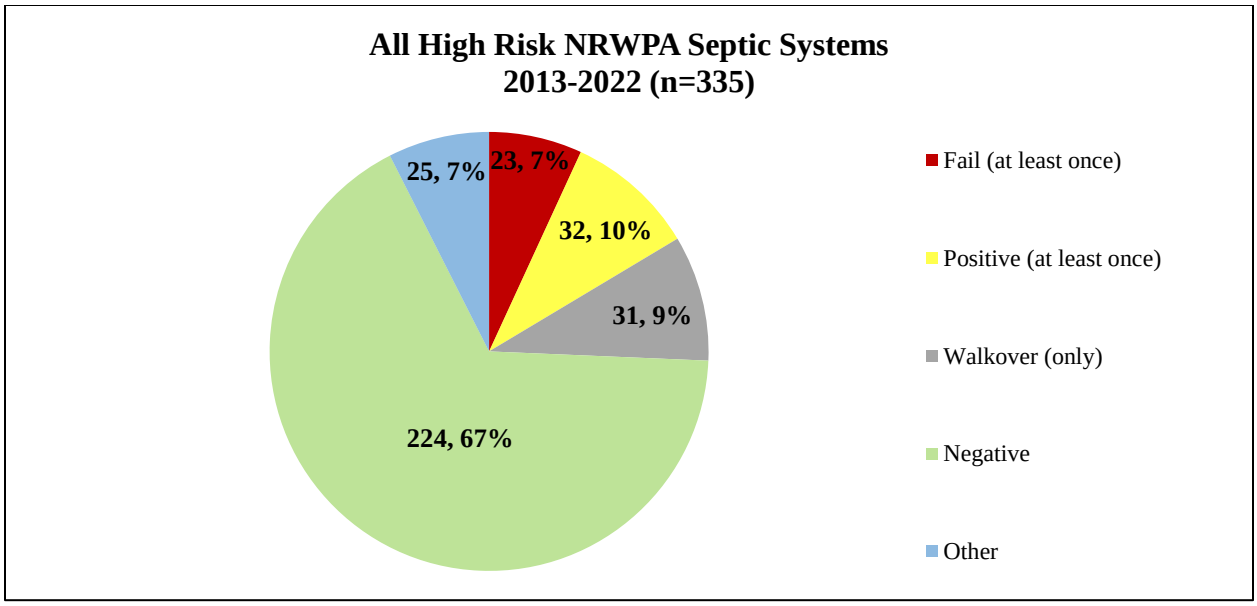
Dye Test Results

Routine dye tests are required of all high-risk properties within the NRWPA boundary as a condition of the operational certificate. The dye test schedule coincides with the operational certificate due date and is required every 6-9 years. Dye tests were required every 6 years initially. The timing requirement transitioned to every 9 years after December 2017, see the Adaptive Management section for more information. The dye test results are divided into walkover, dye negative, dye positive, and failing. An operational certificate cannot be renewed with a dye test result of failing until the septic system has been repaired, either through a minor or permitted repair.

Finding: Routine dye testing finds failing septic systems that may not be readily found through physical inspections. As shown in Figure 5, of the 335 septic systems, as represented by OPCs, that are ranked as high risk:

- 25 (7%) have not had a dye test evaluation for a variety of reasons such as although the septic system has been installed, the house has not yet been built; the house was recently built; the OPC only represents a shared drainfield; the dye test is currently in progress; or the property owner has failed to schedule or refused the dye test. Labeled as other on figure.
- 31 (9%) have only had a walkover due to lack of running or standing water or low areas where water might collect on the property
- 224 (67%) have received dye negative results
- 32 (10%) have received dye positive results at least once
- 23 (7%) have received failing results at least once

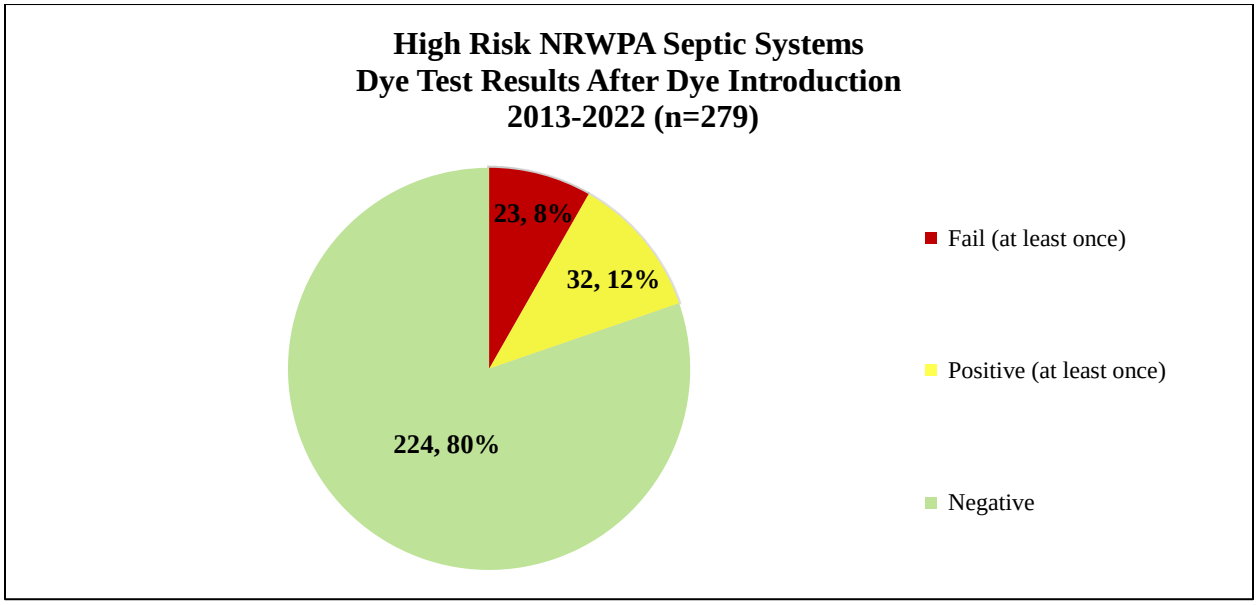
Figure 5. Dye Test Results for All High Risk Septic Systems from 2013-2022



Finding: As shown in Figure 6, of the 279 septic systems, as represented by OPCs, that are ranked as high-risk and had dye introduced during the dye test evaluation:

- 224 (80%) have received only dye negative results
- 32 (12%) have received dye positive results at least once
- 23 (8%) have received failing results at least once

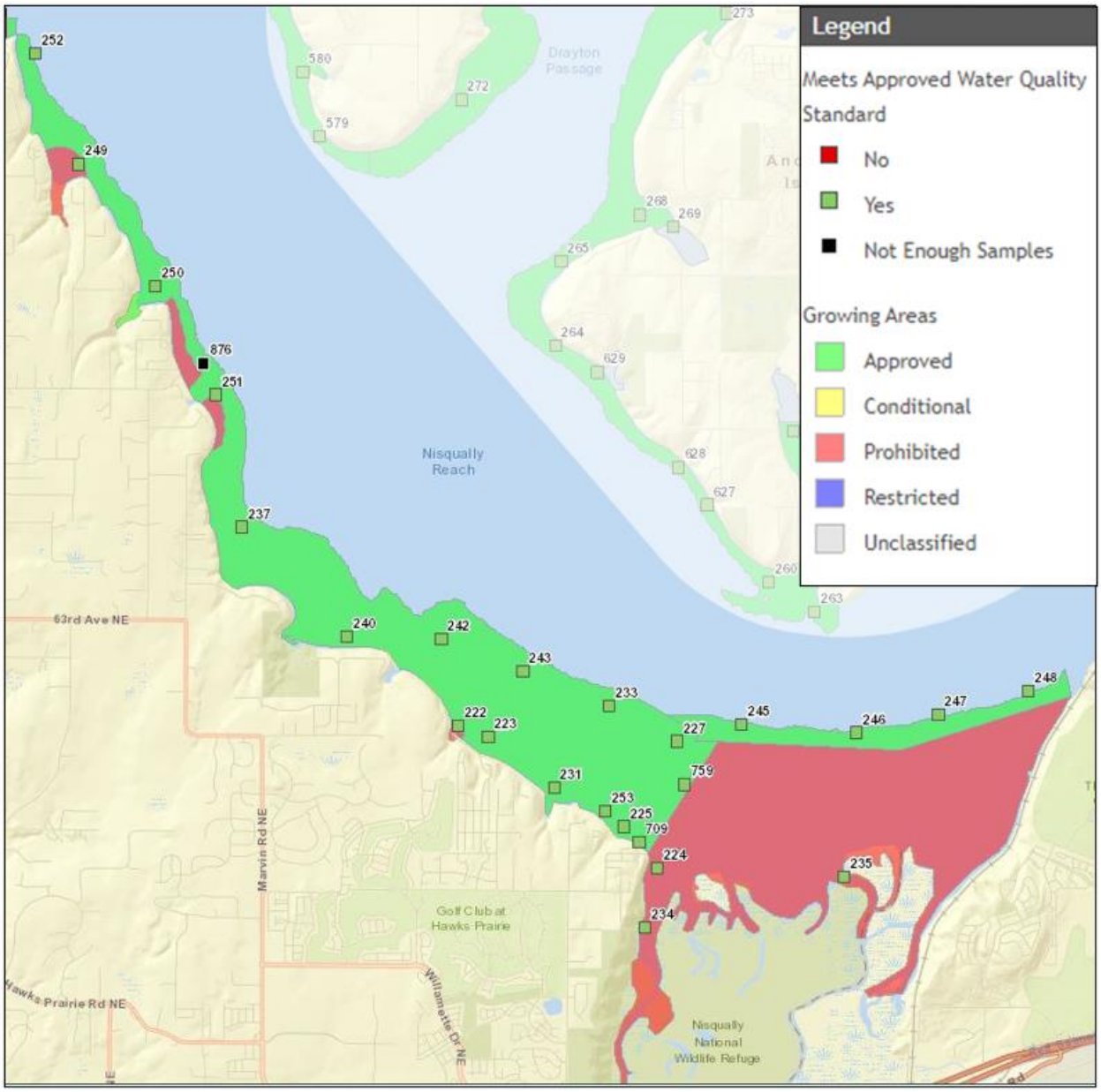
Figure 6. Dye Test Results After Dye Introduction from 2013-2022



WATER QUALITY RESULTS

The Washington State Department of Health (DOH) regularly and frequently samples the marine water quality in the Nisqually Reach. The DOH marine sample fecal coliform results were used to evaluate if the program addressed water quality degradation from onsite sewage systems as intended. See Figure 7 for marine sampling station locations and commercial shellfish growing area classifications.

Figure 7. Map of Nisqually Reach Commercial Shellfish Growing Areas and Marine Sampling Stations



Map from the Washington State Department of Health Commercial Shellfish Map Viewer, https://fortress.wa.gov/doh/oswpviewer/index.html, created on 4-26-2023.

Finding: As shown in Table 11, water quality in the Nisqually Reach has improved since this program went into effect. Water quality, as measured by fecal coliform, at nearly every station improved, including water quality in commercial shellfish growing areas classified as "Prohibited". At Marine Station 223, the only station that did not see improvement from 2012 to 2022, the Geometric Mean stayed the same and the estimated 90th Percentile slightly increased. The sample results for Marine Station 223 are still well within the standards for the National Shellfish Sanitation Program (NSSP). Although the sample results for Marine Stations 224, 234, 235, and 249 are also within the standards for the NSSP, the surrounding areas remain classified as "Prohibited". Marine Sampling

Stations 224, 234, and 235 are within the Nisqually National Wildlife Refuge and Marine Sampling Station 249 is located in close proximity to a marina.

Table 11. Fecal Coliform in Nisqually Reach Measured at DOH Marine Stations

	2012		2022		Improvement in Water Quality	2022 NSSP Standard Met
Station Number	Geo Mean	Est. 90th Percentile	Geo Mean	Est. 90th Percentile		
222	3	9	2.6	8	✓	✓
223	2.6	7	2.6	7.1	-	✓
225	5	23	2.7	5.9	✓	✓
227	2.4	5	1.9	2.7	✓	✓
231	3	8	2.7	5.7	✓	✓
233	2.2	5	1.8	2.3	✓	✓
237	2	3	1.9	2.8	✓	✓
240	2.3	7	1.7	1.8	✓	✓
242	1.9	3	1.8	2.7	✓	✓
243	2.1	4	1.9	3	✓	✓
245	2.5	7	1.9	3.1	✓	✓
246	3.6	14	2.5	6.4	✓	✓
247	2.8	7	2.3	4.9	✓	✓
248	3.1	8	2.1	3.7	✓	✓
250	2.3	9	1.8	2.6	✓	✓
251	1.9	3	1.8	2.3	✓	✓
252	2.2	5	1.8	2.7	✓	✓
253	3.2	11	2.6	6	✓	✓
709	7	43	3.6	10.4	✓	✓
759	3.3	12	2.2	4.1	✓	✓
224	6.3	31	3.4	9.5	✓	✓
234	6.7	28	4.2	15	✓	✓
235	14.3	61	10.8	41.8	✓	✓
249	2.2	4	1.9	3	✓	✓

According to the Washington State Department of Health Office of Shellfish and Water Protection Annual Growing Area Review for the year ending 2012, the classification status for commercial shellfish growing areas within the Nisqually Reach was “Meets standards, but threatened with downgrade in classification”. The classification status for the year ending 2022 was “Well within the classification standards”.

Finding: From 2012 to the present there have been no downgrades in classification in the Nisqually Reach. Because of water quality improvements, the acres of approved commercial shellfish growing areas have increased, 127.3 acres were upgraded to approved.

ADAPTIVE MANAGEMENT

After program implementation, several changes were made to adapt to new information and situations. Routine dye test frequency for high-risk properties was adjusted from six to nine years. This transition began December 1, 2017 (Ordinance No. H-3-2017) and was based on comparing marine recovery area dye test results with previous dye test results in the area. To reduce barriers to compliance for our property owners:

- the fee and mandatory field inspection for returning to compliance were removed
- electronic submittal of inspections for certified self-inspectors was made available
- inspection due dates were automatically extended in 2020 due to the COVID-19 pandemic

EQUITY AND FAIRNESS

The program has tried to be equitable and fair by utilizing the following practices:

- Homeowners may request a review if they believe that their property is not in the Nisqually Reach Watershed Protection Area, or that the fees or requirements have been applied to their property in error.
- Homeowners receive advance notice of their inspection due date by mail and may request a 30 day, 3 month, or 6 month extension if needed.
- Greater program rates are charged on high-risk properties to cover the cost of performing dye test evaluations.
- Environmental Health staff ensures that financial assistance and self-inspector workshops are available to reduce the financial burden to homeowners.
- Financial assistance and the riser rebate program are funded by other sources.
- Certified self-inspector workshop schedules are flexible, with weekend workshops available. Certified self-inspectors may submit inspection reports online, through the mail or office drop box, and in-person during business hours.
- The Thurston County Environmental Health website has septic system care information, program information, and lists of septic professionals certified to work in Thurston County. According to the United States Census Bureau (www.census.gov), 95.6% of Thurston County households have a computer and 91.6% of Thurston County households have a broadband Internet subscription. For those without computer or internet access, access is available during business hours in the ADA accessible office. Additionally, educational brochures and paper versions of the lists of septic professionals are available.
- Thurston County Environmental Health has interpreter services available. According to the United States Census Bureau, 11.9% of persons age 5 years+ live in a home where a language other than English is spoken.
- Environmental Health staff is available to answer questions, provide education, and conduct quality assurance site visits. Staff is available in-person at the office, by phone, and by email. Additionally, homeowners may make appointments with staff to visit their property, at no additional cost, to provide education and/or quality assurance.

CONCLUSION

The Nisqually Reach Watershed Protection Area Onsite Sewage System Operation & Maintenance Program has been and continues to be successful in achieving the goals of protecting public health and improving water quality within Nisqually Reach by addressing water quality degradation resulting from onsite sewage systems. The program results show that septic system issues and failures are being found and repaired due to regular inspections, maintenance, and dye tests. The program is considered successful because:

- The water quality standard continues to be met in approved commercial shellfish growing areas, and the water quality improved at almost all marine sampling locations;
- The water quality improved in commercial shellfish growing areas classified as unapproved or "prohibited", and met the water quality standard at all marine sampling locations;
- The number of acres approved for commercial shellfish harvesting increased;
- Tthe number of septic systems with recent inspections and maintenance has increased.

Water quality in the Nisqually Reach has improved despite steady increases in the population and development in the watershed. There has been a 35% increase in population within the Nisqually Reach Watershed Protection Area as estimated by 2010 and 2020 census data and an 11% increase in the number of septic systems as calculated from county monitoring data. The water quality improvements can be partially attributed to the diligent property owners within the NRWPA. Property owners have actively participated in the Onsite Sewage System Operation & Maintenance Program through completing or hiring septic professionals to complete routine inspections, regular maintenance, and repairs when needed. As stated on the Results Washington website (https://results.wa.gov/measuring-progress/archived-outcome-measures/goal-3-sustainable-energy-clean-environment-goal-map), state level goals for a clean environment included "Increase percentage of inspections that are current for onsite sewage systems in marine recovery areas and other specially designated areas from 37% to 60% by 2020." In the Nisqually Reach Marine Recovery Area (aka Nisqually Reach Watershed Protection Area), 89% of onsite sewage systems have current inspections. The Time of Transfer program may be contributing to the high compliance rate. Additionally, water quality improvements can also be attributed to reductions in pollution due to changes in land use, stormwater, and animal waste practices. Many people and programs have led to improved water quality throughout the watershed.

Maintaining the water quality of the Nisqually Reach protects public health and requires continued diligence, long-term commitment, and public involvement. Continuation of the Nisqually Reach Watershed Protection Area Onsite Sewage System Operation & Maintenance Program and the marine recovery area designation will ensure that water quality degradation from onsite sewage systems will continue to be addressed and/or prevented, improvements in marine water quality are maintained, and standards are met for commercial shellfish harvesting.

LESSONS LEARNED: WHAT WORKED WELL

Many aspects of the program worked well, such as:

- Rates and charges collected with property taxes
- Online reporting by septic professionals and certified self-inspectors has improved efficiency
- Automating processes has improved efficiency
- Homeowner self-inspector training workshops
- Cooperation from Nisqually Reach Watershed Protection Area septic system owners
- Incentives and financial assistance have helped residents learn about their systems, take responsibility for maintenance, and made compliance with the required inspections easier and/or more economically feasible
- Passive compliance for nonconforming systems

LESSONS LEARNED: WHAT IS NEEDED

Some aspects of the program need improvement, such as:

- Continuing education for septic professionals
- Continuing education for certified self-inspectors
- Increase number of QA/QC visits
- Alignment of Consumer Price Index date, used for rates and charges, with other programs

APPENDIX A: ACRONYMS

MRA – Marine Recovery Area; an area of definite boundaries where the health officer or Board of Health has determined that additional requirements for existing onsite sewage disposal systems may be necessary to reduce potential failing systems or minimize negative impacts of onsite sewage disposal systems.

NMRA or NRMRA – Nisqually Marine Recovery Area aka Nisqually Reach Marine Recovery Area; the portion of the Nisqually Reach Shellfish Protection District most likely to impact marine water quality; the same geographic area as the Nisqually Reach Watershed Protection Area; refer to Figure 1.

NSPD or NRSPD – Nisqually Shellfish Protection District aka Nisqually Reach Shellfish Protection District; refer to Figure 1.

NWPA or NRWPA – Nisqually Watershed Protection Area aka Nisqually Reach Watershed Protection Area; the portion of the Nisqually Reach Shellfish Protection District most likely to impact marine water quality; the same geographic area as the Nisqually Reach Marine Recovery Area; refer to Figure 1.

OPC – operational certificate

OSS – onsite sewage system aka onsite sewage disposal system aka septic system.

O & M – operations and maintenance.

APPENDIX B: RELATED COUNTY ORDINANCES

Ordinance No. H-1-2012, an ordinance amending Article IV, sections 3, 14.3.2.1.1, 16.4.9, 16.5.5, 21.4.5.2, 22, 27.1, and Appendix A of the Sanitary Code for Thurston County.

Ordinance No. H-3-2017, an ordinance amending Article IV of the Sanitary Code for Thurston County.

Ordinance No.12680, an ordinance creating the Nisqually Reach Shellfish Protection District, establishing its boundaries, and adopting a shellfish protection program.

Ordinance No.13066, an ordinance amending the Nisqually Reach Shellfish Protection District shellfish protection program set forth in Ordinance No.12680.

Ordinance No.14713, an ordinance amending the Nisqually Reach Shellfish Protection District boundaries, amending the Henderson Inlet Shellfish Protection District and Nisqually Reach Shellfish Protection District Consolidated Work Program, and fixing rates and charges to fund an onsite sewage system operation and maintenance program in the Nisqually Reach Shellfish Protection District.

Ordinance No.15514, an ordinance amending the Henderson Inlet Shellfish Protection District and Nisqually Reach Shellfish Protection District Consolidated Work Program and fixing rates and charges in the Henderson Inlet Shellfish Protection District for an additional ten years.

Ordinance No.15790, an ordinance amending the Henderson Inlet Shellfish Protection District and Nisqually Reach Shellfish Protection District Consolidated Work Program.

APPENDIX C: RELATED DOCUMENTS

Environmental Health Division. (2012). *Nisqually septic system operation & maintenance project final report*. Thurston County Public Health and Social Services.

Environmental Health Division. (2013). *Henderson watershed protection area onsite sewage system operation & maintenance program, five-year review*. Thurston County Public Health and Social Services.

Nisqually Reach Shellfish Protection District Stakeholder Group. (2003). *Report & recommendations*. Thurston County. https://www.co.thurston.wa.us/planning/natural-res/docs/shellfish-nisqually-reach-stakeholder-committee-report-2003.pdf

Office of Environmental Health and Safety. (2018). *2018 Shoreline survey of the Nisqually Reach shellfish growing area*. Washington State Department of Health.