

Preliminary Significant Analysis

Chapter 246-272B WAC Large On-site Sewage Systems

December 2010

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Section 1: Introduction

Overview

A large on-site sewage system (LOSS) is a specific type of decentralized wastewater system that collects, treats, and disposes of sewage from individual homes or buildings at or near its point of generation.¹ A LOSS is an appropriate sewage treatment and disposal option for a wide range of residences or buildings in a variety of settings. A LOSS is defined by statute as an on-site sewage system with design flows of between 3,500 gallons per day (gpd) and 100,000 gpd. In terms of housing developments, this design flow range means that a LOSS can serve from about 10 homes to about 370 homes.

Examples of homes and buildings served by large on-site sewage systems include:

- Small strip malls;
- Grocery stores;
- Restaurants;
- Schools;
- Churches;
- Housing developments including single-family homes, apartments, condominiums, or manufactured housing;
- Rest stops;
- Campgrounds and Recreation Vehicle parks;
- Resorts or state park sites with laundry, kitchen facilities or a restaurant; and
- Smaller cities or towns, such as Almira and Packwood.

Chapter 70.118B RCW, Large on-site sewage disposal systems, establishes the Department of Health (the department) as the single state agency responsible for the comprehensive regulation of LOSS. The LOSS statute requires regulation of the siting, design, construction, installation, operation, maintenance, and repair of LOSS for the protection of public health and the environment. Prior to enactment of the LOSS statute in 2007, the department's authority to regulate LOSS was limited to LOSS with design flows between 3,500 gpd and 14,500 gpd (referred to in this document as "low volume LOSS"). The legislation expanded the department's authority to include LOSS with design flows between 14,500 gpd and 100,000 gpd (referred to as "high volume LOSS") and added environmental protection responsibilities to the department's public health protection responsibilities. High volume LOSS were previously regulated by the Department of Ecology (Ecology).

¹ Valuing Decentralized Wastewater Technologies, Rocky Mountain Institute, November 2004 p.2-3

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Properly designed and maintained on-site sewage systems (OSS) protect public health and the environment by preventing public exposure to raw sewage and groundwater contamination or surface water infiltration. LOSS collect, treat, and dispose of domestic sewage² using multiple barriers designed to interrupt or disrupt disease transmission. These multiple barriers remove pathogens from sewage and provide important public health and environmental protection measures.

Currently, there are over 350 low volume LOSS with operating permits issued by the department. The department anticipates that it will ultimately regulate approximately 25 additional high volume systems, which Ecology currently regulates. In July 2009, in accordance with RCW 70.118B.030(10), the department began processing applications for license renewals and began issuing permits for high volume LOSS whose Ecology issued licenses had expired.

In addition, there are approximately 65 low volume systems that have been regulated by the local health jurisdictions under memorandum of understandings (MOUs) with the department. These systems are also transferring to the department for regulation as the MOUs and permits expire.

LOSS Rule Revision Background

In January 2008, the department filed a Pre-proposal Statement of Inquiry (CR-101) and formed the LOSS rule advisory committee. Members of the rule advisory committee represented a wide range of interests such as, on-site sewage system engineers, installers, and operation and maintenance providers; construction contractors; the shellfish industry; environmental groups; LOSS owners, including manufactured housing owners and state agency staff who manage parks and rest stops; water-sewer districts; private utility companies; and local health jurisdictions. The committee and several subcommittees met at least monthly throughout 2008 and early 2009 and then on an as-needed-basis.

The department completed a draft LOSS rule in early 2010 and held public workshops in April 2010. The department reviewed the comments received with the rule advisory committee in May 2010 and incorporated suggested changes into the proposed rule as appropriate.

Section 2: What is the scope of the rule?

Overview

This proposed rule establishes a comprehensive framework for LOSS regulation and consolidates requirements for low volume LOSS and high volume LOSS into one rule. It establishes requirements based on new statutory directives and updates the department's existing LOSS requirements and standards that apply to new construction, permitting, facility modifications, repairs, replacements, expansions, and failures. The new and updated

² RCW 70.118B.010(4)

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requirements protect public health and the environment by preventing human contact with untreated sewage or surface or groundwater contamination from untreated sewage.

For a low volume LOSS, the proposed rule includes new requirements to protect the environment and amends existing requirements and standards. For high volume LOSS, the proposed rule incorporates requirements that are substantially similar to existing Ecology rules. Prior to the 2007 LOSS legislation, Ecology regulated LOSS as domestic wastewater facilities using subsurface disposal, but restricted use of these systems under WAC 173-240-035, to circumstances where no other reasonable alternative existed. The 2007 LOSS legislation removed this barrier, making LOSS an appropriate sewage disposal option when supported by the acceptable site, soil, and treatment levels.

The proposed rule includes requirements that unify what were design and approval requirements for domestic wastewater facilities (high volume LOSS) with design review and approval requirements for low volume LOSS. The combined design and approval requirements replace Ecology's rules for domestic wastewater facilities in Chapter 173-240 WAC. The proposed rule incorporates key concepts from Chapter 173-200 WAC and Chapter 173-201A WAC relating to "all known, available, and reasonable methods of treatment" (AKART)³ and water quality groundwater standards.

The proposed rule also establishes permitting requirements for the high volume LOSS that will transition from a state waste discharge permit issued by Ecology to a LOSS operating permit issued by the department. For these high volume LOSS, the requirements of the proposed rule replace the requirements of Chapter 173-216 WAC.

Focus of the Proposed Rule

New Requirements

The proposed rule incorporates several new requirements, consistent with the LOSS statute, including:

Environmental review requirements for all systems: The environmental review requirements in the proposed rule apply to all new LOSS and apply to all existing LOSS on a case-by-case basis. Environmental review documentation requirements include a site risk survey and a hydrogeology report, as applicable. The proposed rule also requires a monitoring and reporting plan for new LOSS. These rule requirements provide design engineers, soils specialists, hydrogeologists, and the department with an approach consistent with water quality standards and AKART requirements.

³ RCW 70.118B.040(2)(b) uses the phrase "all known, available, and reasonable methods of treatment."

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Public notice requirements for high volume systems: The 2007 legislation requires that the department adopt rules that ensure adequate public notice and an opportunity for review and comment on LOSS with a design flow of greater than 14,500 gpd with respect to:⁴

- Initial operating permit applications;
- Applications to expand existing LOSS to increase the volume waste; and
- Applications to change effluent characteristics.

The proposed rule establishes the public notice requirements LOSS owners must follow and establishes the criteria for the public's opportunity to review and comment.

Third Party Appeal Opportunity for high volume systems. The proposed rule establishes the right to an adjudicative proceeding for a person aggrieved by the issuance of an initial permit, or by the issuance of a subsequent permit to increase the volume of waste disposal or to change effluent characteristics, for systems with design flows of more than 14,500 gpd.

Requirement to Obtain a Permit for all Systems: The 2007 legislation specifies that all LOSS owners must obtain a permit. Previously, older LOSS were exempt from the department's permit requirement. The proposed rule provides LOSS owners and permitting agencies with a tailored permitting process that takes into account the age and capacity of the LOSS and any previous permits.

Changes to Existing LOSS Requirements

The proposed rule updates the department's design and site review and approval requirements, design and construction standards, and operation and maintenance requirements:

Design and site review and approval: The proposed rule updates the design document requirements, such as the pre-design document, engineering plans and specifications, management plan, and operation and maintenance manual.

Design and construction standards: The proposed rule contains requirements derived from research and guidance documents. Some of the topics that moved from guidance documents to rule include: nitrate balance, pressure distribution, and public domain and proprietary treatment technologies. The proposed rule also updates horizontal and vertical separation requirements for systems between 3,500 and 14,500 gpd and sets the requirements for systems 14,500 gpd to 100,000 gpd.

Operation and maintenance requirements: The proposed rule updates routine operation requirements which include LOSS management requirements, operation and maintenance requirements, department inspections, operator qualifications, emergency response, and sewage tank management requirements. In addition, the proposed rule also revises requirements for modifications, failures, and abandonment.

⁴ RCW 70.118B.030(8) and (9).

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Portions of the Rule Requiring Significant Analysis

The department determined the LOSS rule is a significant legislative rule and subject to the requirements of RCW 34.05.328(5). The department evaluated the proposed LOSS rule sections to determine whether the changes in each section are “significant” or “non-significant.” Based on the evaluation, the department determined several proposed rule sections are non-significant under WAC 34.05.328 (5)(c) and therefore, and do not require a significant analysis. These proposed rule sections and the department’s rationale are listed in the table below. The department determined the remaining proposed rule sections are significant, and are analyzed in Section 5.

| Sections Determined Non-Significant | Rationale |
|---|---|
| Part 1: General provisions | |
| <ul style="list-style-type: none"> • 01000 Purpose and objectives • 01100 Applicability and relationship to other statutes and regulations • 01200 General requirements • 01300 Acronyms and definitions | <p>These sections provide the department’s interpretation of underlying statutes, update language to incorporate specific statutory changes, and clarify existing requirements.</p> <p><i>Definitions are analyzed in context as part of the section-by-section analysis.</i></p> |
| Part 2: Approval and permitting process Subpart A – New Construction | |
| <ul style="list-style-type: none"> • 02000 Site review – Predesign report, soil characterization, and site inspection • 02050 Environmental review – Site risk survey and hydrogeology report • 02100 Engineering • 02150 LOSS 14,500gpd and below – Operating permit application and approval to construct • 02200 LOSS greater than 14,500gpd – Operating permit application • 02300 LOSS greater than 14,500gpd – Operating permit and approval to construct • 02350 Construction | <p>These sections incorporate specific statutory requirements, update department procedures, and incorporate substantially similar Ecology procedures.</p> <p><i>Changes to required documentation in these sections are analyzed within the sections specifically detailing the required elements of each type of documentation.</i></p> |

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| Sections Determined Non-Significant | Rationale |
|--|--|
| Part 2: Approval and permitting process Subpart B – First Department Operating Permit for Existing LOSS | |
| <ul style="list-style-type: none"> • 02400 - LOSS constructed on or before July 1, 1984 • 02450 - LOSS with current permit from department of ecology or local health jurisdiction • 02500 - LOSS constructed after July 1, 1984, without current operating or discharge permit | <p>These sections incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 2: Approval and permitting process Subpart C – Permitted LOSS | |
| <ul style="list-style-type: none"> • 02650 Operating permit renewals • 02700 Operating permit requirements and conditions | <p>These sections update language to incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 3: Site and Environmental Review Requirements Subpart A – Site Review | |
| <ul style="list-style-type: none"> • 03000 Site review – Predesign report • 03100 Site review – Inspection | <p>These sections update language to incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 3: Site and Environmental Review Requirements Subpart C – Site Standards | |
| <ul style="list-style-type: none"> • 03400 Soil characterization • 03500 Minimum land area | <p>These sections update language to incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |

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| Sections Determined Non-Significant | Rationale |
|---|---|
| | |
| Part 4: Engineering Requirements | |
| <ul style="list-style-type: none"> • 04000 Engineering report • 04100 Management plan • 04200 Operations and maintenance manual • 04300 Monitoring and reporting plan • 04400 Plans and specifications | <p>These sections incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 5: Construction Requirements | |
| <ul style="list-style-type: none"> • 05300 Department final inspection • 05400 Post-construction documentation | <p>These sections incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 6: Design and Technical Standards Subpart A – General Requirements | |
| <ul style="list-style-type: none"> • 06000 General design requirements • 06050 Horizontal setbacks • 06100 Vertical separation • 06150 Design flows • 06200 Sewage characterization • 06400 Design requirements to allow monitoring and maintenance • 06500 Collection, conveyance, and other piping appurtenances | <p>These sections incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 6: Design and Technical Standards Subpart B – Specific Technologies | |
| <ul style="list-style-type: none"> • 06600 Pressure distribution • 06650 Subsurface drip systems • 06700 Sand-lined trenches and beds • 06750 Intermittent sand filters • 06800 Re-circulating gravel filters • 06850 Cesspools and seepage pits • 06900 Hold tank sewage systems | <p>These sections incorporate specific statutory requirements and rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |

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| Sections Determined Non-Significant | Rationale |
|--|---|
| | |
| Part 7: LOSS Operations Requirements Subpart A – Routine Operations | |
| <ul style="list-style-type: none"> • 07000 Management requirements • 07100 Department inspections • 07150 Reliability and emergency response • 07250 Metering • 07300 Sewage tank management | <p>These sections incorporate rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 7: LOSS Operations Requirements Subpart B – LOSS Changes | |
| <ul style="list-style-type: none"> • 07400 Repair and replacement • 07550 Connection to a sanitary sewer system | <p>These sections incorporate rule requirements consistent with or substantially similar to existing department and Ecology requirements.</p> |
| Part 8: Waivers, Enforcement, and Appeals | |
| <ul style="list-style-type: none"> • 08000 Waivers • 08100 Enforcement • 08200 LOSS Owner – Notice of decision, appeals, and adjudicative proceedings • 08300 Appeals to department permit decisions for LOSS over 14,500 gpd and adjudicative proceedings | <p>These sections incorporate specific statutory requirements.</p> |
| Part 9: Severability | |
| <ul style="list-style-type: none"> • 09000 Severability | <p>This section updates department procedures.</p> |

Section 3: What are the general goals and specific objectives of the proposed rule's authorizing statute?

RCW 34.05.328(1)(a) requires that agencies clearly state in detail the general goals and specific objectives of the statute that the rule implements.

The goal of chapter 70.118B RCW is to protect public health and the environment through comprehensive regulation of large on-site sewage systems. Under RCW 70.118B.005(3),

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The primary purpose of this chapter is to establish, in a single state agency, comprehensive regulation of the design, operation, and maintenance of large on-site sewage systems, and their operators, that provides both public health and environmental protection. To accomplish these purposes, this chapter provides for:

- (a) The permitting and continuing oversight of large on-site sewage systems;*
- (b) The establishment by the department of standards and rules for the siting, design, construction, installation, operation, maintenance, and repair of large on-site sewage systems;*
- (c) The enforcement by the department of standards and rules under this chapter.*

RCW 70.118B.020 further provides

For the protection of human health and the environment the department shall:

- (a) Establish and provide for the comprehensive regulation of large on-site sewage systems including, but not limited to, system siting, design, construction, installation, operation, maintenance and repair;*
- (b) Control and prevent pollution of streams, lakes, rivers, ponds, inland waters, salt waters, water courses, and other surface and underground waters of the state of Washington, except to the extent authorized by permits issued under this chapter;*
- (c) Issue annual operating permits for large on-site sewage systems based on the system's ability to function properly in compliance with the applicable comprehensive regulatory requirements; and*
- (d) Enforce the large on-site sewage system requirements.*

The main objectives of the statute are reducing and preventing human exposure to untreated sewage and preventing untreated sewage from contaminating ground and surface water. Comprehensive regulation of large on-site systems can help meet these goals and objectives.

Section 4: Is a rule required to achieve the goals and objectives? What are the consequences of not adopting the rule?

RCW 34.05.328(1)(b) requires that agencies determine that the rule is needed to achieve the general goals and specific objectives stated under (a) and analyze alternatives to rulemaking and the consequences of not adopting the rule.

The proposed rule meets the general goals and specific objectives of chapter 70.118B RCW by updating existing and establishing new LOSS requirements and standards. The proposed rule establishes requirements for all aspects of LOSS including its design and construction, ownership, management, permitting, operation, maintenance, repair, compliance, and enforcement.

The department assessed the proposed rule and authorizing statute and determined a rule is needed to achieve the goals and objectives because the authorizing statute specifically requires

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that the department adopt a comprehensive LOSS regulation. There are no feasible alternatives to rulemaking since adopting rule amendments is the only option available to implement the statute.

Section 5: What is the total probable benefit and total probable cost of the rule?

RCW 34.05.328(1)(d) requires agencies to determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented.

This section includes an analysis of the broad societal benefits of the rule as a whole as well as a section-by-section analysis of the benefits and costs of each individual rule section deemed significant under RCW 34.05.328(5).

Societal Benefits Analysis

Use of LOSS can provide broad societal benefits related to:

- Decentralized sewage systems, and
- Reduced risk of waterborne disease or sewage contamination events.

Benefits of decentralized sewage systems

When communities examine sewage disposal options, they consider many factors including future demand, permitting and construction time, as well as cost. Communities are often challenged to meet capacity demand without overbuilding or overburdening existing public sewer systems. The available choices are large centralized systems, smaller decentralized systems, or a combination of both. Although centralized systems offer some advantages, including savings related to economies of scale, some of these benefits are offset by costs associated with:

- Idle capacity;
- Proximity or “distance to plant” where centralized systems become less efficient as service area increases due to costly main extensions, reduced population density, need for pumping stations to address gravity, etc.
- Time to obtain more complex approvals and to complete construction; and
- Environmental protection requirements such as limiting discharge of treated sewage to surface water.

The following analyzes the benefits that can be gained by using decentralized systems, such as a LOSS, and is based on EPA’s *Valuing Decentralized Wastewater Technologies, November 2004*. The authors point out that decentralized systems fill an important niche in community

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wastewater treatment facility planning and can provide multiple qualitative benefits to those communities.

Communities can use LOSS to plan sewage management options that more closely match actual growth. One of the factors to consider when planning sewage management is associated with idle capacity. A consequence of using a centralized sewage system to accommodate growth is that a portion of system capacity is idle or unused for sometimes long periods of time while demand grows to match capacity. The opportunity cost of constructing idle sewage treatment capacity means the community resources used to build that capacity cannot be spent on other public service projects such as roads, schools, or other utilities.

When future demand is more difficult to forecast, smaller decentralized systems can be more effective. Smaller units can be built more quickly, at a lower cost, and can be constructed to add capacity incrementally to satisfy changes in demand. In this way, smaller systems do not create excess idle capacity. According to the EPA report, the smaller, faster-to-build modules of capacity save the costs associated with the need to increase lead time of slower-to-build central resources, and the cost of idle capacity that exceeds current need for sometimes significant periods of time. Smaller systems can also be used in areas where the centralized system cannot expand, for example, when an existing centralized system cannot discharge additional waste due to environmental limitations.

To illustrate the practical application of decentralized systems, four communities near Olympia, Washington chose to build several small treatment systems ranging from 0.5 to 3.0 million gallons per day in phases, instead of building a much larger treatment plant initially and a single expansion to that plant later. Although the size ranges in the example exceed a LOSS, the benefit of more closely matching capacity with need for additional treatment still applies.

LOSS may allow owners to develop property where small on-site systems or public sewer isn't available or cost effective. Where allowed, advanced decentralized systems offer an option that could result in the development of land that could not be adequately served by conventional septic systems (due to environmental concerns, for instance) or cost-effectiveness of providing sewers. In Washington, LOSS are allowed in both rural areas and urban growth areas, provided the LOSS is not used to justify changing the zoning population density of the service area. In an urban setting, for example, a high volume LOSS may be used to replace failing individual septic systems when a sewer system is not available. Furthermore, a low volume LOSS may be particularly useful in rural areas for sites that are not suitable for conventional on-site sewage systems (e.g., soil limitations for drainfield areas) since LOSS designs easily incorporate advanced treatment options.

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Repair and replacement of LOSS components is generally less disruptive to property owners and neighborhoods than sewer repair and replacement. In new developments, wastewater installation is often unnoticed as part of the overall construction because there are no residents or businesses occupying the buildings affected by the activities. When repairs or replacement activities occur in already developed properties, the impact to property owners and neighborhoods becomes a concern including:

- Noise and odors from heavy machinery and excavation piles;
- Traffic delays and street closures;
- Business losses due to traffic disruption;
- Damage to vehicles from dirt, potholes, and accidents;
- Permanent or temporary utility re-routing; and
- Replacement costs for vegetation, trees, sidewalks, driveways, walls, fences, and street paving.

Typically public access to LOSS sites is limited or prohibited. This is especially true for the drainfield area. As such, the impacts of repairing or replacing LOSS components are fewer than for public sewers and last for a shorter period of time.

Benefits of reducing the risk of waterborne diseases and contaminating groundwater and surface water from untreated sewage

The proposed rule adds several redundant protection measures including ensuring LOSS are properly sited, well designed, structurally sound, and correctly operated. These protections are designed to reduce sewage contamination or pollution events in communities and related disease outbreaks. LOSS remove pathogens from sewage, providing important safety measures to protect near-by drinking water supplies, shellfish growing areas, and water recreation and tourism areas. Untreated sewage carries bacteria and viruses that cause several diseases including cholera, typhoid, and viral gastroenteritis. These diseases are transmitted by direct contact: Either person-to-person or through ingesting contaminated water or food. If a LOSS and its components are not sited, designed, constructed, and maintained properly, they can cause contamination, pollution, and disease outbreaks.

Potential Avoided Costs: When a waterborne disease outbreak occurs or ground or surface water is contaminated, a variety of personal and community costs are incurred. This can include costs related to:

- Medical activities – health care for outbreak patients and their families, laboratory costs, and epidemiologic studies. The effects of some illnesses can be chronic and require life-long health care. For example, illness caused by organisms like *E. coli* 0157:H7 can require life-long kidney dialysis treatment.
- Losses in productivity – sick leave for employees, employees without work, and reduced or no business revenue.
- Reduced property values.
- Providing bottled water, connecting to other water supplies, and finding and developing a new water supply, if one is available (Kimsey, 2004).

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- Individual owner activities – evaluation of systems, system repair, potential reduction in investment value (OSS is part of the investment in a home or other structure).
- Repair or replacement of community wastewater and/or drinking water system components.
- Rehabilitation of water bodies.
- Local economy effects - losses due to reductions in shellfish harvesting and providing credits for recalling products, losses to tourism-based businesses and other tax revenues.
- Lawsuits and legal fees.
- Death. In extreme cases, particularly for immune compromised individuals, death is a possible outcome of enteric disease. (The federal government typically uses a figure of \$6 million per death when determining the cost of fatal incidents.)

The following examples illustrate the potential costs of waterborne disease outbreaks or shellfish harvest bed contamination related to incompletely-treated sewage from failing on-site sewage systems.

Samish Bay, Washington: In November 2003, Samish Bay, Washington experienced a Norovirus outbreak attributed to failing on-site sewage systems (Dewey, 2004). Norovirus causes stomach flu-like symptoms with gastrointestinal upset (gastroenteritis). This event illustrates the variety and complexity of societal costs that can result from a waterborne illness outbreak.

Since Norovirus is not a reportable condition, it is difficult to determine how many people fell ill during this outbreak. However, it was significant enough to come to the attention of the local health authorities and spark an investigation.

Ill people and their families were impacted by health care costs and lost income for those on unpaid sick leave, as well as the worry about recovery, continued spread of disease, and identification and correction of the source of the problem.

In addition to the human illness costs associated with the outbreak, the economic impacts to the shellfish industry, whose harvest area was closed, included:

- An estimated combined loss of \$130,000 in sales for several shellfish companies.
- Product recalls from several states resulted in a cost to the firms and an estimated \$20,000 in credits being issued.
- 11 employees were laid off.

Other businesses also felt the effects. Local restaurants and retail markets had to locate and purchase shellfish product elsewhere, or do without. Fewer local residents wanted to buy or eat shellfish.

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Recreational use of waterways, including recreational shellfish harvesting, is also restricted when a contamination event that impacts surface or marine waters occurs. These areas are closed to recreational activities to prevent direct human exposure. Not only were the people who wanted to do recreational activities in Samish Bay affected, but local businesses that rely on tourist-type revenues also lost income.

Albany, New York: In September 1999, a waterborne disease outbreak at the Washington County Fair near Albany, New York killed two people and hospitalized 71. The New York Department of Health investigation results showed another 781 people were confirmed with or suspected of illness related to the outbreak (*E. Coli and Campylobacter*) and 2,800 to 5,000 people may have developed other gastrointestinal illness⁵ The source was a contaminated well. Fairgoers became ill from drinking either beverages or ice made with the contaminated well water. The investigation identified two suspected sources of contamination – a nearby failing septic system and manure storage piles.

Although reports of the event did not try to quantify costs, most of the “potential avoided costs” listed above were experienced, and the event has had long-lasting effects on the community.

Twanoh State Park, Washington: Twanoh State Park lies on the south shore of Hood Canal and is a 182-acre marine camping park with 3,167 feet of saltwater shoreline. It has tent and RV camping sites with restrooms, sewage hook-ups, and a boat waste dump site. In July 2005, the department implemented an emergency closure for the entire shoreline of the Twanoh State Park and the corresponding shellfish growing area due to high levels of fecal coliform bacteria. This action closed the area to all recreational and commercial shellfish harvesting.⁶

The State Parks Department also closed its restrooms and dump stations served by its on-site sewage facilities and the beach area along the park’s shoreline.

The Twanoh State Park LOSS serves both the campground and day-use areas. Routine testing found elevated fecal coliform bacteria levels in water samples taken in the park and near-by Twanoh Creek. A dye study indicated the LOSS was contaminating Twanoh Creek and the shellfish growing area downstream. To reduce the potential sources of contamination, State Parks replaced the failing LOSS.

The emergency closure of the adjacent shellfish growing areas affected the people of Washington in the following ways:

- Decreased recreational activities. Attendance at Twanoh State Park campground site occupancy dropped by 49% during the peak summer period.⁷
- No recreational shellfish harvesting was allowed; and

⁵ New York State Department of Health news release, March 2000.

⁶ Department of Health, 2005 Hood Canal 7 Shellfish Growing Area Shoreline Survey

⁷ Ibid. p18

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- No commercial shellfish harvesting was allowed.

The types of costs incurred were similar to the Samish Bay event, including lost shellfish harvesting revenue for the Squaxin tribe. However, no waterborne or food-borne illness was reported.

Similk Bay, Washington: Similk Bay is located in north Puget Sound on the south side of Fidalgo Island in Skagit County. After a ten year harvest bed closure, the department recently upgraded 80 acres in Similk Bay to allow commercial and recreational shellfish harvesting.

The department closed the area to harvesting in 2000 due to high bacteria levels caused by failing on-site sewage systems in the Similk Beach community. Development around Similk Bay is rural residential properties with all homes using on-site sewage systems for treatment and disposal of sewage. The Skagit County Public Health Department surveyed 86 homes, identified problems with the systems, including 45 system failures, and worked with residents to repair the systems⁸. Recent water quality samples show success in these efforts, with low bacteria levels.

During the ten year closure, no commercial harvesting was allowed, which resulted in revenue losses for commercial shellfish companies and near-by tribes, such as the Swinomish Indian Tribal Community. The public was also affected since the growing area was closed to recreational harvesting, and businesses that rely on tourist revenues lost income.

Section-by-Section Benefit and Cost Analysis

For each proposed rule section deemed significant, the following section-by-section analysis includes a description of the proposed changes as well as the associated benefits and costs of those changes. To obtain cost estimates for the proposed changes, the department consulted stakeholders and on-site sewage system consultants with LOSS expertise in particular fields, such as design engineers and installers (Appendix A). The department summarized the cost information (Appendix B) in the corresponding sections.

There is considerable diversity among LOSS depending on the system size, site conditions, treatment types employed, design complexity, age and condition of the system, number of customers served, and ownership and management structure. The current cost of constructing a LOSS varies dramatically based on this diversity of circumstance and can range from \$20 to \$40 per gpd of designed flow. The department assumes there is similar variability in cost for the proposed changes to the rule so the cost information is presented as a range.

⁸ Department of Health, Similk Bay Sanitary Survey, July 2010.

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Part 2: Approval and Permitting Process

Section 02250, LOSS greater than 14,500 gpd – Public notice

The 2007 legislative changes included a requirement for public notice and opportunity to comment on draft permit requirements and conditions for certain LOSS when owners propose:

- Obtaining an initial operating permit for a high volume LOSS,
- Changing effluent or sewage characteristics for a high volume LOSS, or
- Changing sewage volume that increases the design flow of a low volume LOSS to above 14,500 gpd.

The requirement applies to all LOSS meeting the three conditions above and is based on Ecology's waste discharge permit public notice requirements in WAC 173-216-090. The significant changes in the proposed rule modify those requirements by:

- Requiring public comment earlier in the permit application process – the proposed rule requires public notice before constructing or modifying the LOSS rather than after;
- Changing the responsible party for preparing the public notice from the state to the LOSS owner; and
- Reducing the publication period from 30 days to 2 weeks. The public comment period on the draft permit is unchanged and remains at 30 days.

All other requirements of the proposed rule are consistent with or existing Ecology requirements and do not require analysis.

Benefits: Individuals affected by the proposed LOSS have the best opportunity to have their concerns heard and influence changes to the LOSS proposal before construction or modifications begin. LOSS owners also receive a benefit from conducting public notice prior to construction or modification by avoiding the risk of incurring additional costs to make changes and “re-construct” part or all of the LOSS as a result of the public comments. The proposed rule removes the uncertainty of the effect of public comments by requiring public notice prior to construction or modification, which can avoid potentially expensive post-construction changes.

The department assumes LOSS owners will benefit from reduced publication costs related to reducing the requirement from 30 days publication to 2 days.

Costs: Even though construction may be delayed as compared to existing Ecology practice to accommodate public notice activities, LOSS owners may actually benefit from changing the timing of the required public notice due to the reduced likelihood of having to “re-construct” or modify the system based on public comments earlier in the construction process.

The department will have guidance and templates available for use. As a result, the department assumes the owner will incur nominal costs to prepare the public notice and submit it to the department for review.

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Section 02550, LOSS modifications

The significant changes in the proposed rule modify requirements related to ownership and management entity changes by requiring:

- The owner to notify the department 30 days prior to a change in ownership or management entity; and
- The new owner to submit an operating permit application and management plan 30 days prior to assuming ownership.

The requirements of this section apply to all LOSS and are based on Ecology's ownership transfer requirements identified in WAC 173-216-120, 173-240-101, and 173-240-030. Under current Ecology rules, the ownership and management entity transfer process is triggered when Ecology receives a written agreement between the current owner and the soon-to-be new owner, or the owner and new management entity, with a specific date of ownership or management change. The transfer is automatic and the existing permit remains in effect unless Ecology notifies the new owner of the need to modify, revoke, or re-issue the permit with revised requirements or conditions prior to the specified change date. The proposed rule specifies the timeframe an owner must provide notification to allow department review and approval of proposed new owners or management entities.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: This proposed change allows the department time to review the permit application and management plan of the proposed new owner or management entity to ensure the applicable requirements of the chapter are met prior to any change. The department expects these proposed changes will provide three benefits:

- LOSS owners will benefit from active department permitting actions and notification of decisions;
- LOSS owners avoid unnecessary complications should the new owner or management entity be ineligible to own or operate the LOSS; and
- LOSS customers gain certainty that the owner named on the permit is responsible for operating and maintaining the LOSS.

Costs: The cost associated with a change in ownership or management entity is the cost of preparing and submitting a permit application and revised management plan. The department assumes these costs will vary depending on the type of ownership and complexity of the LOSS.

The management plan for a single owner LOSS contains relatively standard conditions and duties. The new plan is likely to contain the same information as the existing plan with minor variations such as owner or management entity name and address. The department assumes there will be little time and materials needed to prepare the permit application and update the management plan resulting in a minor cost for this type of change.

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Management plans for LOSS serving individually owned lots or units are more complicated since management entity duties are often extensive and LOSS specific. The department estimates the cost to prepare and submit an amended management plan that identifies new management entity duties, but incorporates the remaining information from the existing management plan, ranges from \$2,000 - \$5,000. The department estimates cost associated with a completely new management plan ranges from \$5,000 - \$10,000 depending on the complexity of the system, ownership structure, and management entity duties.

Given the range of possibilities for ownership and management of a LOSS, the costs of the proposed rule range from \$0 to \$10,000.

Part 3: Site and Environmental Review Requirements

Section 03200, Environmental review – Site risk survey

The significant changes in the proposed rule modify LOSS site evaluation requirements and include:

- More detailed descriptions of the physical characteristics of the primary and reserve drainfield;
- Well logs for all existing wells within 1,000 feet of the drainfield, and
- A screening nitrate balance.

The proposed rule requires owners to complete a new assessment tool, the site risk survey (SRS). The SRS includes both existing required information as well as the additional information identified above, and is designed to identify and evaluate potential impacts to public health and the environment from a LOSS. An SRS may be required for proposed new construction, proposed modifications and expansions of an existing system, or as a permit requirement for an existing LOSS.

The new requirements identified above affect only low volume LOSS. High volume LOSS are currently required by Ecology to submit the information required in the proposed rule as part of the wastewater treatment plant engineering documents. Relevant Ecology requirements are found in WAC 173-240-060(4), Chapter 173-201 WAC, and the Criteria for Sewage Works Design.

All other requirements of the proposed rule are consistent with department and Ecology requirements and do not require analysis.

Benefits: Successful LOSS start with choosing a suitable site. LOSS site selection and approval depends heavily on the site evaluation, which includes several factors such as soil suitability, environmental conditions, and potential environmental impacts of a LOSS at the site. The SRS requirements improve the accuracy and adequacy of the information submitted to the

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department, and fulfill the department's new statutory obligation to evaluate environmental impacts of a LOSS.

Costs: The department assumes the costs to complete an SRS will vary depending on the specific site conditions and details of the planned LOSS, e.g., type of treatment. Potential costs include those related to research and preparation of the SRS, including compiling existing well logs, and completing a screening nitrate balance.

A screening nitrate balance requires water sample collection and laboratory analysis. Well logs can be obtained from Ecology; Department of Health, Office of Drinking Water; or Local Health Jurisdiction. Other information and materials needed to complete the SRS is usually readily available and not time consuming to collect and record. However, for more complex LOSS or site conditions, the services of a professional engineer may be required to develop the SRS.

Based on stakeholder input, the department assumes costs for completing and submitting an SRS, including a nitrate screening balance and a well log report, range from \$300 to \$1,700.

Section 03300, Environmental review – Hydrogeology report

The significant changes in the proposed rule establish hydrogeology report (HGR) requirements including:

- Further analysis of site conditions identified in the SRS;
- Mitigation measures to reduce or eliminate potential impacts; and
- A ground and surface water monitoring plan, as appropriate.

This proposed section establishes the requirements for an HGR when the results of an SRS are inconclusive to evaluate the potential impacts to public health and the environment or indicate risk to public health or the environment from a LOSS. An HGR may be required for proposed new construction, proposed modifications and expansions of an existing system, or as a permit requirement for an existing LOSS.

The requirements identified above are new only for low volume LOSS. High volume LOSS are currently required by Ecology to submit substantially similar information under WAC 173-240-060(4), Chapter 173-201 WAC, and the Criteria for Sewage Works Design.

Benefits: An HGR is an in-depth evaluation of the potential impacts of a LOSS on public health and the environment and proposed monitoring and mitigation. An HGR is used to determine if the site is suitable for a LOSS and aids in appropriate LOSS sizing and design. Having detailed site condition information can potentially save the cost of purchasing unsuitable property, and can decrease the likelihood of costly design changes later in the construction process. In some cases, an HGR may provide the additional information needed to demonstrate that a LOSS can successfully treat sewage on a marginal site that, without the detailed site information, would have been considered unsuitable.

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Another important benefit is preventing or reducing the risk of LOSS failing and the system needing to be shut down permanently due to financial or site restrictions. LOSS failure could force homeowners or business owners to connect to public sewer if it's available, or find a new place of residence and lose the value of their homes or buildings. While this rule does not completely eliminate this possibility, it is intended to reduce it.

Costs: The department assumes an HGR will rarely be required for low volume LOSS sites, and only for sites that are extremely sensitive. The cost of an HGR includes the services of a hydrogeologist to collect data, prepare analyses, and submit the report. The type and level of analysis in the report depends on site conditions and includes one or more of the following elements:

- Site specific nitrate balance;
- Mounding analysis;
- Nutrient balance;
- Water quality characterization;
- Hydraulic continuity; and
- Water monitoring plan.

Few HGRs will require all of the above analyses.

Most HGRs will require either a mounding analysis or a site specific nitrate balance. Based on information provided by stakeholders, department estimates the cost range of a mounding analysis from \$5,000 to \$10,000, and a site specific nitrate balance ranges from \$10,000 to \$25,000, depending on the tasks and site variables.

Groundwater monitoring costs typically include well sampling and lab costs. The department assumes groundwater monitoring includes 12 monthly samples, four quarterly reports, and an annual report. The department assumes that LOSS owners will take samples from existing wells on the property. Based on these assumptions and stakeholder input, the cost range for groundwater monitoring is estimated at \$5,000 to \$10,000. If monitoring wells must be installed, or someone more highly trained than an owner is required to take samples, the cost range estimates increase to \$25,000 to \$30,000.

Based on the cost information described above, the department estimates the full range of potential costs for an HGR from \$5,000 for a mounding analysis, to \$60,000 for a site specific nitrate balance and groundwater monitoring that requires well-drilling and the services of a professional.

Part 5: Construction Requirements

Section 05000, Installer requirements

The significant changes in the proposed rule establish qualifications for individuals who install a LOSS or LOSS component including:

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- Local health jurisdiction approval from the county in which the LOSS is located; and
- Experience -
 - Three or more years experience installing on-site sewage systems; or
 - A record of successfully completing one similar installation that includes a pressure distribution drainfield.

Under the current LOSS rule, owners are responsible for hiring someone qualified to install a low volume LOSS or LOSS components. However, there is no further explanation or criteria provided to help owners determine who is qualified. For large volume LOSS, Ecology allowed general contractors to do installations without qualifications specific to LOSS installation. To provide clarity and consistent regulation, and to protect public health and the environment, the department based the proposed qualifications on local health jurisdiction installer programs that certify, register, or approve installers for on-site sewage systems with design flows below 3,500 gpd.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: According to stakeholder interviews, experienced installers are more likely to install a LOSS as designed and reduce both LOSS owner construction costs and long-term operating and maintenance costs. Properly installed LOSS are also less likely to fail thereby protecting the public from exposure to untreated sewage and protecting the environment from sewage contamination. Proper installation also prevents the need for costly repairs or replacement of the LOSS. An example of a failed LOSS related to improper installation is at Ft. Flagler state park in Port Townsend. An unqualified installer installed the drainfield incorrectly and it failed almost immediately. Costs included replacing the LOSS, and pumping and hauling most of the effluent while the LOSS was being replaced.

In addition, the proposed rule provides more consistent installation requirements for on-site sewage systems by using existing local health jurisdiction installer approval programs.

Owners benefit by knowing how to meet the requirement to hire a qualified installer, and installers know the methods to demonstrate or gain the required experience.

In addition, by reducing the risk of system failures, the rules also reduce the risk of a system being permanently shut down, which avoids the related costs for home and business owners to connect to public sewer or move and lose property values.

Costs: Gaining local health jurisdiction approval requires submitting a completed application and a fee to the local health jurisdiction for review and approval. In addition, some counties require competency testing. Fees for registration, certification, or approval range from \$100 to \$600, and annual renewal costs range from \$0 to \$300, depending on the county.

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Based on information from stakeholders, including installer interviews and local health jurisdiction comments, the department anticipates there are ample qualified installers available who can meet the experience requirements of this section. As such, there is no additional cost to the owner to hire an installer who meets these requirements.

Installers who meet the experience requirements of the proposed section may incur the cost of local health jurisdiction approval if not already approved. The department did not identify specific costs for new installers to gain the required experience. However, since working with a more experienced installer during one installation of a LOSS qualifies toward meeting the proposed requirement, the department assumes the cost is minimal.

Section 05100, Construction oversight and testing

The significant changes in the proposed rule modify requirements for construction oversight and testing by requiring a design engineer or authorized representative to:

- Conduct or witness water tightness testing of sewage tanks for low volume LOSS; and
- Pretest the drainfield of high volume LOSS and record and submit the results to the department during final inspection.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: The proposed new requirements for sewage tank water tightness testing for low volume LOSS, and drainfield pressure system pre-testing for high volume LOSS, provide consistent regulations for all LOSS. Design engineers or their representatives are in the best position to verify the LOSS and its components are constructed and operating according to the approved design.

Water tightness testing reduces or prevents the possibility that sewage tanks will leak. When sewage tanks leak, partially treated sewage can back up into structures or leach into surrounding areas, potentially contaminating ground and surface water, and drinking water wells. This proposed rule reduces the risk of human exposure to and environmental contamination from partially treated sewage. Testing at the construction site verifies the tank is watertight and operating properly.

Pre-testing the drainfield provides better assurance that the pressure system is working as designed. This reduces the risk of partially treated sewage surfacing thereby reducing the risk of human exposure and environmental contamination. Even distribution of effluent allows soil to perform the expected treatment without being overloaded or plugged with biomat.

Both water tightness testing and drainfield pretesting allows the owner to identify and replace leaking tanks and address drainfield deficiencies before the system is permanently covered and authorized to operate, potentially avoiding additional repair or replacement costs later.

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These proposed construction oversight and testing requirements are also designed to increase efficiency. The department experiences a high rate of cancelled inspections typically due to LOSS project construction delays, incomplete testing, or incomplete testing results. Consistent with the proposed rule, the department will schedule inspections after critical components are tested and the results are submitted to the department. The department anticipates that there will be fewer cancellations as a result of this practice.

Based on installer interview results and department on-site sewage system expertise, the department believes owners will experience reduced long-term operation and maintenance costs, including sewage tank and drainfield repair and replacement costs.

Costs: Based on stakeholder interviews, the department estimates the cost range for a design engineer to conduct or witness water tightness testing of sewage tanks for low volume LOSS at \$200 to \$500 per tank. This includes design engineer time for two site visits to observe tank testing. The department assumes the number of sewage tanks needed for a LOSS could range from one to six tanks. The overall cost range for this proposed requirement is \$200 to \$3,000.

Based on interview results, the cost to pre-test the drainfield of a high volume LOSS, and record and submit results to the department ranges from \$800 to \$1,200.

Section 05200, Water tightness testing of sewage tanks

The significant change in the proposed rule establishes water tightness testing protocols for sewage tanks and includes:

- Vacuum testing; or
- Water-pressure testing.

The proposed rule incorporate substantially similar Ecology water tightness testing methods; therefore, the proposed changes affect only low volume LOSS.

Benefits: Establishing proven water tightness testing protocols in rule provides consistent sewage tank testing that results in meaningful test results. Consistent testing methods allow for reliable interpretation of information and more certainty that the results are accurate. In this case, providing consistent testing methods increases certainty that sewage tanks function as designed and prevent partially treated sewage from backing up into structures or leaching into surrounding areas. This proposed rule reduces the risk of human exposure to and environmental contamination from partially treated sewage.

Reliable water tightness testing allows the owner to identify and replace leaking tanks before the system is permanently covered and authorized to operate, potentially avoiding additional repair or replacement costs later.

Costs: The department did not include costs for this section as water tightness testing costs are included in the analysis for section 05100, Construction oversight and testing.

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Part 6: Construction Requirements

Section 06250, Treatment

The significant changes in the proposed rule modify treatment requirements by:

- Eliminating treatment standards 1 and 2 from WAC 246-272B-01001; and
- Incorporating effluent treatment standards from Table III, WAC 246-272A-0110, with the following modifications:
 - Add a high quality effluent (HQE) treatment level. This allows use of new technologies and mechanical treatment that treat sewage to very high levels but do not have department-developed standards and guidance.
 - Eliminate Treatment Level A, used in 272A, discourages use of disinfection treatment for LOSS when not necessary (3 feet of soil is adequate for fecal coliform reduction) and relies on levels C, B, and HQE when a higher level of treatment is necessary.
 - Eliminate Treatment Level D used in WAC 246-272A-0110. No public domain treatment technology provides this level of treatment in combination with LOSS drainfield size requirements.
 - Split treatment level N (Nitrogen) into N₁₀ and N₂₀ and add P (Phosphorus). This will help the department address environmental protection concerns for nutrient loading specifically to meet water quality standards contained in Chapter 173-200 WAC.

The proposed significant changes are more consistent with WAC 246-272A-0110, provide more specific treatment standards, and recognize the option for advanced treatment.

For high volume LOSS, the proposed section sets new requirements by including drainfields as part of the treatment train. They will now get treatment credit for drainfields, and use LOSS treatment standards. Currently, Ecology regulates effluent parameters through primary, secondary, and tertiary treatment levels with similar values. The proposed rules establish consistent treatment standards for all sizes of LOSS that are equally protective of the environment and public health.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: The proposed rule recognizes the department's new responsibilities for regulating mechanical and advanced treatment LOSS which weren't analyzed and approved by the department in the past, and provides flexibility in developing treatment by providing more options throughout the treatment train. Flexibility is provided by allowing current and future advances in treatment technologies and treatment credit for the drainfield in high volume LOSS. The proposed rule includes new treatment levels, such as a HQE and P, that were not available or in use when the LOSS rule was last amended. Including new treatment levels based

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on technology advances allows LOSS owners more options for new construction projects and for repairs, and may allow installation of LOSS in marginal areas that previously would not have been approved due to site conditions. These systems can rely more heavily on the sewage treatment from technology rather than on treatment from soil, and still be protective of the environment and public health.

The rules also reduce the risk of a system being permanently shut down by reducing the risk of system failures, which avoids the related costs for home and business owners to connect to public sewer or move and lose property values.

Costs: Based on stakeholder input and interviews, the department anticipates there is no additional cost to owners for the updated performance based treatment level requirements in the rule, since treatment technology manufacturers have already changed their products to comply with requirements in Chapter 246-272A WAC, On-site sewage systems.

Section 06350, Drainfields

The significant changes in the proposed rule modify drainfield requirements by:

- Requiring pressure distribution with timed dosing for all LOSS;
- Defining “nearby” as one-half mile from the property served; and
- Allowing reductions to design loading rate, vertical separation, and constructed drainfield capacity, when offset conditions exist, such as use of treatment level HQE.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: By requiring pressure distribution with timed dosing for all LOSS, the proposed rule allows for more even consistent distribution of effluent into the surrounding soil. Even distribution of effluent allows soil to perform the expected treatment without being overloaded or plugged with biomat. Timed dosing meters the flow and reduces the risk of drainfield failure, which can result in partially treated sewage surfacing. Requiring timed dosing will decrease the risk of human exposure and environmental contamination.

By defining “nearby” as one-half mile from the property served, the proposed rule provides environmental and public health protections by minimizing the possibility for damage to effluent transport lines and drainfield. Long sewers are more susceptible to natural event damage, such as flooding, and also human caused damage, such as accidental damage during road construction or repair. Owners also avoid certain operation and maintenance costs attributed to long sewer lines.

Drainfields are also better protected simply because the owners and users of the LOSS are more aware of the need to protect the drainfield from damage. Drainfields located away from the properties served, or near properties and people who do not know the drainfield exists, may be

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accidentally damaged through inappropriate activities on or near the drainfield. These activities could include driving on, digging in, or dumping waste on the drainfield. Lastly, when drainfields are near the properties served, problems with the drainfield can be more quickly identified because the users and LOSS operator can observe the drainfield more easily due to proximity.

It is rare that a LOSS owner requests the drainfield be located more than one half mile from the facilities served and is often related to site conditions where soils and vertical separation are not adequate to meet the requirements of the current rules. This coupled with the limited treatment options available in rule for such site conditions can prohibit the placement of the drainfield on the property served.

Currently there are no more than twelve permitted LOSS with drainfields located more than one half mile from the facilities served, and these are mostly larger municipal systems. The department assumes the flexibility in the proposed rule that allows reductions to design loading rate, vertical separation, and constructed drainfield capacity, when offset conditions exist, such as use of treatment level HQE, benefits owners by providing more options in placing drainfields on the property served when marginal site conditions exist.

Also, by reducing the risk of system failures, the rules also reduce the risk of a system being permanently shut down, which avoids the related costs for home and business owners to connect to public sewer or move and lose property values.

Costs: Based on information provided by stakeholders and technical experts, the department assumes that any additional cost related to defining “nearby” as one-half mile from the property served is offset by the flexibility provided by allowing reductions to design loading rate, vertical separation, and constructed drainfield capacity, when offset conditions exist, such as use of treatment level HQE.

Based on the information received from stakeholders and technical experts, the department also assumes there are no additional costs to LOSS owners for requiring pressure distribution with timed dosing for all LOSS. It is the industry standard today.

Section 06450, Sewage tanks

The significant changes in the proposed rule modify drainfield requirements by increasing the minimum sewage tank size, including grease interceptors, from 900 gallons to 1,000 gallons. This also applies to tanks installed at each single family residence in a Septic Tank Effluent Pumping (STEP) system.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: Larger sewage tanks provide additional dilution and increased residence time to compensate for higher sewage strength related to increased use of low flow fixtures and high

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density housing. Use of these fixtures and higher housing densities without adequate dilution and residence time can increase sewage strength beyond anticipated levels, and create the potential for insufficiently treated sewage being discharged into the drainfield. The proposed rule increases public health and environmental protections by maintaining anticipated waste strength and designed treatment.

Costs: Because 1,000 gallon tanks have become the new industry standard-sized tank, the department assumes there is no additional cost for changing the requirement from 900 gallon to 1,000 gallon sewage tanks. This applies to both septic tanks and grease interceptors.

Section 06550, Public domain and proprietary technologies

The significant changes in the proposed rule modify public domain and proprietary treatment technologies requirements by:

- Removing the existing prohibition for alternative treatment technology that does not have a department-approved recommended standards and guidance (RS&G); and
- Providing procedural requirements for demonstrating the effectiveness of alternative technologies.

Although Ecology did not include alternative treatment technology evaluation criteria in rule, Ecology historically consulted the department when owners proposed alternative LOSS treatment, or evaluated its merits based on the engineering submittals for mechanical treatment. The department applied the existing department rules and guidance in these circumstances; therefore, all LOSS followed the same department rules and standards.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: The proposed rule includes the existing criteria used by the department to evaluate treatment technologies and develop technology-specific RS&Gs. Owners benefit from the proposed rule because it provides a performance-based standard for evaluating the effectiveness of alternative treatment technologies rather than limiting technology use to only those individually-approved, technology-specific treatment options.

The proposed rule allows owners to continue using treatment technologies with RS&Gs with no additional justification required if the technology is used consistent with the approved RS&G. However, they can also submit information required by the proposed rule for broader use of a technology with an RS&G, and for other technologies not previously reviewed or approved by the department. The proposed rule provides a more flexible process for use of alternative treatment technologies. This is expected to result in effective and safe use of LOSS on marginal sites that would not otherwise have been approved.

Also, by reducing the risk of system failures, the rules also reduce the risk of a system being permanently shut down, which avoids the related costs for home and business owners to

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connect to public sewer or move and lose property values. While this rule does not completely eliminate the possibility of a LOSS failing, it is intended to reduce it.

Costs: The department assumes owners will not incur additional costs for use of alternative treatment technologies as the criteria included in the rule is consistent with the process used to gain approval of an RS&G.

Part 7: LOSS Operations Requirements

Section 07050, Operations and maintenance requirements

The significant changes in the proposed rule add new owner requirements related to operation and maintenance of low volume LOSS and include:

- Effluent monitoring permit requirements;
- Maintaining financial responsibility;
- Responding in a timely manner to customer complaints;
- Prohibiting bypassing any treatment component; and
- Using an accredited laboratory for sample testing.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: Effective, reliable sewage treatment removes pathogens and prevents waterborne diseases, drinking water well contamination, and surface and groundwater contamination. These requirements increase the likelihood that LOSS owners will operate and maintain their LOSS in a responsible manner. Owners and their customers also benefit from a clear understanding of owner responsibilities.

Using an accredited laboratory for sample testing ensures the accuracy of monitoring results, and allows owners to take corrective action when monitoring indicates a problem exists.

Costs: The department assumes there will be costs associated with monitoring requirements identified in the operating permit. Based on information gathered from stakeholders, the department estimates individual laboratory testing costs for the parameters as follows:

- Fecal coliform bacteria..... \$20
- BOD₅..... \$35
- CBOD₅..... \$40
- Nitrate..... \$30
- Total nitrogen..... \$50
- Total suspended solids..... \$25
- Grease and oil \$50
- Phosphorus \$30

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The department assumes fewer than 100 LOSS will be impacted by this requirement. The department also assumes the most common monitoring requirement would be quarterly monitoring for fecal coliform bacteria and nitrates with an average annual cost of \$200. For a small number of LOSS, depending on the site conditions and advanced treatment technology used, additional testing may be required. This could include more frequent monitoring of additional parameters such as CBOD₅, total suspended solids, and grease and oil. The department assumes the additional monitoring costs will be \$920 annually for monitoring these parameters eight times per year. Therefore, the department assumes the overall cost range for the proposed requirement is \$200 to \$1,120 annually.

The department assumes no additional owner costs to maintain financial responsibility, respond to customer complaints, or avoid by-passing treatment components. The costs of using an accredited laboratory for sample testing are included in the laboratory testing costs listed above.

Section 07200, Operator qualifications and responsibilities

The significant changes in the proposed rule modify LOSS operator requirements and include:

- Identifying when the operator must be Ecology certified or approved by the local health jurisdiction; and
- Setting operator training criteria for proprietary treatment products.

For low volume LOSS, the existing department rules require a qualified operator for each LOSS without identifying specific operator qualifications. Ecology management entity requirements include identification of operator duties for high volume LOSS that use mechanical treatment. The proposed rule incorporates the certified operator requirements for high volume LOSS from Chapter 173-230 WAC such as for lagoons and mechanical treatment. The proposed rule clarifies the requirement for a qualified LOSS operator and establishes consistent operator qualifications in rule by incorporating existing programs at Ecology and Local Health Jurisdictions (on-site sewage system maintenance provider approval per WAC 246-272A-0340).

For systems using proprietary treatment products, the proposed rule requires the owner to employ an operator qualified to monitor and maintain the system and lists methods to demonstrate the operator is qualified.

All other requirements of the proposed rule, including Ecology operator certification, are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: Operator requirements in this rule recognize that complex treatment technologies require skilled operators to assure performance and proper long-term function of the LOSS. By ensuring operators understand the proper function of the LOSS and are trained to perform necessary operation and maintenance duties (such as reading equipment to monitor flow), these requirements provide environmental and public health benefit. The proposed rules

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increase the likelihood that potential problems are identified and corrected early and reduce the risk of operation and maintenance errors and LOSS failure. A properly operated LOSS also reduces long-term need for costly repairs or replacement of equipment.

The authorizing statute and this rule place an increased emphasis on environmental protection. This rule also allows for reductions in drainfield size, constructed capacity, or soil depth with offsetting safety measures provided by increased treatment. These factors will result in an increased reliance on complex treatment technologies to meet rule standards.

The ability to develop marginal sites that may not have been approved in the past offset the costs associated with operator requirements. With increasing population and concern for the quality of shared resources such as ground and surface water there is a public benefit to requiring better maintenance and operation of LOSS.

The proposed rules also reduce the risk of a system being permanently shut down by reducing the risk of system failures, which avoids the related costs for home and business owners to connect to public sewer or move and lose property values. While this rule does not completely eliminate the possibility of a LOSS failing, it is intended to reduce it.

Costs: The department assumes there will be a cost to acquire local health jurisdiction approval for operators of low volume LOSS and for operators of high volume LOSS that would not have been required to have operator certification under Ecology. Local health jurisdiction approval requirements vary and may include requirements related to experience, training, and continuing education such as classes provided by the Washington On-Site Sewage Association. The application process also varies and may include an exam and renewal fees. Based on stakeholder information, including local health jurisdictions, the department expects fees to be consistent with current costs for small on-site sewage system maintenance provider approval. Depending on the approval requirements of the county, the cost of this approval can range from \$55 to \$1,600. The cost of renewing approval could range from \$55 - \$400.

Because of liability issues, most proprietary treatment component manufacturers already provide direct service or require authorized or trained providers for their products as a condition of sale. The department assumes there are no additional operator costs for owners to hire operators with specific training in a particular proprietary treatment product since this is already required by product manufacturers as part of their sales agreements.

Section 7450, Failures

The significant changes in the proposed rule modify requirements related to LOSS failure by specifying the number of days an owner must notify the department and customers of failures and failure related activities. The proposed rule requires LOSS owners to notify:

- The department within one business day of discovering a failure; and
- Customers within ten business days when the department directs the owner to discontinue using the LOSS.

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All other requirements of the proposed rule are consistent with or substantially similar to department and Ecology requirements and do not require analysis.

Benefits: Prompt notification of failures allows the department to quickly determine the extent of the problem, minimize human exposure to and environmental contamination from surfacing sewage, and assess options to minimize damage to the system and its components. Absent a notification requirement, the department may not learn of a failure or may learn of it too late to prevent human exposure to and environmental contamination from untreated sewage and further damage to the LOSS.

Notification to customers within ten days after the owner receives notice of department-directed LOSS shut-down protects customers from surprise shut-downs and prevents potential property damage. Department intent is to allow customers time to make other living arrangements before permanent actions to shut down the LOSS are taken. Notification allows the department to take necessary prompt actions like closing shellfish areas to prevent illness outbreaks.

Costs: Although the proposed rule requires that department notification occur earlier than is currently required, the department assumes there is no additional cost associated with an earlier notification.

Owners will likely incur nominal costs to notify customers if they are directed by the department to shut-down the LOSS.

Section 07500, Abandonment

The significant changes in the proposed rule modify requirements related to LOSS abandonment by requiring LOSS owners to:

- Notify the department, local health jurisdiction, and all customers at least one year in advance of a planned abandonment; and
- Remove all electrical and mechanical equipment from the LOSS prior to abandoning the system.

All other requirements of the proposed rule are consistent with or substantially similar to existing department and Ecology requirements and do not require analysis.

Benefits: The department, local health jurisdictions, and customers benefit from the one year advance notice in order to investigate and arrange for other sewage disposal options. This is consistent with abandonment requirements for public drinking water systems.

The requirement to remove all electrical and mechanical equipment protects the public by eliminating the potential for accidental injury, and ensures the LOSS cannot be accidentally or intentionally re-activated.

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Costs: The department assumes owners will incur nominal costs associated with postage and materials to notify customers of a planned abandonment.

The department assumes the owner will remove electrical and mechanical equipment when performing other required abandonment activities on site, such as removing sewage tank lids and filling sewage tanks with soil, and may incur nominal incremental cost for the new activity.

Probable Benefit and Cost Conclusion

The department evaluated the qualitative and quantitative costs and benefits of the proposed rule, taking into account the specific directives of the statute, existing on-site sewage regulations, and domestic wastewater treatment regulations.

Benefit Summary

The primary benefit of these proposed regulations is to protect public health and the environment by reducing the risk of human exposure to and environmental contamination with untreated or partially treated sewage. These proposed rules include requirements and standards for proper siting, design, construction, installation, operation, maintenance, and repair of LOSS. They are intended to prevent the spread of disease by reducing the risk of waterborne disease or sewage contamination events. In the events highlighted in the Societal Benefits Analysis, the avoided costs, for one event, start at of \$150,000, which accounts for lost sales and product recalls of shellfish only. Costs associated with lay-offs, individual illness medical costs, and changing behaviors due to a waterborne illness outbreak are not calculated, but are assumed to be even higher.

The proposed rules also provide LOSS owners more options for new construction projects and repairs, and may allow installation of LOSS in marginal areas that previously would not have been approved due to limiting site conditions. Another important benefit is preventing or reducing the risk of LOSS failing and the system needing to be abandoned due to financial or site restrictions. LOSS failure could force homeowners or business owners to connect to public sewer if it's available, or find a new place of residence and lose the value of their homes or buildings. While this rule does not completely eliminate this possibility, it is intended to reduce it.

LOSS provide a valuable option for sewage management. LOSS can help communities more closely match development of sewage management facilities to growth and allow property development where small systems or public sewer isn't available or cost effective. LOSS repair also tends to be less disruptive to property owners and neighborhoods than centralized sewer repair.

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Cost Summary

There is considerable diversity among LOSS depending on the system size, site conditions, treatment techniques used, design complexity, age and condition of the system, number of customers served, and ownership and management structure. The department expects similar variability in the effects of the proposed rule on existing and proposed new LOSS, and as a result, the department assumes no LOSS will incur all the potential costs identified in the proposed rule. To illustrate how the variable circumstances could trigger potential costs, the department developed the following three possible scenarios.

Scenario 1 – Existing Permitted LOSS: In this scenario, the LOSS is an existing permitted system built after 1984 with a design flow of 4,000 gpd. The LOSS is functioning properly, but it is sited in an area where there are high nitrate levels in the groundwater. The new requirements, via permit conditions, call for investigation of LOSS nitrogen loading after treatment. The costs and activities include:

- \$700 for an SRS with a screening nitrate balance (\$500 assuming most information is readily available), and one year of monitoring (\$200 for 4 effluent nitrogen samples @ \$50 per sample).

For this scenario, the total additional cost to the owner from the proposed rule is \$700 if the department can determine from monitoring results that the LOSS is not contributing to the high nitrate levels in the groundwater.

Scenario 2 – LOSS Drainfield Replacement: In this scenario, the LOSS is an existing system built after 1984 with a design flow of 14,400 gpd and a failed drainfield. The drainfield can be replaced on the development property with no change in treatment. Existing soil information is limited for the new drainfield area and there is also a change of ownership. The cost and activities are as follows:

- \$1,200 for an SRS including a nitrate balance (\$1,000) and water quality samples (\$200);
- \$800 for additional engineering costs to provide additional mapping and submittals for the new drainfield design; and
- \$1,000 for preparing a new management plan.

In scenario 2, the total additional cost to the owner from the proposed rule is \$3,000.

Scenario 3 – New LOSS Construction Project: This new privately-owned LOSS will be designed for 95,000 gpd. It will be sited in an area with poor soil and, as a result, must have HQE treatment. The costs and activities are as follows:

- \$500 for the department site inspection fee;
- \$7,500 for preparing a management plan; and
- \$3,000 for water-tightness testing based on 5 tanks plus 1 pump chamber and 6 site visits for testing. (The department assumes the county will be handling individual tank permits for each home after the department approves a standard installation design, which is no change from existing practice.)

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For scenario 3, the total additional cost to the owner for the proposed rule is \$11,000. Using department estimates of \$20.00 to \$40.00 per gpd of design flow (excluding drainfield land purchase or lease costs), the cost of a 95,000 gpd project ranges from \$1.9 million to \$2.85 million. The additional costs from the proposed rule constitute a 0.4% to 0.6% increase. This is an example of a LOSS that would likely not have been permitted under the existing department or Ecology rules, and so the costs of the new rules are offset by the ability to develop a LOSS where it was not an option in the past.

Benefit and Cost Determination

The proposed rules are needed to protect public health and the environment through regulation of the siting, design, construction, installation, operation, maintenance, and repair of LOSS. While LOSS owners may incur additional costs to comply with the proposed new requirements, the proposed rule also offers owners ways to reduce costs and provides more flexibility in LOSS siting and design. The combination of identified quantitative and qualitative benefits translates into increased public health and environmental protection with lower societal costs that offset the incremental cost increases for LOSS owners.

Based on this analysis, the department determined that the probable benefits of the requirements proposed in Chapter 246-272B WAC are greater than the probable costs.

Section 6. What alternative versions of the rule did we consider? Is the proposed rule the least burdensome approach?

RCW 34.05.328(1)(e) requires that agencies determine, after considering alternative versions of the rule and this analysis, that the rule being adopted is the least burdensome alternative for those required to comply.

The department assessed compliance burdens of the various components of the proposed rule throughout the rulemaking process. The department incorporated changes to the proposed rule as technical issues and stakeholder comments were evaluated. At each stage of rule development, the department evaluated compliance burdens for owners and those providing the owner with professional services, such as design engineers, installers, and operators, and for local health jurisdictions. The department took into consideration these burdens and in several instances reduced the potential compliance costs by including alternatives that achieve the desired results.

The following examples demonstrate the department's efforts to make certain the proposed rule is the least burdensome that achieves the goals and objectives of chapter 70.118B RCW, Large on-site sewage disposal systems.

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Phasing-in permit requirements for LOSS constructed prior to July 1, 1984: The statute requires that all LOSS be permitted, including those previously excluded from this requirement such as those constructed prior to July 1, 1984. The department considered including all applicable requirements at one time for the pre-1984 LOSS permits. However, the department recognized that little information may be known about many of these older systems. Instead, the department determined that unless there is a known failure, the department will work with the LOSS owner over time to evaluate their LOSS and include permit conditions to keep it maintained and working properly. This approach provides the department adequate time to assess the LOSS, and provides owners adequate time to plan ahead for any future engineering or environmental review expenses.

Issuing LOSS operating permits before LOSS construction begins: Several new requirements now apply to LOSS construction including public comment requirements for certain LOSS sizes. The department considered continuing the current practice of issuing the LOSS operating permit after construction is completed. Instead, the department determined that issuing an operating permit prior to the department's approval to construct increases owner certainty and reduces construction delays and potential "re-construction" costs.

Phasing-in local health jurisdiction permit transfers: The department entered into a memorandum of understanding (MOU) with several local health jurisdictions to issue LOSS operating permits. Most of these MOUs have expired. The department considered setting a date in rule for these LOSS permits to return to the department. However, based on input from local health jurisdictions, the department determined that phasing-in permit transfers was a better option since it created a predictable schedule for owners, local health jurisdictions, and the department. This staggered approach is also consistent with how Ecology permits will transfer to the department. In addition, based on stakeholder comments, the proposed rule also includes a requirement for owners with local health jurisdiction permits to stay in compliance with the permit conditions until notified by the department of changes. Adding this requirement reduces instances of systems becoming out of compliance during the transition.

Removing prohibition on experimental treatment technologies: The department considered keeping the existing rule requirement that prohibits experimental treatment technologies unless there is a department published RS&G for the technology. The department determined the limitation proved a burden to owners since the RS&Gs are out of date or do not exist for all LOSS sizes. Instead, the existing criteria used by the department to evaluate treatment technologies and develop technology-specific RS&Gs are included in the rule. This provides a performance-based standard for evaluating the effectiveness of alternative treatment technologies rather than limiting technology use to only those individually-approved, technology-specific treatment options.

Requiring monitoring (sampling) at high risk and moderate risk sites: Monitoring, usually through a sampling requirement in the operating permit, is one way for owners and the department to make certain the LOSS is operating properly. The department considered

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including a sampling requirement for all LOSS regardless of size, site risk, or treatment technology. The department determined effluent and groundwater sampling is an unnecessary burden in many cases, such as for low risk sites with a design flow below 14,500 gpd. Instead, the rule relies on the results of the site risk survey and hydrogeology report to determine the type and frequency of monitoring necessary for LOSS located on moderate and high risk sites.

Private entities managing a LOSS: The department considered keeping the existing LOSS management entity requirement that allows private entity management of LOSS only when a public entity acts as a third party guarantor. The proposed rule makes two changes to this requirement. First, the proposed rule allows a private entity to manage a LOSS when there is a single owner, but still requires a public entity acting as third party guarantor for LOSS with multiple owners or units. Second, the department created an option for a UTC-regulated private entity to manage single and multiple owner LOSS, and act as a third party guarantor for other private entities managing LOSS. This second option was included in the proposed rule in response to stakeholder and public comments on the draft rule. The comments were largely in response and support of legislation introduced in 2010, though not enacted, that would have created a new type of private entity: a wastewater company regulated by the Utilities and Transportation Commission (UTC). Adding this option to the proposed rule increases owner choices for management entities, but only if legislation is passed and the UTC is required by statute to create and regulate wastewater companies.

Least Burdensome Determination

The department considered alternate versions of the proposed rule. In considering each requirement, the department chose the version that is the most flexible and least costly for the owners, while meeting the public health and environmental protection mandates of the underlying statute. Therefore, the department determines the proposed rule is the least burdensome alternative for those required to comply that achieves the goals and specific objectives of the underlying statute.

Section 7. Did we determine that the rule does not require anyone to take an action that violates another federal or state law?

Yes. The rule does not require those to whom it applies to take an action that violates requirements of federal or state law.

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Section 8. Did we determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless the difference is required in federal or state law?

The Department of Health determined that the rule does not impose more stringent performance requirements on private entities than on public entities.

Section 9. Did we determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, did we determine that the difference is justified by an explicit state statute or by substantial evidence that the difference is necessary?

No federal rule or program exists for large on-site sewage systems or other types of decentralized sewage systems. The rule does not differ from any applicable federal regulation or statute.

Section 10. Did we demonstrate that the rule has been coordinated, to the maximum extent possible, with other federal, state, and local laws applicable to the same activity or subject matter?

Yes. Chapter 70.118B RCW establishes the department as the single state agency responsible for the state-wide, comprehensive regulation of LOSS.

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Appendix A

List of Participants Who Provided Cost Information

The Department obtained cost information from the following individuals:

- Professional engineers:
 - Dave Jensen, Jensen Engineering
 - Scott Jones, Scott E. Jones and Associates
 - Dotti Ramey, ADC Engineering
- Licensed surveyor and Professional engineer:
 - Randy Hahn, Hahn Engineering & Land Surveying
- LOSS Installer and contractor:
 - Bill Stuth Jr., Stuth Company, Inc.
 - Bob Nation, Fextex Systems Inc.
- O&M service providers:
 - Matt Lee, Aqua Test
 - Kelly Wynn, Water & Wastewater Services
- Water quality lab analysis:
 - Casey Blake, AAA Superior Lab
- Local Health Jurisdictions:
 - Joe Laxson, Island County Public Health,
 - Brian Dickey, Chelan-Douglas Health District
 - Eric Evans, Kitsap County Health District
- Component & equipment manufacturers:
 - David Lowe, HD Fowler Company
 - Bob Nation, Fextex Systems Inc.
- Site & soil characterization/environmental monitoring firm:
 - Lisa Palazzi, Pacific Rim Soil and Water, Inc.
- Utilities/management entities:
 - John Poppe, West Sound Utility District
 - Clint Perry & Mark Nelson, Evergreen Valley Utilities

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APPENDIX B Cost Information

| Rule part & section | Description of item & cost range | Discussion |
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| <p>Part 2 – Subpart B 02400 - LOSS constructed before July 1, 1984</p> | <p>Complete LOSS application, pay permit fee: \$185 - \$1150 & potential permit conditions including:</p> <p><u>Engineering services</u></p> <ul style="list-style-type: none"> • Inspection /report w/system diagram: \$800 - \$1200 • Engineering Evaluation: \$1400 - \$3000 • O&M Manual: \$1000 - \$2000 <p><u>Add to or replace drainfield:</u> \$12 - \$15 per linear ft. of trench. Size depends on flows, soil, & other factors; construction cost range is: \$2000 for small expansion, up to \$100,000+ for complete new drainfield.</p> <p><u>Add treatment</u></p> <ul style="list-style-type: none"> • Design costs: \$5000-\$40,000 • Construction costs: ~\$10/GPD design flow range of costs (design + construction) is \$40,000 - \$150,000. | <p>Owner may complete own application (little or no cost) Permit fee is \$150 + \$0.01 per GPD design flow (3500-100,000GPD)</p> <p>Vast majority of existing systems without permits as of effective date of rule are expected to have design flows < 14,500 GPD</p> <p>It is likely that many owners of old systems will be subject to one or more permit conditions described in 02400. According to a knowledgeable engineer, the biggest cost factor is not size but available information (e.g. does as-built or O&M manual exist or does operator have good knowledge/memory of the system? If yes, lower cost; if no, higher cost. To summarize:</p> <ul style="list-style-type: none"> ○ <u>Small/well documented</u> systems - little or no cost ○ <u>Medium complex/size systems w/ some documentation</u> total costs could range from \$800 - \$3,000 ○ <u>Large systems w/no documentation</u> & all conditions apply except failure costs range is \$40,000-\$290,000. <p>NOTE: high end costs are expected to be rare & only slightly higher under new rule (incurred as a new permit condition) vs. the existing rule (incurred through the complaint process).</p> |
| <p>Part 2 – Subpart C 02550 - LOSS modifications</p> | <p>For LOSS repairs, expansions, improvements etc. – process and costs are similar to the existing rule; change in owner is also a modification.</p> <p>For most (95 %+) <u>single-owner</u> LOSS the management plan is relatively simple and easy to transfer or adapt for a new owner (little or no cost).</p> <p>For LOSS serving individually-owned units or lots, the management plan tends to be more complicated and potentially more expensive to modify. However, changes in ownership for this type of system are very rare. If/when such a change should occur (<1 % of all systems) the expense to modify the plan could range from \$2,000 - \$5,000.</p> | <p>Modifications could be repairs, expansions, improvements, change in owner or to management plan.</p> <ul style="list-style-type: none"> • For repairs, expansions, improvements etc. – process (and costs) are similar to existing rule; <p>Changes to LOSS ownership are rare in our experience, but if/when they occur the range of requirements and costs depend on timing and nature of the change, as well as what professional is employed to develop the plan; When such a change is anticipated the new owner must submit a</p> |

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| | In one case only (extremely rare) an owner applied to change the approved management plan from a single owner to a multiple owner plan (allows sale of individual lots), this required the full cost associated with a new plan of this nature. Estimated cost range: \$5,000-\$10,000 +. | permit application and <u>new management plan</u> for department approval 30 days prior to making the change. |
| Part 3 – Subpart B 03200 - Environmental review/ site risk survey | Establishes new requirement for a Site Risk Survey and details required contents, including a <i>screening nitrate balance</i> ; this balance may be waived if nitrogen treatment is provided; Cost range: \$300 to \$1700 with an average of \$1,000 for smaller systems; (see hydrogeology reports section for costs associated with larger systems) | Most of required information is easily available and was in practice already being required under the existing rule; exact contents of a nitrogen balance will vary, depending on site & soil characteristics and the professional who prepares it; the department has developed guidance in preparing a nitrate balance; the rule allows completion of the balance using existing literature and well logs. |
| Part 3 – Subpart B 03300 Hydrogeology report | This part is new and will <u>rarely be required for smaller systems</u> . Costs are divided into individual elements of a hydrogeology report; we expect all elements will only rarely be required for any given project; Estimated costs: <ul style="list-style-type: none"> o Water Table Monitoring: \$7,000 – \$9,000 o “Site specific” nitrate balance: \$10,000 - \$25,000 o Groundwater mounding analysis: \$5,000 - \$10,000 o Groundwater monitoring: \$5,000 - \$35,000* <p>* In some cases existing wells can be used, in others new wells must be constructed; high end includes new well construction and monthly sampling /quarterly reports)</p> | The department will require a hydrogeology report for larger systems (> 14,500 GPD) and rarely for smaller systems on extremely sensitive sites. For larger systems formally subject to Ecology regulation the change is not significant; for smaller systems costs could be significant; of all systems cost might be offset by allowing development of marginal sites. Some owners may be able to avoid this expense where high level treatment is proposed; expenses will vary; a big factor could be whether “site-specific” information is required (e.g. construction of one or more groundwater monitoring wells, etc.); |
| Part 5 05000 - Installer requirements | Adds specific experience to minimum qualifications: <ol style="list-style-type: none"> 1. three or more years experience installing OSS; or 2. a record of successful completion of at least one similar installation, including a pressure distribution drainfield. <p>Not considered a significant cost</p> | Interviews indicated there is no shortage of good, qualified (as defined in this rule) installers ; therefore <u>negligible cost to owner</u> ; Any additional cost is offset by value over lifetime of the system of assuring proper installation and reduced long term operation and maintenance costs; Practitioners who lack experience can perform some work under more experienced installer to obtain experience, lost work for unqualified contractors was not estimated. |
| 05100 - Construction oversight and testing | This requirement is not new, but this section adds some new details to requirements : Estimated costs for smaller systems: <ul style="list-style-type: none"> o Tank water-tightness testing - \$200 - \$500 per tank (water test) o Witness/conduct pre-test of pressure system \$300 to \$500 | Expressed as percent of total system design and construction costs, the cost of these inspections are estimated to be less than 1%. |

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| | <p>Estimated cost for larger systems > 14,500 GPD):</p> <ul style="list-style-type: none"> o Pretest pressure system, record & give results to DOH: \$800-\$1200 | |
| 05200 - Water tightness testing of sewage tanks | <ul style="list-style-type: none"> o Cost range for water test: - \$200 - \$500 per tank o Cost range for vacuum test - \$100 – \$250 per tank | Leak testing tanks can be accomplished with water test (requires 2 engineer visits) or vacuum test (only 1 visit needed but requires specific equipment. Did not obtain cost of vacuum- test equipment, but engineering costs are ½ the cost of the water test. |
| Part 6 – Subpart A 06350 - drainfields | (3) (new) defines “nearby” to mean drainfield is $\leq \frac{1}{2}$ mile from development served; | This requirement saves construction costs and long term O&M costs; intent is to assure drainfields are within reasonable distance from development served to assure proper O&M, and avoid performance and maintenance problems that result from excessively long transport lines. |
| 06450 - Sewage tanks | <p>(4)(b)(ii) – minimum liquid volume for all LOSS besides tanks serving individual lots is three times the daily design flow; this represents a 2x increase in minimum size for systems \leq 14,500 GPD; and 1.5x increase for systems > 14,500 GPD (due to reduced minimum design flow per lot for larger systems - from 360 to 270 GPD).</p> <ul style="list-style-type: none"> • cost for systems \leq 14,500 GPD = 3.7% of total construction costs • cost for systems \geq 14,500 GPD = 1.9% of total construction costs | <ul style="list-style-type: none"> • New standard is consistent with 272A; • Recent literature supports need for increased tank capacities because of (a) modern reduced-flow plumbing fixtures and (b) changes in user lifestyles; (testing shows increased tank effluent strength from all sources compared to older values) • Tanks are considered cheapest part of LOSS treatment train; • Cost of new standard is offset by (a) better lifetime performance and (b) reduced lifetime O&M costs. |
| Part 7 – Subpart A 07050 - Operation & maintenance requirements | <p>water quality sampling costs for one or more of the following parameters (with associated average lab costs):</p> <ul style="list-style-type: none"> • Fecal coliform bacteria.....\$20 • BOD₅.....\$35 • CBOD₅.....\$40 • Nitrate.....\$30 • Total nitrogen (N)..... \$50 • TSS.....\$25 • G&O.....\$50 • P.....\$30 | <p>The program expects more LOSS owners will be required to monitor and submit sample results for effluent and/or groundwater (water quality);</p> <p>The program expects 20% of systems will eventually be required to monitor for an average of two of the parameters listed. Frequency requirements will vary but the expected average frequency will be quarterly or annually.</p> <p>For a typical scenario an owner might have to submit quarterly results for fecal coliform bacteria and nitrates; so average annual costs in that case might be \$200.</p> |
| 07200 - Operator qualifications and responsibilities | <p>New rule requires owner employ a qualified operator or in certain cases, an Ecology certified operator:</p> <ul style="list-style-type: none"> • for systems > 14,500 GPD with mechanical treatment or a lagoon the owner must employ an Ecology-certified operator • for all <i>other</i> LOSS > 14,500 GPD the owner must employ an operator approved by the local health jurisdiction; | <p>The authorizing statute and this rule place an increased emphasis on environmental protection. It also allows for reductions in drainfield size, constructed capacity or soil depth with treatment; these factors will result in an increased reliance on complex treatment technologies to meet standards.</p> <p>Operator requirements in this rule</p> |

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| | <ul style="list-style-type: none"> • for systems \leq 14,500 GPD the owner must employ an operator approved by the local health jurisdiction • where a locally approved operator is required but is not available the owner must employ a qualified operator acceptable to the department. • Where proprietary treatment is used the owner must employ a qualified operator meeting one of following criteria: <ul style="list-style-type: none"> ○ has experience operating similar technology ○ is employed, trained or authorized by the treatment component manufacturer ○ has training or certification operating similar technology ○ Has other qualifications acceptable to the department <p>Cost Range:</p> <ul style="list-style-type: none"> • Cost range (depends on local requirements) for service provider to obtain initial approval: \$55 - \$1600 • Annual cost range to renew approval: \$55 - \$400 • Annual cost range for owner to retain qualified operator” <ul style="list-style-type: none"> ○ For smaller, simple systems \$0 - \$1000 ○ For larger & complex systems: \$2000 - \$10,000 | <p>recognize that more complex treatment technologies require skilled operators to assure performance and long term function. These requirements provide an environmental benefit and also reduce long term need for costly repairs or replacement of equipment.</p> <p>This rule provides flexibility for owners in meeting requirements.</p> <p>The requirement for an Ecology-certified operator is not new (no significant change or cost);</p> <p>Because of liability issues most proprietary treatment component manufacturers already as condition of sale provide direct service or require authorized / trained operators for their products (Significant change with no cost.).</p> <p>Existing owners & operators can become approved; otherwise the owner must hire a qualified operator. Counties test operators, charge fees, and sometimes require specific training (e.g. WOSSA class).</p> <p>Cost considerations: An increasing # of local health jurisdictions (particularly on the Westside) have O&M-provider approval programs;</p> <p>Cost to the provider to obtain and renew approval vary widely & depend on local requirements for experience, training, & continuing education; also application, exam, & renewal fees and whether a contractor license or bonding is required.</p> <p>*Cost to the owner to hire a qualified operator is more difficult to quantify & varies widely; cost depends on condition, size and complexity of the LOSS, influent waste strength, treatment & monitoring requirements. Some of these costs have been estimated elsewhere in this analysis (e.g. wastewater sampling costs);</p> <p>For many new systems higher annual costs associated with these operator requirements are offset by the ability to develop marginal sites and avoidance of significant costs to install and maintain public sewer service. With increasing population and concern for the quality of shared resources such as ground and surface water there is a public benefit to</p> |
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| | | <p>requiring better maintenance & monitoring of LOSS. Another benefit is the long-term creation of jobs (as operators).</p> |
| <p>07250 - Metering</p> | <p>3,500 – 14,500 GPD Although the section does not specifically require a flow meter (simply requires “flow monitoring devices or processes to measure influent sewage volume”) The associated costs of installing a flow meter are:</p> <ul style="list-style-type: none"> • LOSS using a drip system: \$250-\$350 • Medium sized LOSS (conventional pressure): \$1500 • Large LOSS with conventional pressure: \$2500 | <p>Meters sizing and cost depend on diameter of pipe the effluent flows through and flow rate; flow meters are less expensive for certain technology such as drip distribution (uses smaller pipe); larger systems with higher flows require a more expensive meter;</p> <p>Expressed as a percent of total construction costs the flow meter represents from ¼ to ½ of 1 percent of total installation costs; the benefit of requiring flow meters is that it makes it much easier to determine if the system is operating within the approved design flow (an important consideration); current practice is to rely on control panel features such as pump elapsed time meters and event counters (which are widely misunderstood and ignored by operators)</p> |