Final Regulatory Analyses:

Including the:

- Final Cost-Benefit Analysis
- Least-Burdensome Alternative Analysis
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

Chapter 173-180 WAC – Facility Oil Handling Standards
and
Chapter 173-184 WAC – Vessel Oil Transfer Advance Notice and Containment Requirements

By
Kasia Patora

For the
Spill Prevention, Preparedness, and Response Program
Washington State Department of Ecology
Olympia, Washington

June 2023, Publication 23-08-011

Publication Information

This document is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/SummaryPages/2308011.html

Contact Information

Spill Prevention, Preparedness, and Response Program

P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-7455
Website: Washington State Department of Ecology[1]

ADA Accessibility

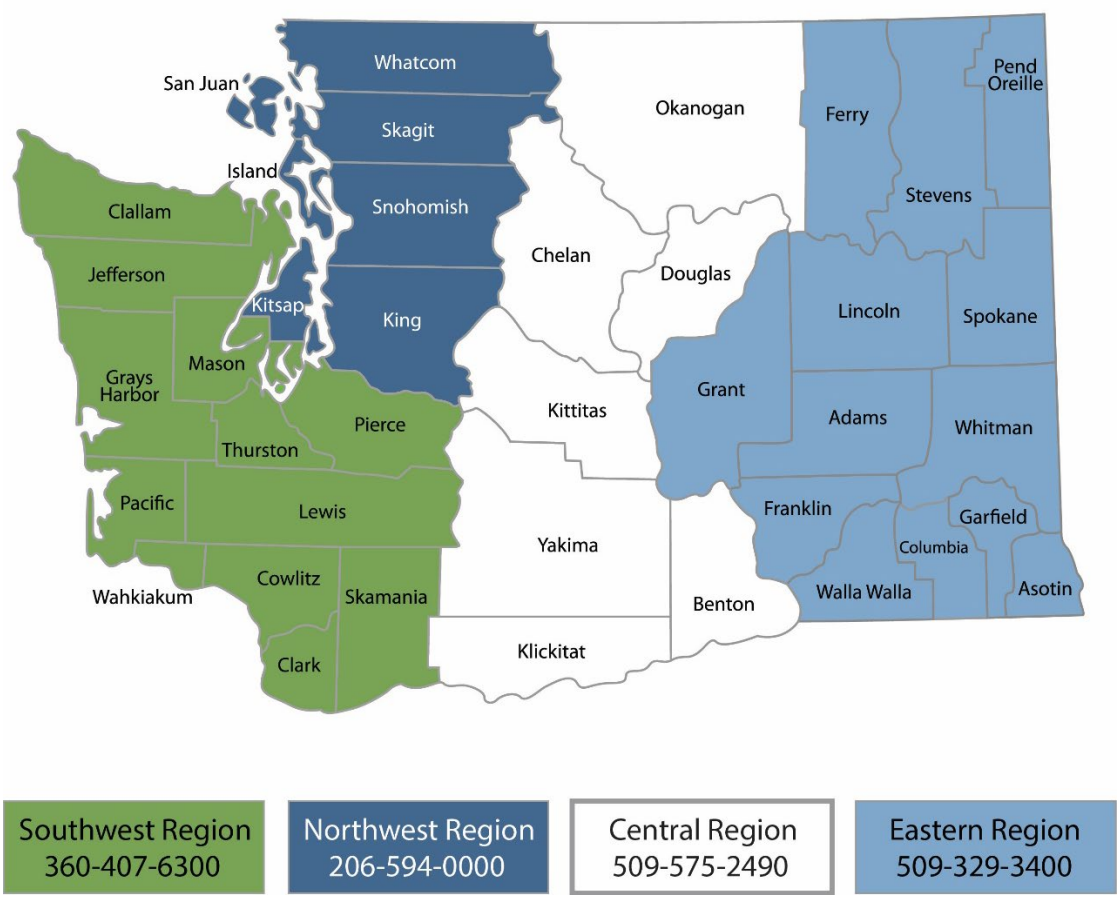
The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 360-407-6831 or email at ecyADAcoordinator@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit Ecology's website for more information.

[1] www.ecology.wa.gov/contact

Department of Ecology's Regional Offices

Map of Counties Served



Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	P.O. Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	P.O. Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	P.O. Box 46700 Olympia, WA 98504	360-407-6000

Final Regulatory Analyses

Including the:

Final Cost-Benefit Analysis

Least-Burdensome Alternative Analysis

Administrative Procedure Act Determinations

Regulatory Fairness Act Compliance

Chapter 173-180 WAC – Facility Oil Handling Standards and Chapter 173-184 WAC – Vessel Oil Transfer Advance Notice and Containment Requirements

Spill Prevention, Preparedness, and Response Program
Washington State Department of Ecology

Olympia, WA

June 2023 | Publication 23-08-011

DEPARTMENT OF
ECOLOGY
State of Washington

Table of Contents

Tables

Abbreviations

ANT	Advance Notice of Transfer
APA	Administrative Procedure Act
API	American Petroleum Institute
CBA	Cost-Benefit Analysis
CFR	Code of Federal Regulations
ESHB	Engrossed Substitute House Bill
FTE	Full-time employee
LBA	Least Burdensome Alternative Analysis
NAICS	North American Industry Classification System
NPREP	National Preparedness for Response Exercise Program
OTRP	Oil Transfer Response Plan
PIC	Person in Charge
RCW	Revised Code of Washington
RFA	Regulatory Fairness Act
WAC	Washington Administrative Code

Executive Summary

This report presents the determinations made by the Washington State Department of Ecology as required under Chapters 34.05 and 19.85 RCW, for the adopted amendments to the following rules:

- Facility Oil Handling Standards (Chapter 173-180 WAC), and
- Vessel Oil Transfer Advance Notice and Containment Requirements (Chapter 173-184 WAC).

This includes the:

- Final Cost-Benefit Analysis (CBA)
- Least-Burdensome Alternative Analysis (LBA)
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

The Washington Administrative Procedure Act (APA; RCW 34.05.328(1)(d)) requires Ecology to evaluate significant legislative rules 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 law being implemented." Chapters 1 – 5 of this document describe that determination.

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes. Chapter 6 of this document describes that determination.

The APA also requires Ecology to make several other determinations (RCW 34.05.328(1)(a) – (c) and (f) – (h)) about the rule, including authorization, need, context, and coordination. Appendix A of this document provides the documentation for these determinations.

The Washington Regulatory Fairness Act (RFA; Chapter 19.85 RCW) requires Ecology to evaluate the relative impact of rules that impose costs on businesses in an industry. It compares the relative compliance costs for small businesses to those of the largest businesses affected. Chapter 7 of this document documents that analysis, when applicable.

The rule amendments make the following changes:

- Chapter 173-180 WAC – Facilities:
    - Extending timelines and contents of recordkeeping requirements.
    - Adding flexibility in transfer equipment testing standards.
    - Adding resubmission criteria and required contents to Advance Notice of Transfer (ANT) for Class 1, 2, and 3 facilities.

- Specifying process timing for Equivalent Compliance Plan submittal and approval.
- Removing ineffective oil transfer procedure requirements.
- Adding seismic requirements for storage tanks.
- Adding seismic requirements for transfer pipelines.
- Adjusting process and requirements of Class 1 and 2 Operations Manual submittal.
- Defining substantial change in a Class 1 facility's oil-handling capacity.
- Clarifying required follow-up training.
- Adjusting timing, update, and notification requirements for Class 1 and 2 Training and Certification Programs.
- Expanding Class 1 facility Prevention Plan contents including secondary containment and risk analysis criteria and timing.
- Expanding Class 2 facility Oil Transfer Response Plan format and content requirements.
- Specifying drill requirements for Class 2 facilities.
- Adding out of service and decommissioning requirements for Class 1 facilities.

- Chapter 173-184 WAC – Vessels:
  - Expanding recordkeeping and records availability requirements.
  - Adjusting timing, resubmission criteria, and contents of ANT for delivering vessels.
  - Clarifying Rate A prebooming requirements for safe and effective threshold values for locations not covered in the report and for lightering.
- Both rules:
  - Adding definitions to facilitate rule requirements.
  - Specifying Ecology enforcement actions regarding noncompliance.
  - Specifying compliance schedules for new rule requirements.
  - Removing the option to submit paper or faxed copies of reports and plans.
  - Streamlining the conditional approval process and requirements for:
    - Safe and Effective Threshold Determination Reports.
    - Equivalent Compliance Plans.
    - Class 1 facility Prevention Plans and Operations Manuals.
    - Class 2 facility Oil Transfer Response Plans and Operations Manuals.

        - Class 1 and 2 facility Training and Certification Program.
    - Expanding Rate A prebooming and alternative measures requirements:
        - Recommended consideration of additional prebooming.
        - Reporting criteria and contents of Boom Reporting Form.
        - In cases of multiple simultaneous transfers.
    - Expanding required contents of Safe and Effective Threshold Determination Report.
    - Clarification and reorganization without material impact.

COSTS

We estimated the quantifiable costs below, associated with the rule amendments.

Table 1: 20-year present value costs of the rule amendments

WAC Chapter	Amendment Category	Low-End Costs	High-End Costs
173-180	Recordkeeping	**$215,170**	**$215,170**
173-180	Oil transfer procedure	**$0**	**$226,891**
173-180	Seismic - Tanks	**$8,264,419**	**$452,797,211**
173-180	Seismic - Transfer pipelines	**$11,885,333**	**$36,878,708**
173-180	Follow-up training	**$0**	**$0**
173-180	Prevention plan	**$824,215**	**$824,215**
173-180	OTRP	**$215,170**	**$215,170**
173-180	Drills	**$69,700**	**$69,700**
173-180	Out of service	**$528,473**	**$1,056,946**
173-184	Recordkeeping	**$5,660**	**$5,660**
173-184	Prebooming	**$0**	**$0**
Both rules	ANT	**$186,373**	**$765,985**
Both rules	Prebooming	**$192,281**	**$384,561**
Both rules	SETD report	**$95,326**	**$95,326**
OverallL	Total Costs	**$22,287,956**	**$493,341,378**

BENEFITS

While we could not fully quantify total present value benefits of the rule amendments, we estimated the quantifiable spill volumes that, if avoided because of the amendments, would fully offset costs. We also partially quantify or qualitatively discuss other benefits of avoided spills and improved preparedness.

Using estimates presented in an Oregon tank farm earthquake study,[2] based in recent review of relevant literature, we estimated a subset of corresponding costs of oil spills per gallon. Based on those per-gallon costs, we estimated the following range of spill size that would offset estimated 20-year present value costs of the rule amendments. Recall that these avoided spill

[2] Ibid.

volumes would not manifest as a single avoided spill, but as a total avoided spill volume across all Class 1 facilities in the state (in the event of a large earthquake) and to a lesser degree all regulated entities (through improved preparedness). Note also that these avoided spills would not need to occur at the same time, and could be distributed over time across multiple seismic events.

Table 2: Spill prevention needed to offset costs

Total 20-Year Present Value Cost	Cleanup, Habitat Restoration, and Navigation Cost (per gallon)	Total Equivalent Volume of Avoided Spills (gallons)	Percentage of Class 1 Storage Tank Volume
$22,287,956	**$1.66**	**13,396,006**	**0.90%**
$22,287,956	**$8.92**	**2,497,700**	**0.17%**
$493,341,378	**$1.66**	**296,519,058**	**19.92%**
$493,341,378	**$8.92**	**55,286,297**	**3.71%**

Avoided property value impacts

We estimated property value impacts between $86 million and $258 million resulting from large nearby spills at all Class 1 facilities. These impacts would vary depending on spill attributes, currents, and property characteristics.

Avoided facility losses

Sightline Institute identified property values of over $2.4 billion at the five refinery properties in Washington. If just these five (of 23 Class 1) facilities avoided losing between 1% and 21% of their property value due to earthquake losses due to damaged storage tanks and transfer pipelines, because of improvements made under the rule amendments, it would offset our estimated total 20-year present value costs of the rule.

To clean up spills and repair or replace equipment, Class 1 facilities would also likely shut down for some period of time. The degree of shutdown would depend on the degree of damage, and whether impacts to other parts of the facility were driving factors. For illustration, one article estimated a single shutdown event could, on average, cost a refinery $36.4 million. Another estimated that depending on profit margins and oil prices, an average refinery could lose between $340,000 and $1.7 million per day of shutdown. A third article places costs of downtime at a lower $2 million per episode. GE estimated the hidden costs of lost or deferred production as $20,000 per day, and identified that 3.65 downtime days can cost organizations in the oil and gas industry over $5 million.

We could not fully quantify benefits of the rule amendments in terms of reduced impact to:

- Cultural values and environmental justice.
- Surface water quality.
- Groundwater quality.

- Fisheries.
- Shellfisheries.
- Bird populations.
- Sea mammals.
- Endangered species.
- Animals consuming contaminated fish or shellfish.
- Recreational quality.
- Passive or non-use values for nature.
- Public health and safety:
    - Fire.
    - Air quality.
    - Toxic chemical exposure.
    - Drinking water contamination.
    - Subsistence or traditional food source contamination.
    - Evacuation.
    - Property damage and contamination.

Impacts to Tribes and Tribal resources

Oil spills have direct and indirect impacts to Tribal resources and lifeways, and many Class 1 facilities are located near Tribal lands. Direct impacts of spills include harm to resources such as fisheries and shellfisheries, through reduced access or ongoing contamination. These fisheries hold significant economic and subsistence values, and impacts can range from reduced market harvest, to reduced nutritional and calorie availability, to increased contamination of fish (and associated health impacts or foregone consumption), to reduced access to restoring and maintaining tribal lifeways for future generations. Spills create direct and indirect harm to land, waters, and animals (including fish and orcas) held in spiritual reverence and seen as family.

Value of avoiding spills

For the 2.8 million households in Washington, the collective willingness to pay to avoid spill impacts for a decade would be $259 million (2022$) for ten-year protection, or $492 million in 20-year present value for two payments ten years apart.

In 2004, Ecology funded extensive modeling of potential spills in Washington. Adjusted for inflation, a single large spill in Washington could result in losses of over $15 billion (2022-dollars).

For the 2.8 million households in Washington, the collective annual willingness to pay for restoring the chinook population was estimated to be $137 million (2022$), or over $1 billion in present value over ten years.

Washington's commercial fisheries have historical, cultural, and economic significance to the state. Pollution from an oil spill and resulting impacts to wildlife would have lasting negative effects on the state's fisheries, but we are unable to quantify these at this time. In 2015, Washington's commercial fishing and seafood processing industries supported nearly 16,000 jobs with combined wages of over $1 billion and revenue of $12 billion (2022$). Between 2009 and 2015, Washington exported nearly $10 billion in seafood, with the majority going to Canada, China, and Japan. Over half of Washington's counties support fisheries-related jobs with locations along the coastal, Puget Sound, and inland regions of the state.

CBA DETERMINATION

We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the rule amendments, as compared to the baseline, the benefits of the rule amendments are greater than the costs.

LEAST-BURDENSOME ALTERNATIVE

We considered alternative rule content related to the following, and did not include it in the rule amendments due to increased compliance burden and/or failure to meet the goals and objectives of the authorizing statutes:

- Physical documents.
- Ecology inspections.
- Approved standards.
- Significant change.
- Environmental conditions.
- Nonfloating oil.
- Ownership change.
- Compliance deadlines.
- Prebooming timeframe.
- Prebooming and transit conditions.
- Universal prebooming.
- Universal prebooming when safe and effective.
- Universal prebooming without worst-case resources.
- Reevaluation of weather conditions.
- Prebooming simultaneous transfers.

- Verifiable data.
- Limiting transfer locations.
- Reduced safe and effective data requirements.
- Daylight-only transfers without prebooming.
- Universal prebooming in anchorage areas without worst-case resources.
- Worst-case resources for transfers in anchorage areas.
- U.S. Coast Guard timeframe for advance notice.
- Refined product advance notice.
- Listing transfer locations.
- Unannounced drills.
- Proof of certification.
- Reduced secondary containment requirements for permeability.
- Expanded secondary containment requirements.
- Risk assessment process.
- More stringent seismic protection measures.
- Less stringent seismic protection measures.
- Out of service definition.
- Temporary decommissioning.

LBA DETERMINATION

After considering alternatives to the rule's contents, within the context of the goals and objectives of the authorizing statute, we determined that the rule represents the least-burdensome alternative of possible rule contents meeting the goals and objectives.

REGULATORY FAIRNESS ACT COMPLIANCE

We calculated the estimated costs to comply with the rule amendments, based on the 20-year present value (PV) costs estimated in Chapter 3 of this document. Based on these relative costs, we conclude that the rule amendments are likely to have disproportionate impacts on small businesses, and therefore Ecology must include elements in the rule amendments to mitigate this disproportion, as far as is legal and feasible.

Many of the likely affected businesses operate in a variety of industries. To reflect this, we ran multiple REMI model scenarios, varying assumptions about which industries incur costs, as well as the size of costs (based on ranges estimated in Chapter 3), to develop a range of estimated impacts across the state. Across 24 modeled scenarios:

- The lowest impacts resulted from low-end estimates of costs, and most costs being borne by the petroleum manufacturing industry except those costs isolated by their applicability to wholesale or water transportation industries. This resulted in statewide aggregate impacts of:
    - Output losses of $4 million in 2023, rising to $21 million by 2027, and falling thereafter.
    - No significant impact to prices.
    - 10 full-time employee (FTE) equivalents in 2023.
    - 43 FTE equivalents in 2027, falling thereafter.
- The highest impacts resulted from high-end estimates of costs, and most costs being borne by the petroleum manufacturing industry, with a higher proportion of costs that are applicable to them being borne by marinas and marine services. This resulted in statewide aggregate impacts of:
    - Output losses of $84 million in 2023, rising to $0.5 billion by 2027, and falling thereafter.
    - Small impacts on prices, up to a maximum of 0.04% in 2027.
    - 195 FTE equivalents in 2023.
    - 1,042 FTE equivalents in 2027, falling thereafter.

We note that baseline state output is forecast to be over $1.2 trillion by 2027, of which the highest impact scenario impact of $0.5 billion is approximately 0.04%. Similarly, baseline state employment is forecast to be over 5 million FTE equivalents by 2027, of which the highest impact scenario impact is approximately 0.02%.

This page intentionally left blank.

Chapter 1: Background and Introduction

1.1 Introduction

This report presents the determinations made by the Washington State Department of Ecology as required under Chapters 34.05 and 19.85 RCW, for the adopted amendments to the following rules:

- Facility Oil Handling Standards (Chapter 173-180 WAC), and
- Vessel Oil Transfer Advance Notice and Containment Requirements (Chapter 173-184 WAC).

This includes the:

- Final Cost-Benefit Analysis (CBA)
- Least-Burdensome Alternative Analysis (LBA)
- Administrative Procedure Act Determinations
- Regulatory Fairness Act Compliance

The Washington Administrative Procedure Act (APA; RCW 34.05.328(1)(d)) requires Ecology to evaluate significant legislative rules 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 law being implemented." Chapters 1 – 5 of this document describe that determination.

The APA also requires Ecology to "determine, after considering alternative versions of the rule…that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives" of the governing and authorizing statutes. Chapter 6 of this document describes that determination.

The APA also requires Ecology to make several other determinations (RCW 34.05.328(1)(a) – (c) and (f) – (h)) about the rule, including authorization, need, context, and coordination. Appendix A of this document provides the documentation for these determinations.

The Washington Regulatory Fairness Act (RFA; Chapter 19.85 RCW) requires Ecology to evaluate the relative impact of rules that impose costs on businesses in an industry. It compares the relative compliance costs for small businesses to those of the largest businesses affected. Chapter 7 documents that analysis, when applicable.

1.1.1 Background

Chapter 173-180 WAC establishes oil spill prevention and oil transfer requirements for regulated oil handling facilities. Chapter 173-184 WAC establishes oil transfer requirements for vessels delivering oil in bulk on or over waters of the state.

The rule amendments reflect updates made to the authorizing statute, Chapter 88.46 RCW. They also include necessary administrative updates, expand on existing requirements, and establish new requirements for facilities and vessels.

1.2 Summary of the rule amendments

The rule amendments make the following changes:

- Chapter 173-180 WAC – Facilities:
    - Extending timelines and contents of recordkeeping requirements.
    - Adding flexibility in transfer equipment testing standards.
    - Adding resubmission criteria and required contents to Advance Notice of Transfer (ANT) for Class 1, 2, and 3 facilities.
    - Specifying process timing for Equivalent Compliance Plan submittal and approval.
    - Removing ineffective oil transfer procedure requirements.
    - Adding seismic requirements for storage tanks.
    - Adding seismic requirements for transfer pipelines.
    - Adjusting process and requirements of Class 1 and 2 Operations Manual submittal.
    - Defining substantial change in a Class 1 facility's oil-handling capacity.
    - Clarifying required follow-up training.
    - Adjusting timing, update, and notification requirements for Class 1 and 2 Training and Certification Programs.
    - Expanding Class 1 facility Prevention Plan contents including secondary containment and risk analysis criteria and timing.
    - Expanding Class 2 facility Oil Transfer Response Plan format and content requirements.
    - Specifying drill requirements for Class 2 facilities.
    - Adding out of service and decommissioning requirements for Class 1 facilities.
- Chapter 173-184 WAC – Vessels:
    - Expanding recordkeeping and records availability requirements.
    - Adjusting timing, resubmission criteria, and contents of ANT for delivering vessels.
    - Clarifying Rate A prebooming requirements for safe and effective threshold values for locations not covered in the report and for lightering.

- Both rules:
    - Adding definitions to facilitate rule requirements.
    - Specifying Ecology enforcement actions regarding noncompliance.
    - Specifying compliance schedules for new rule requirements.
    - Removing the option to submit paper or faxed copies of reports and plans.
    - Streamlining the conditional approval process and requirements for:
        - Safe and Effective Threshold Determination Reports.
        - Equivalent Compliance Plans.
        - Class 1 facility Prevention Plans and Operations Manuals.
        - Class 2 facility Oil Transfer Response Plans and Operations Manuals.
        - Class 1 and 2 facility Training and Certification Program.
    - Expanding Rate A prebooming and alternative measures requirements:
        - Recommended consideration of additional prebooming.
        - Reporting criteria and contents of Boom Reporting Form.
        - In cases of multiple simultaneous transfers.
    - Expanding required contents of Safe and Effective Threshold Determination Report.
    - Clarification and reorganization without material impact.

1.3 Reasons for the rule amendments

Ecology amended both rules to align them with statutory changes made in the 2019 legislative session. Through Engrossed Substitute House Bill (ESHB) 1578, codified in RCW 88.46.165, the Legislature expanded advance notice of oil transfer reporting requirements for Class 1, 2, and 3 facilities and for vessels delivering oil in bulk on or over waters of the state. Expanded advance notice reporting requirements allow Ecology to better prepare for and respond to spills that may impact waters of the state.

Amendments include necessary administrative updates that provide clear direction to the regulated community and streamline process requirements. Consistent standards provide ease of compliance with Ecology's rules and ensure they are not overly burdensome.

Amendments also include broader policy changes. As oil spill risk continues to change and new risks emerge, Ecology's rules must adapt to address these risks and ensure we are requiring the necessary safeguards to prevent, prepare for, and respond to spills. These amendments are essential to address gaps identified and provide stronger oil spill protection to the waters of the state.

Expanded requirements for Class 1 facilities address gaps identified in oil spill prevention standards. Specifying criteria for reporting secondary containment permeability will allow facilities and Ecology to determine whether they are meeting existing standards. Providing criteria for facility spill risk analyses will improve the quality and consistency of risk assessments. Addressing requirements for seismic protection of storage tanks and transfer pipelines will ensure safeguards are in place to help prevent spills during seismic events. Establishing out of service and decommissioning requirements provides oil spill prevention measures during the entirety of a facility's life cycle.

Expanded Oil Transfer Response Plan requirements for Class 2 facilities provides an additional layer of oil spill preparedness, as oil transfers for these facilities occur broadly throughout the state. Routine exercise of response equipment and notification procedures strengthens the state's readiness when a spill occurs.

Facilities and delivering vessels must ensure safeguards are maintained before and during oil transfer operations. Ecology's requirements take into consideration each aspect of the transfer, minimizing the risk and impact of a spill. This includes ensuring containment measures are in place, effective communication is being practiced, and recovery equipment is readily available in case of an incident.

Rule updates are necessary for oil transfer operations to reflect lessons learned through years of implementation and provide oil spill prevention improvements in areas where gaps have been identified.

Updated advance notice reporting timeframe requirements for oil transfer information to Ecology allows inspectors time to prepare for and conduct oil transfer inspections. Oil transfer inspections provide enhanced protection to the waters of the state.

1.4 Document organization

The remainder of this document is organized in the following chapters:

- **Baseline and the rule amendments (Chapter 2):** Description and comparison of the baseline (what would occur in the absence of the rule amendments) and the rule requirements.
- **Likely costs of the rule amendments (Chapter 3):** Analysis of the types and sizes of costs we expect impacted entities to incur as a result of the rule amendments.
- **Likely benefits of the rule amendments (Chapter 4):** Analysis of the types and sizes of benefits we expect to result from the rule amendments.
- **Cost-benefit comparison and conclusions (Chapter 5):** Discussion of the complete implications of the CBA.
- **Least-Burdensome Alternative Analysis (Chapter 6):** Analysis of considered alternatives to the contents of the rule amendments.

- **Regulatory Fairness Act Compliance (Chapter 7):** When applicable. Comparison of compliance costs for small and large businesses; mitigation; impact on jobs.
- **APA Determinations (Appendix A):** RCW 34.05.328 determinations not discussed in chapters 5 and 6.

Chapter 2: Baseline and Rule Amendments

2.1 Introduction

We analyzed the impacts of the rule amendments relative to the existing rules, within the context of all existing requirements (federal and state laws and rules). This context for comparison is called the baseline and reflects the most likely regulatory circumstances entities would face if the rule amendments were not adopted. It is discussed in Section 2.2, below.

2.2 Baseline

The baseline for our analyses generally consists of existing rules and laws, and their requirements. This is what allows us to make a consistent comparison between the state of the world with and without the rule amendments.

For this rulemaking, the baseline includes:

- The authorizing statutes:
    - Chapter 88.46 RCW – Vessel Oil Spill Prevention and Response
    - Chapter 90.56 RCW – Oil and Hazardous Substance Spill Prevention and Response
- The existing rules:
    - Chapter 173-180 WAC – Facility Oil Handling Standards
    - Chapter 173-184 WAC – Vessel Oil Transfer Advance Notice and Containment Requirements
- Other relevant rules, including but not limited to:
    - Chapter 51-50 WAC – State Building Code Adoption and Amendment of the 2021 Edition of the International Building Code
    - Chapter 173-182 WAC – Oil Spill Contingency Plan
    - Chapter 173-185 WAC – Oil Movement by Rail and Pipeline Notification
    - Chapter 317-40 WAC – Bunkering Operations
- Relevant federal requirements, including but not limited to:
    - 29 C.F.R. Part 1910 – Occupational Safety and Health Standards
    - 33 C.F.R. Part 154 – Facilities Transferring Oil or Hazardous Material in Bulk
    - 33 C.F.R. Part 155 – Oil or Hazardous Material Pollution Prevention Regulations for Vessels
    - 33 C.F.R. Part 156 – Oil and Hazardous Material Transfer Operations
    - 40 C.F.R. Part 112 – Oil Pollution Prevention

    - 40 C.F.R. Part 302 – Designation, Reportable Quantities, and Notification
    - 46 C.F.R. Part 69 – Measurement of Vessels
    - 49 C.F.R. Part 130 – Oil Spill Prevention and Response Plans
    - 49 C.F.R. Part 195 – Transportation of Hazardous Liquids by Pipeline
- Other relevant codes, including but not limited to:
    - International Building Code, Chapter 16 (adopted by Chapter 51-50 WAC)
    - International Fire Code, Chapter 57
    - National Fire Protection Association, Flammable and Combustible Code, No. 30
- National Preparedness for Response Exercise Program

2.3 Rule amendments

The rule amendments make the following changes:

- Chapter 173-180 WAC – Facilities:
    - Extending timelines and contents of recordkeeping requirements.
    - Adding flexibility in transfer equipment testing standards.
    - Adding resubmission criteria and required contents to Advance Notice of Transfer (ANT) for Class 1, 2, and 3 facilities.
    - Specifying process timing for Equivalent Compliance Plan submittal and approval.
    - Removing ineffective oil transfer procedure requirements.
    - Adding seismic requirements for storage tanks.
    - Adding seismic requirements for transfer pipelines.
    - Adjusting process and requirements of Class 1 and 2 Operations Manual submittal.
    - Defining substantial change in a Class 1 facility's oil-handling capacity.
    - Clarifying required follow-up training.
    - Adjusting timing, update, and notification requirements for Class 1 and 2 Training and Certification Programs.
    - Expanding Class 1 facility Prevention Plan contents including secondary containment and risk analysis criteria and timing.
    - Expanding Class 2 facility Oil Transfer Response Plan format and content requirements.
    - Specifying drill requirements for Class 2 facilities.

    - Adding out of service and decommissioning requirements for Class 1 facilities.
- Chapter 173-184 WAC – Vessels:
    - Expanding recordkeeping and records availability requirements.
    - Adjusting timing, resubmission criteria, and contents of ANT for delivering vessels.
    - Clarifying Rate A prebooming requirements for safe and effective threshold values for locations not covered in the report and for lightering.
- Both rules:
    - Adding definitions to facilitate rule requirements.
    - Specifying Ecology enforcement actions regarding noncompliance.
    - Specifying compliance schedules for new rule requirements.
    - Removing the option to submit paper or faxed copies of reports and plans.
    - Streamlining the conditional approval process and requirements for:
        - Safe and Effective Threshold Determination Reports.
        - Equivalent Compliance Plans.
        - Class 1 facility Prevention Plans and Operations Manuals.
        - Class 2 facility Oil Transfer Response Plans and Operations Manuals.
        - Class 1 and 2 facility Training and Certification Program.
    - Expanding Rate A prebooming and alternative measures requirements:
        - Recommended consideration of additional prebooming.
        - Reporting criteria and contents of Boom Reporting Form.
        - In cases of multiple simultaneous transfers.
    - Expanding required contents of Safe and Effective Threshold Determination Report.
    - Clarification and reorganization without material impact.

2.3.1 Chapter 173-180 WAC (Facilities)

2.3.1.1 Recordkeeping

Baseline

The baseline rule includes requirements for recordkeeping and sets a requirement to keep most records for three years. It specifies records that must be kept for other durations, including but not limited to equipment lifetime for design, construction, and repair records, and five years for training and certification records.

Adopted

The rule:

- Expands the types of equipment records facilities must keep for the lifetime of the equipment, to include certain inspection and testing records.
- Adds a five-year retention requirement for inspection, maintenance, and repair records for secondary containment.
- Adds a requirement for Class 4 facilities to keep oil transfer personnel training records for five years.

Expected impact

We expect the rule to generate minor administrative recordkeeping costs. It also provides clear and comprehensive information about equipment, secondary containment, and Class 4 facility training records. Having this information available on a consistent basis will help us understand facility compliance and potential causes of failure.

2.3.1.2 Transfer equipment testing standards

Baseline

Under the baseline, under WAC 173-180-205, testing of oil transfer equipment must be completed annually using one of a set of specified methods.

Adopted

The rule adds the option of using another method of equal or higher standards than those listed under the baseline. This method needs to be approved by Ecology.

Expected impact

If a facility chooses to propose an alternative testing method, and we approve that method, we expect the rule to reduce compliance costs without reducing the effectiveness of transfer equipment testing.

2.3.1.3 Advance Notice of Transfer

Baseline

Class 1, 2, and 3 facilities transferring more than 100 gallons of oil must notify Ecology at least 24 hours before the transfer (or, if 24 hours is not possible, as soon as is possible before the transfer), using the Advance Notice of Transfer (ANT) form.

Chapter 88.46 RCW additionally specifies the following must be included in the ANT:

- Region.
- Gravity as measured by American Petroleum Institute (API) standard.
- Type of crude oil.

Chapter 173-185 WAC requires API gravity and sulfur content.

Adopted

The rule:

- Adds a requirement to resubmit the ANT if the start time of the transfer changes by more than six hours.
- Removes the option to submit an ANT by fax.
- Adds the following information to the contents of the ANT:
    - Specifying the name of the delivering facility and receiving vessel must be the documented name.
    - Details of oil product type if it is crude oil:
        - Region of origin.
        - Gravity as measured by API standard, or specific gravity.
        - Sulfur content.
        - Viscosity.

Expected impact

For transfers with a change in timing greater than six hours, the rule will result in costs associated with resubmission of the updated ANT. This will also result in the benefit of timely and accurate information about the transfer.

The additional information reported in the ANT brings these requirements into consistency with statutory baseline requirements and similar requirements in other rules. Ecology used discretion in including specific gravity, sulfur content, and viscosity. The rule is likely to generate administrative costs above the baseline, associated with reporting this additional known information. It will also generate a benefit of comprehensive and consistent reporting requirements and information about the transfer. We note that currently all but one company submits this information electronically.

2.3.1.4 Equivalent Compliance Plan

Baseline

Under the baseline, owners or operators must submit a paper and electronic copy of their Equivalent Compliance Plan to Ecology. The baseline rule also specifies submittal and approval process requirements, as well as conditional approval.

Adopted

The rule removes the requirement to submit a paper copy and only require owners and operators to submit one electronic copy of the plan to Ecology. It also clarifies (without material impact, see section 2.3.3.8 below) the submittal and approval process, and elements of conditional approval. Finally, it adds specification of potential restrictions under conditional approval, as well as timing of the conditional approval requirements.

Expected impact

The rule amendments will result in potential cost-savings associated with electronic submission of the plan, as compared to submitting both a physical and electronic plan. (See section 2.3.3.4 below.)

The guidance for conditional approval will increase compliance costs if restrictions result in the need to comply with the rule without an Equivalent Compliance Plan, as the plan is a means of achieving the goals and standards of the rule using alternative means. These amendments retain the spill-related environmental, public health, and property protections of the rule in the event a plan is conditionally approved. (See section 2.3.3.5 below.)

2.3.1.5 Oil transfer procedure

Baseline

Under the baseline, all oil transfer operations must be performed based on the facility's approved Operations Manual. Among the requirements for oil transfer procedures:

- Deliveries providing oil to vessels without fixed containment must use back pressure shutoff nozzles and provide sufficient portable containment for each tank vent.
- The Persons in Charge (PICs) must verify that designated tanks are receiving oil at the expected rate.

Adopted

Under the rule, deliveries providing oil to vessels without fixed containment will no longer be required to use back pressure shutoff nozzles, as this requirement is unfeasible for most vessels, and backpressure shutoff nozzles are ineffective for most vessels. The amendments also clarify that the facility and vessel PICs should also verify that the designated tanks are receiving or discharging oil at the expected rate, and that no other tanks are receiving or discharging oil.

Expected impact

We expect these amendments to result in:

- Potential cost-savings associated with eliminating the shutoff nozzle requirement, without impacting the effectiveness of the rule.
- Potential labor costs associated with PICs time to make required verifications if the current rule was not consistently interpreted as already requiring the newly specified verifications. As this may be considered a clarification, it would not generate costs or benefits in those cases. For facilities and vessels whose PICs did not interpret the baseline language to apply also to discharging tanks and other tanks, the amendments will result in additional labor costs, as well as benefits of identifying or reducing risk of conditions that may result in a spill.

2.3.1.6 Seismic requirements – storage tanks

Baseline

The baseline sets out requirements for storage tanks, including fire protection codes, and design and manufacturing standards.

Adopted

The rule adds seismic protection requirements for storage tanks at Class 1 facilities. It requires tanks installed before the effective date of the rule to install and maintain one or more of the following:

- Flexible mechanical device(s) between storage tank and piping or sufficient piping flexibility to protect the storage tank and pipe connection and prevent the release of product.
- Foundation driven pilings.
- Anchored storage tanks.
- Another equally protective measure approved by Ecology.

It also requires newly constructed tanks to meet baseline building and fire code requirements as well as specific design and manufacturing standards. These new tanks also need to be designed to meet specific seismic design and inspection requirements from the:

- API, including API Standard 650 – Welded Steel Tanks for Oil Storage.
- American Society of Civil Engineers.
- International Building Code and Washington Building Code adopting it.

Expected impact

The rule is likely to result in costs associated with installation, design, permitting, construction, and maintenance of additional seismic protection measures at existing tanks or with seismic standards for new tanks. These improved protections will likely reduce spills in the event of seismic activity, taking into account site-specific attributes such as soil properties and tsunami risk. This, in turn, reduces the risk of impacts to the environment, public health, and property that result from spills and earthquakes.

2.3.1.7 Seismic requirements – transfer pipelines

Baseline

The baseline sets out requirements for transfer pipelines, including federal codes, access restrictions, inspection requirements, and requirements for buried pipelines.

Adopted

The rule adds seismic protection requirements for transfer pipelines at Class 1 facilities. It requires pipelines installed before the effective date of the rule to install and maintain one or more of the following:

- Flexible mechanical device(s) between storage tank and piping or sufficient piping flexibility to protect the storage tank and pipe connections.
- Flexible mechanical device(s) or adequate pipeline flexibility between pipes.
- Pipeline supports that protect against seismic motion.
- Automatic isolation shutoff valves triggered by seismic events.
- Another equally protective measure approved by Ecology.

The rule also specifies the relevant baseline requirements (federal codes) for pipelines that are replaced, moved, or constructed after the effective date of the rule. It adds seismic protection design standards and includes requirements for one or more of the protection measures listed above.

Expected impact

The rule is likely to result in costs associated with installation, design, permitting, construction, and maintenance of additional seismic protection measures at existing transfer pipelines or with seismic standards for new or changed pipelines. These improved protections will likely reduce spills in the event of seismic activity. This, in turn, reduces the risk of impacts to the environment, public health, and property that result from spills and earthquakes.

2.3.1.8 Operations Manual submittal

Baseline

Under the baseline, Class 1 facilities must submit their Operations Manual to Ecology, for re-approval, 120 days before beginning oil transfer operations. Class 2 facilities must submit manuals for initial approval 90 days before conducting oil transfers, and 180 days before for re-approval.

Adopted

The rule requires Class 1 and 2 facilities to submit all Operations Manuals (initial approval and re-approval) to Ecology 120 days before oil transfer operations.

It also removes the option to submit a physical manual.

Expected impact

The rule will result in minor time-related benefits or costs related to later or earlier submittal requirements. These amendments also result in the benefit of consistency across operations manual submittal requirements across Class 1 and 2 facilities, and across manuals submitted for initial approval and re-approval.

The rule will result in potential cost-savings associated with only having to submit an electronic copy of the manual, as compared to submitting a physical and electronic manual. (See section 2.3.3.4 below.)

2.3.1.9 Substantial change in operations

Baseline

Under the baseline, Class 1 and 2 facilities must notify Ecology before any significant change. The baseline rule lists examples of significant change, including but not limited to:

- Change in type of oil handled.
- Substantial change in oil handling capacity.
- Noncompliance with the Federal Oil Pollution Act of 1990.
- Substantial change in spill prevention technology, or facility technology, operations, or personnel procedures.

Adopted

The rule classifies failure to notify Ecology of a significant change as noncompliance.

It also defines a substantial change in oil handling capacity as at least 5% for Class 1 facilities.

Expected impact

Defining a substantial change in oil handling capacity provides clarity and consistency for this requirement, as it aligns this requirement with existing Prevention Plan requirements. This reduces overcompliance related to broader interpretation of substantial change, as well as reducing undercompliance related to a more limited interpretation of substantial change that results in failure to notify Ecology and update the manual. Depending on how facilities interpret the baseline requirements, this could result in increases or decreases of costs associated with notification and operations manual updates.

2.3.1.10 Follow-up training

Baseline

Under the baseline, Class 1 and 2 facilities must develop follow-up remedial training for personnel clearly responsible for causing an oil spill while functioning in their position, unless they no longer occupy that position.

Adopted

The rule eliminates the use of “remedial” and “clearly” while adding clarity that the training must address the causes of the spill and measures to prevent it happening again, as part of the continuing education program for Class 1 facilities.

Expected impact

These amendments would result in no costs of including additional specifics in the training, as all Class 1 facilities are doing this in practice. They are not likely to generate benefits, as again, this is done in practice and clarity was added to the language for consistency with Class 2 follow-up training requirements.

2.3.1.11 Training and Certification Program

Baseline

Under the baseline, Class 1 and 2 facilities must develop and implement their Training and Certification Program at least 90 days prior to oil transfer operations.

Adopted

The rule amendments require earlier implementation of 120 days before oil transfer operations. The amendments also specify how significant changes to the Training and Certification Program should be documented or identified.

Amendments to this section also include clarifications without material change to requirements (see section 2.3.3.8 below).

Expected impact

These amendments will result in minor timing-related costs associated with earlier implementation of training and certification programs but would generate benefits of allowing additional time for Ecology to work with a facility to ensure any necessary changes are made to their program before beginning oil transfer operations.

If a significant change does occur at a facility, costs may be increased or decreased depending on the facility's interpretation of existing requirements versus the updated clarity added. However, costs will most likely be reduced as it is now clear exactly when Prevention Plans should be updated to reflect changes to the Class 1 facility's Training and Certification Program, or changes identified to Ecology for Class 2 facilities. This would generate benefits of ensuring Prevention Plans are updated after significant changes occur at Class 1 facilities and changes at Class 2 facilities are identified to Ecology staff during on-site evaluations.

2.3.1.12 Prevention Plan

Baseline

The baseline rule specifies requirements for Class 1 facility Prevention Plans, including formatting, contents, and submittal. Contents include facility information and baseline secondary containment requirements, and requirements for spill risk analysis. Submittal is required 65 days before beginning operations or plan expiration.

Adopted

The rule:

- Adds name and contact information of the facility's supervising, management, and operations personnel.
- Specifies Prevention Plan details regarding secondary containment permeability.
- Formally defines specific elements of the baseline risk analysis requirement.
- Requires plan submittal 120 days before the expiration date of the existing plan and before beginning operations.

The rule also removes the baseline requirement option for submittal of a paper copy of the Prevention Plan to only an electronic submittal requirement (see section 2.3.3.4 below).

Expected impact

These amendments will result in costs associated with:

- Providing additional information regarding personnel and contact information.
- Potential additional analysis and documentation of secondary containment permeability, depending on interpretation of baseline requirements.
- Potential additional risk analysis, depending on interpretation of baseline requirements.
- Submitting the plan earlier than under the baseline.

The amendments will also result in benefits associated with:

- Having ready and predictable access to personnel contact information.
- Potential improved or more accurately documented understanding of secondary containment permeability, depending on interpretation of baseline requirements.
- Potential improved or more accurately documented understanding of spill risk and associated prevention and preparedness needs, depending on interpretation of baseline requirements.
- Additional time to work with Ecology to ensure Prevention Plans are sufficient, before plan expiration or beginning operations, to avoid restrictions or delays affecting operations.

2.3.1.13 Oil Transfer Response Plan

Baseline

The baseline rule specifies requirements Class 2 facility Oil Transfer Response Plans (OTRPs), including formatting, contents, and submittal. Contents includes the requirements of 33 C.F.R Part 154. Submittal of two physical copies and one electronic copy of the plan is required.

Adopted

The rule amendments list the specific requirements of the baseline federal requirements, and include adding the following additions to the OTRP:

- Cross-reference table.
- Written statement binding the plan submitter to its use.
- Description of the number of tanks on the largest truck or container.
- For baseline transfer location listing:
    - Clarified facility location description, of street address or GPS location.
    - Prior notification to Ecology of locations not listed in the plan.
    - Transfer rates used at each listed facility.

- Written statement that drill records will be kept for three years and made available to Ecology.

The rule also removes the baseline requirement for submittal of paper copies of the OTRP to only an electronic submittal requirement (see section 2.3.3.4 below).

Expected impact

Under the rule amendments, Class 2 facilities are likely to incur the following costs:

- Minor formatting, binding written statement, container description, and transfer location listing costs.
- Notification costs.
- Minor recordkeeping and records access costs.

The amendments are likely to result in benefits of:

- Improved usability related to OTRP formatting.
- Clear commitment to use of the OTRP and providing access to drill records.
- Clear information about tanks and transfer rates.
- Minor cost to describe facility locations.
- Ecology awareness of, and consistent approach to, transfers at facilities not listed in the OTRP.

2.3.1.14 Drill requirements

Baseline

The baseline includes drill requirements for Class 2 facilities, based in the National Preparedness for Response Exercise Program (NPREP) Guidelines.

Adopted

The rule amendments:

- Add drill credit for a spill.
- Specify requirements of tabletop and deployment drills to be designed with Ecology.

Expected impact

Under these amendments, Class 2 facilities will incur costs of planning drills with Ecology and their company planner. These amendments will result in benefits of more effective drills and their intended improvements to response in the event of a spill. Class 2 facilities receiving drill credit for responding to a spill will also see a cost-savings of the avoided additional drill.

2.3.1.15 Out of service requirements

Baseline

The baseline does not include Washington State-specific out of service requirements for storage tanks and transfer pipelines at Class 1 facilities. Storage tanks and transfer pipelines may be placed in caretaker status under 33 C.F.R. Part 154 or permanently closed as defined in 40 C.F.R. Part 112.

Adopted

The rule requires owners or operators of out of service storage tanks or transfer pipelines to meet the following:

- If not decommissioning the equipment, continue to comply with rule requirements for active equipment.
- If decommissioning the equipment:
    - Transfer pipelines must be oil-free, certified gas-free, and blanked at both ends.
    - Marine transfer hoses must be oil-free, certified gas-free, and removed from the dock.
    - Storage tanks must be oil-free, certified gas-free, and disconnected.
        - Piping connections must be blanked.
        - Connected piping must be air-gapped.
        - Electrical devices must be de-energized.

The owner or operator also needs to notify Ecology 30 days before a decommissioning or return to service.

Expected impact

The rule will likely result in costs of either continuing to maintain storage tanks and transfer pipelines as though they were in use, or costs of decommissioning and notification. Facilities would choose the least-cost option, accounting for relative costs and tradeoffs of the options available to them.

These requirements will generate benefits of reduced spill risk associated with equipment that is out of use and may not be appropriately maintained. While there are current voluntary options available under the baseline, they are not mandatory or comprehensive.

2.3.2 Chapter 173-184 WAC (Vessels)

2.3.2.1 Recordkeeping

Baseline

The baseline rule does not include recordkeeping requirements.

Adopted

The rule sets three-year records retention requirements and requires records to be made available to Ecology upon request.

Expected impact

We expect the rule to generate minor administrative recordkeeping costs, as well as clear and comprehensive records supporting vessel oil transfer notice and containment.

2.3.2.2 Advance Notice of Transfer

Baseline

The baseline rule sets Advance Notice of Transfer (ANT) requirements for delivering vessels, including timing, format, and contents. ANT submission is required at least 4 hours before transfer, and a fax or by Ecology form is required.

Chapter 88.46 RCW additionally specifies that the following must be included in the ANT:

- Region.
- Gravity as measured by American Petroleum Institute (API) standard.
- Type of crude oil.

Chapter 173-185 WAC requires API gravity and sulfur content.

Adopted

The rule:

- Adds a requirement to resubmit the ANT if the start time of the transfer changes by more than six hours.
- Requires ANT submission at least 24 hours in advance or the timeframe set forth by the applicable U.S. Coast Guard Captain of the Port, whichever is greater.
- Removes the option to submit an ANT by fax.
- Adds the following information to the contents of the ANT:
    - Specifying the name of the delivering vessel and receiving vessel or facility must be the documented name.
    - Details of oil product type if it is crude oil:
        - Region of origin.
        - Gravity as measured by API standard, or specific gravity.
        - Sulfur content.
        - Viscosity.

Expected impact

For transfers with a change in timing greater than six hours, the rule will result in costs associated with resubmission of the updated ANT. This will also result in the benefit of timely and accurate information about the transfer.

The additional information reported in the ANT will bring these requirements into consistency with statutory baseline requirements and similar requirements in other rules. Ecology used discretion in including specific gravity, sulfur content, and viscosity. The rule is likely to generate administrative costs above the baseline, associated with reporting this additional known information. It also generates a benefit of comprehensive and consistent reporting requirements and information about the transfer. We note that currently all but one company submits this information electronically.

2.3.2.3 Prebooming requirements

Baseline

Under the baseline, Rate A deliverers must preboom transfers when it is safe and effective to do so and identifies determination of safe and effective.

Adopted

The rule requires that:

- Vessels use threshold values specified in rule for locations that are not covered in the Safe and Effective Threshold Determination Report.
- Vessels to use threshold values specified in the rule for lightering transfers.

Expected impact

The rule will generate benefits of facilitating safe and effective prebooming of transfers in cases for which the Safe and Effective Threshold Determination Report does not contain the relevant thresholds.

2.3.3 Both rules (Facilities and vessels)

2.3.3.1 Definitions

Baseline

The baseline rule and statute contain definitions relevant to the baseline rule requirements.

Adopted

The rule amendments:

- Add definitions from the baseline statute.
- Add definitions needed to implement new requirements.

Expected impact

Definitions do not have an impact in and of themselves but may impact costs and/or benefits where they are used in rule requirements. Relevant costs and benefits are discussed in the sections in which each requirement is discussed.

2.3.3.2 Noncompliance

Baseline

Under the baseline, facilities and vessels that violate relevant chapters may be subject to enforcement and penalties under the authorizing statute.

Adopted

The rule amendments add that in response to noncompliance with any requirement, Ecology may conditionally approve or disapprove any approved plan, manual, program, or report.

Expected impact

These amendments are intended to facilitate use of corrective actions other than enforcement and penalties. By including conditional approval, compared to the baseline, they reduce potential costs and disruption associated with noncompliance, while maintaining the rule's protections for the environment, public health, and property.

2.3.3.3 Compliance schedules

Baseline

The baseline inherently does not include compliance deadlines for new rule requirements, beyond any added to the rule in a previous rulemaking.

Adopted

The rule amendments include compliance schedules for existing facilities and vessels:

- 30 days from rule effective date to meet ANT requirements for delivering facilities and vessels.
- 60 days from rule effective date to meet Rate A prebooming requirements for delivering facilities and vessels conducting Rate A transfers.
- By the current Safe and Effective Threshold Determination Report's expiration date after rule effective date, delivering facilities and vessels conducting Rate A transfers to meet associated requirements.
- Within 10 years from rule effective date or by the next scheduled internal API Standard 653 inspection, whichever is later, for Class 1 facility storage tanks constructed before the effective date to meet seismic protection measures.
- Within 10 years from rule effective date or by the next scheduled API Standard 570 inspection, whichever is later, for Class 1 facility transfer pipelines constructed before the effective date to meet seismic protection measures.

- By the current Operations Manual's expiration date after rule effective date, for Class 1 and 2 facilities to meet manual requirements.
- By the current Training and Certification Program's expiration date after rule effective date, for Class 1 and 2 facilities to meet program requirements.
- By the current Prevention Plan's expiration date after rule effective date, for Class 1 facilities to meet associated requirements.
- 12 months after rule effective date to meet Oil Transfer Response Plan requirements for Class 2 facilities.
- Drill program requirements begin after Oil Transfer Response Plan requirements are met for Class 2 facilities.

They also include requirements for new facilities and vessels, and new owners or operators, to meet the new requirements before beginning operations.

Expected impact

The adopted compliance schedules allow entities time to come into compliance with new rule requirements. This results in a timing-related cost-savings by delaying compliance costs and allowing for more planning time.

2.3.3.4 Electronic submission

Baseline

Under the baseline, requirements for reports and plans include submission of physical copies by mail or submission by fax, as well as occasional electronic submission.

Adopted

The amendments throughout the rule make all records submittable electronically, through an online format or using email. Submitting via fax or a paper copy is no longer an option.

Expected impact

These amendments will result in reduced costs of notification and plan submittal.

2.3.3.5 Conditional approval

Baseline

The baseline includes conditional approval for all plans, reports, manuals, and programs.

Adopted

The rule amendments establish a clear and consistent process and set of requirements for conditional approval.

Expected impact

Compared to the baseline, conditional approval as clearly defined under the rule provides additional guidance in cases where the relevant plans do not initially meet requirements for approval. This reduces the potential costs and business disruption of plan disapproval or

noncompliance resulting in enforcement or penalties. The amended rule identifies potential conditions (requirements) that would need to be met under conditional approval, which align with meeting the requirements of the rules themselves while correcting plans.

2.3.3.6 Rate A prebooming and alternative measures

Baseline

Under the baseline, Rate A deliverers must preboom transfers when it is safe and effective to do so and identifies determination of safe and effective.

Adopted

The rule amendments require:

- Boom Reporting Forms to include all observed and forecasted conditions that exceed values in the Safe and Effective Threshold Determination Report.
- Rate A deliverers transferring at anchor to submit follow-up Boom Reporting Forms every four hours if environmental conditions continue to exceed safe and effective values.
- During simultaneous or multiple transfers, it is appropriate to preboom if it is safe and effective, pumping is complete for other volatile products, and at least three hours remain in the transfer.
- Rate A deliverers transferring at a terminal to submit follow-up Boom Reporting Forms every six hours if environmental conditions continue to exceed safe and effective values.

Expected impact

The rule amendments will result in additional reporting costs, involving administrative and data gathering labor. They will also result in benefits of consistent and evidence-supported booming of Rate A transfers whenever it is safe and effective to do so, with documentation of cases in which it is not.

2.3.3.7 Safe and Effective Threshold Determination Report

Baseline

Under the baseline, delivering facilities and vessels conducting Rate A transfers must prepare a Safe and Effective Threshold Determination Report. The baseline rule includes required format, contents, submittal, and approval.

Adopted

The rule amendments add specific elements required to be included in the report, including pertaining to:

- Transfer attributes.
- Threshold value analysis.
- Boom attributes.

- Deliverer abilities.
- Determination methodology.
- Monitoring equipment.
- Determination under special circumstances.
- Reevaluation of determination.
- How alternative measures will be met.

Expected impact

These amendments will result in costs associated with the additional effort required to add newly specified elements to the report. Compliance with these requirements will result in benefits of clear methodology and planning regarding threshold values, boom attributes, deliverer abilities, determination basis, monitoring equipment, prebooming in cases where it is less effective, and alternative measures.

The rule amendments will result in potential cost-savings associated with only an electronic submission of the report, as compared to submitting a physical and electronic copy. (See section 2.3.3.4 above.)

2.3.3.8 Changes without material impact

Baseline

Experience with implementing the baseline rules and associated statutes has helped Ecology identify areas in which the organization and clarity of the rule can be improved. Ecology reduced complexity and redundancy throughout both rules.

Adopted

The rule amendments make multiple changes that have no material impact on rule requirements. These include:

- Clarifying language.
- Updating codes and standards.
- Combining sections pertaining to the same subject matter.
- Combining sections pertaining to the same entities.
- Correcting typographical, formatting, or other errors that do not affect the rule's contents.

Expected impact

These amendments do not impact rule requirements and are expected to result in neither costs nor benefits, beyond the benefit of facilitating compliance through clarity and structure.

Chapter 3: Likely Costs of the Rule Amendments

3.1 Introduction

We analyzed the likely costs associated with the rule amendments, as compared to the baseline. The rule amendments and the baseline are discussed in detail in Chapter 2 of this document.

3.2 Cost analysis

The rule amendments make the following changes:

- Chapter 173-180 WAC – Facilities:
    - Extending timelines and contents of recordkeeping requirements.
    - Adding flexibility in transfer equipment testing standards.
    - Adding resubmission criteria and required contents to Advance Notice of Transfer (ANT) for Class 1, 2, and 3 facilities.
    - Specifying process timing for Equivalent Compliance Plan submittal and approval.
    - Removing ineffective oil transfer procedure requirements.
    - Adding seismic requirements for storage tanks.
    - Adding seismic requirements for transfer pipelines.
    - Adjusting process and requirements of Class 1 and 2 Operations Manual submittal.
    - Defining substantial change in a Class 1 facility's oil-handling capacity.
    - Clarifying required follow-up training.
    - Adjusting timing, update, and notification requirements for Class 1 and 2 Training and Certification Programs.
    - Expanding Class 1 facility Prevention Plan contents including secondary containment and risk analysis criteria and timing.
    - Expanding Class 2 facility Oil Transfer Response Plan format and content requirements.
    - Specifying drill requirements for Class 2 facilities.
    - Adding out of service and decommissioning requirements for Class 1 facilities.
- Chapter 173-184 WAC – Vessels:
    - Expanding recordkeeping and records availability requirements.

- Adjusting timing, resubmission criteria, and contents of ANT for delivering vessels.
- Clarifying Rate A prebooming requirements for safe and effective threshold values for locations not covered in the report and for lightering.

- Both rules:
  - Adding definitions to facilitate rule requirements.
  - Specifying Ecology enforcement actions regarding noncompliance.
  - Specifying compliance schedules for new rule requirements.
  - Removing the option to submit paper or faxed copies of reports and plans.
  - Streamlining the conditional approval process and requirements for:
    - Safe and Effective Threshold Determination Reports.
    - Equivalent Compliance Plans.
    - Class 1 facility Prevention Plans and Operations Manuals.
    - Class 2 facility Oil Transfer Response Plans and Operations Manuals.
    - Class 1 and 2 facility Training and Certification Program.
  - Expanding Rate A prebooming and alternative measures requirements:
    - Recommended consideration of additional prebooming.
    - Reporting criteria and contents of Boom Reporting Form.
    - In cases of multiple simultaneous transfers.
  - Expanding required contents of Safe and Effective Threshold Determination Report.
  - Clarification and reorganization without material impact.

3.2.1 Chapter 173-180 WAC (Facilities)

3.2.1.1 Recordkeeping

We expect these rule amendments to generate minor administrative recordkeeping costs. We estimated costs for Class 1, 2, 3, and 4 facilities:[3]

Table 3: Number of facilities by class

Facility Class	Number of Facilities
Class 1	**23**

[3] Estimates in this document reflect up-to-date numbers of facilities by class, based on facility changes and closures since publication of the Preliminary Regulatory Analyses for this rulemaking.

Facility Class	Number of Facilities
Class 2	**22**
Class 3	**5**
Class 4	**75**
All class 1 – 4	**125**

We assumed the rule amendments will result in an additional hour every three months, spent ensuring records are being retained as required. Using the median hourly wage for "Information and records clerks, all other" of $23.58 per hour (2022-dollars)[4,5], this would result in a statewide annual cost of $11,792.

Ecology estimates costs and benefits of rulemakings in 20-year present values. A present value converts streams of future costs and benefits into a current total value that reflects both inflation and the opportunity cost of having funds later instead of now. Future values are discounted using a real (inflation-adjusted) discount rate of 0.89%.[6]

The 20-year present value of this cost estimate is approximately $215,000.

3.2.1.2 Transfer equipment testing standards

We do not expect costs associated with these rule amendments, as compared to the baseline.

3.2.1.3 Advance Notice of Transfer

Due to data attributes, this section reflects costs for facilities and vessels.

For transfers with a change in timing greater than six hours, the rule amendments will result in costs associated with resubmission of the updated ANT.

We assumed the rule amendments would result in a share of ANTs being resubmitted. As we could not identify precisely what this share would be, we estimated between 5% and 25% would be resubmitted due to a time change of greater than six hours. There are currently over 12,200 ANTs submitted each year, on average.[7] We assumed the amendments would result in 0.25 hours per resubmitted ANT. Using the median hourly wage for "Petroleum Pump System Operators, Refinery Operators, and Gaugers" of $51.81 (2022-dollars) [8,9], this would result in a statewide annual cost of between $8,000 and $40,000.

The 20-year present value of this cost estimate is approximately $145,000 to $725,000.

---

[4] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm

[5] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

[6] US Treasury Department, 2022. I bonds interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.

[7] WA Department of Ecology, 2022. Advance Notice of Transfer. Number of submissions per year 2018 – present.

[8] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm

[9] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

The additional information reported in the ANT brings these requirements into consistency with statutory baseline requirements and similar requirements in other rules. Ecology used discretion in including specific gravity, sulfur content, and viscosity. The rule is likely to generate administrative costs above the baseline, associated with reporting this additional known information using an electronic format.

We assumed the rule amendments would result in ten additional minutes (0.167 hours) of additional effort to complete the crude oil information required for an ANT, for an annual average of 263.2 crude oil ANTs. Using the median hourly wage for "Petroleum Pump System Operators, Refinery Operators, and Gaugers" of $51.81 (2022-dollars) [10,11], this would result in a statewide annual cost of $2,273.

The 20-year present value of this cost estimate is approximately $41,000.

3.2.1.4 Equivalent Compliance Plan

We do not expect costs associated with these rule amendments, as compared to the baseline, beyond those associated with streamlining the conditional approval process (see section 3.2.3.5 for conditional approval cost discussion).

3.2.1.5 Oil transfer procedure

We expect these amendments to result in potential labor costs associated with PIC time to make required verifications if the current rule was not consistently interpreted as already requiring the newly specified verifications. As this may be considered a clarification for oil transfers at some facilities, it would not generate costs in those cases. For facilities and their receiving vessels whose PICs did not interpret the baseline language to apply also to discharging tanks and other tanks, the amendments would result in additional labor costs.

We assumed the rule amendments would result in an additional 0.1 hour per ANT to make additional verifications. On average, there are currently 2,400 ANTs submitted each year this clarification may apply to.[12] Using the median hourly wage for "Petroleum Pump System Operators, Refinery Operators, and Gaugers" of $51.81 (2022-dollars) [13,14], this would result in an annual cost of $12,400.

The 20-year present value of this cost estimate is approximately $227,000.

3.2.1.6 Seismic requirements – storage tanks

[10] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[11] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[12] This is likely a conservative overestimate, as the estimate of 2,400 covered vessel fuelings per year includes all passenger and ferry vessel types. WA Department of Ecology, 2022. Advance Notice of Transfer, number of submissions from likely covered vessels.
[13] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[14] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

The rule is likely to result in costs associated with installation, design, permitting, construction, and maintenance of additional seismic protection measures at existing tanks or with seismic standards for new tanks.

For the 23 Class 1 facilities, we identified the number, size, and contents of tanks based on Ecology records for each facility. We then estimated costs using standardized cost estimates for facility construction activities[15] for each facility's potential needs for:

- Materials
- Engineering
- Overhead
- Construction management
- Additional contingency

We estimated these costs for potential installation of the options for seismic protections for tanks, accounting for tanks that already use any of the options:

- Flexible mechanical devices
- Footing anchors
- Pile foundations

Costs estimates per facility varied, as summarized below.

Table 4: Seismic protection costs, storage tanks

Statistic	Flexible Mechanical Devices	Footing Anchor	Pile Foundation
Minimum*	**$44,285**	**$0**	**$0**
Median	**$211,538**	**$1,340,680**	**$6,479,776**
Maximum	**$1,351,610**	**$8,709,317**	**$111,828,292**
Total for 23 facilities	**$8,659,766**	**$52,810,327**	**$474,497,083**

* Zero reflects cases in which one or more facilities have already installed this type of seismic protection.

These costs will be incurred once, but the timing would be left to the facilities themselves within the compliance timeframe limit of 10 years or greater based on the facility's internal API Standard 653 inspection. Based on the compliance schedules in the rule amendments, we made a centrally conservative assumption that engineering and overhead costs would be incurred immediately (though this would likely happen later), while materials, construction management, and additional contingency (for example due to extended timetables) would be incurred in year 5.

[15] Lane, T and C Babbitt, 2016. Commercial renovation costs 2017: With RSMeans data. Gordian RSMeans Data, 2016; Phelan, M, 2016. Assemblies cost with RSMeans data 2017. R S Means Co; Plotner, SC, C Babbitt, AC Charest, C Elsmore, and J Gomes, 2016. Building construction costs with RSMeans Data 2017. R S Means Co; Communications with individual companies providing seismic protection technologies.

The 20-year present values of these costs are summarized below, based on costs estimated specific to each facility's attributes. While we might assume facilities will choose the least-cost compliance option, we acknowledge they will consider these costs in conjunction with facility and property attributes related to seismic risk, other facility needs, and business needs, and will choose seismic protections accordingly.

Table 5: Seismic protection costs, storage tanks, 20-year present value

Flexible Mechanical Devices	Footing Anchor	Pile Foundation
$8,264,419	**$50,402,549**	**$452,797,211**

During the public comment period for this rulemaking, we received feedback and external analysis estimating costs of seismic retrofits for a subset of Class 1 facilities, with results within the overall range estimated above. We reiterate that retrofit decisions will be based on facility, equipment, and property attributes, as well as other facility and business needs, and our overall range does not make assumptions about which type (or multiple types) of retrofit facilities will choose. Any assumptions made about these choices will significantly affect cost estimates, as reflected by the large range of estimates across different approaches to seismic protection. Other factors, including equipment type and age, could impact the timing or frequency of future replacement or maintenance, which would increase the costs presented above. See section 4.2.3.3 for discussion of alternative assumptions about the timing of these costs as allowed by the compliance schedules.

Commenters also indicated that facility production losses due to retrofit activities should be included in the estimated costs of the rule. Section 4.2.1.6.1 of our analysis discusses the types and magnitudes of production losses associated with reduced capacity or downtime. Given the compliance schedules required under the rule, we assume facilities will choose the least-cost timing of retrofit activities.

3.2.1.7 Seismic requirements – transfer pipelines

The rule is likely to result in costs associated with installation, design, permitting, construction, and maintenance of additional seismic protection measures at existing transfer pipelines or with seismic standards for new or changed pipelines.

For the 23 Class 1 facilities, we estimated the amount and attributes of transfer pipelines based on Ecology records for each facility. We then estimated costs using standardized cost estimates for facility construction activities[16] for each facility's potential needs for:

- Materials
- Engineering
- Overhead

[16] Ibid.

- Construction management
- Additional contingency

We estimated these costs for potential installation of the options for seismic protections for transfer pipelines, accounting for transfer pipelines that already use any of the options:

- Emergency valves
- Sliding plates

Costs estimates per facility varied, as summarized below, and are based on individual facility attributes.

Table 6: Seismic protection costs, transfer pipelines

Descriptive Statistic	Emergency Valves	Sliding Plates
Minimum	**$230,546**	**$164,970**
Median	**$396,894**	**$513,889**
Maximum	**$1,341,731**	**$13,614,624**
Total for 23 facilities	**$12,436,183**	**$38,641,144**

These costs will be incurred once, but the timing would be left to the facilities themselves within the compliance timeframe limit of 10 years or greater based on the facility's internal API Standard 570 inspection. Based on the compliance schedules in the rule amendments, we made a centrally conservative assumption that engineering and overhead costs would be incurred immediately (though this would likely happen later), while materials, construction management, and additional contingency (for example due to extended timetables) would be incurred in year 5.

The 20-year present values of these costs are summarized below. While we might assume facilities will choose the least-cost compliance option, we acknowledge they will consider these costs in conjunction with facility and property attributes related to seismic risk, other facility needs, and business needs, and will choose seismic protections accordingly.

Table 7: Seismic protection costs, transfer pipelines, 20-year present value

Emergency Valves	Sliding Plates
$11,885,333	**$36,878,708**

See section 4.2.3.3 for discussion of alternative assumptions about the timing of these costs as allowed by the compliance schedules.

During the public comment period for this rulemaking, we received feedback and external analysis estimating costs of seismic retrofits for a subset of Class 1 facilities, and expressing concern about factors that would increase costs of the rule. See discussion in Section 3.2.1.6 for additional details, as they apply to both tank and transfer pipeline seismic retrofits.

3.2.1.8 Operations Manual submittal

The rule will result in minor time-related costs or cost-savings related to earlier or later submittal requirements.

To illustrate the difference in costs at different times, the table below shows the value of each $1 in present value terms depending on when it is spent. These costs are discounted across future and present using a 0.89% real discount rate[17] that accounts for inflation as well as the opportunity cost of having funds later instead of now.

Table 8: Impacts of timing on costs

Timing change	Present Value	Percent Difference
1 month earlier	**$0.999**	**-0.07%**
2 months later	**$1.001**	**0.15%**

3.2.1.9 Substantial change

Defining a substantial change in oil handling capacity provides clarity and consistency for this requirement with the existing requirement for Class 1 facility Prevention Plans. This will reduce overcompliance related to broader interpretation of substantial change, and reduce undercompliance related to a more limited interpretation of substantial change that results in failure to notify Ecology and update the manual. Depending on how facilities interpret the baseline requirements, this could result in increases or decreases of costs associated with notification and operations manual updates.

We could not quantify the degree to which over- or under-compliance with the rule amendments occurs under the baseline. This is because the baseline language is not specific in defining what a substantial change is.

We expect these costs or benefits to be minimal, as substantial change is already defined under Chapter 173-180 WAC for Class 1 facility Prevention Plans and is consistent with the rule amendments. This is likely to result in no impact, and function as a clarification, as facilities are likely to identify undefined baseline substantial change in the existing rule in a way that is consistent with other regulations.

3.2.1.10 Follow-up training

We do not expect costs associated with these rule amendments, as compared to the baseline.

3.2.1.11 Training and Certification Program

These amendments will result in minor timing-related costs associated with earlier implementation of training and certification programs. To illustrate the difference in costs at different times, the table below shows the value of each $1 in present value terms depending on when it is spent. These costs are discounted across future and present using a 0.89% real

[17] US Treasury Department, 2022. I bonds interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.

discount rate[18] that accounts for inflation as well as the opportunity cost of having funds later instead of now.

Table 9: Impacts of timing on costs

Timing change	Present Value	Percent Difference
1 month earlier	**$0.999**	**-0.07%**
2 months later	**$1.001**	**0.15%**

If a significant change does occur at a facility, it would incur some additional costs associated with Prevention Plan updates for Class 1 facilities or identifying changes to Ecology for Class 2 facilities.

3.2.1.12 Prevention Plan

These amendments will result in costs associated with:

- Providing additional information regarding personnel and contact information:
    - We estimated costs for 23 Class 1 facilities. We assumed the rule amendments would result in an additional hour updating Prevention Plan contents (excluding the items below) in line with the rule amendments. Using the median hourly wage for "Petroleum engineers" of $64.27 per hour (2022-dollars)[19,20], this would result in a one-time cost of $1,478 in each planning cycle.
    - The 20-year present value of this cost estimate is approximately $5,000.
- Potential additional analysis and documentation of secondary containment permeability, depending on interpretation of baseline requirements:
    - We assumed the rule amendments could result in an additional 16 hours of labor. Using the median hourly wage for "Petroleum engineers" of $64.27 per hour (2022-dollars)[21,22], and adding overhead costs (reflecting external labor costs) to estimate a loaded hourly wage of $116.95 this would result in a one-time cost of $23,651 in each planning cycle. We also examined higher costs associated with wages, overhead, and consultant markup, using a loaded hourly wage of $400, resulting in a one-time cost of $147,200 in each planning cycle.

[18] US Treasury Department, 2022. I bonds interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.
[19] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[20] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[21] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[22] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

- The 20-year present value of this cost estimate is between approximately $160,000 and $547,000.
- If this analysis identifies needed changes to secondary containment permeability, a facility may incur additional costs. These costs would vary, depending on the identified needs. If no such changes are identified, no additional costs would be incurred.

- Potential additional risk analysis, depending on interpretation of baseline requirements:
  - We assumed these rule amendments could result in an additional 120 hours of labor. Using the median hourly wage for "Petroleum engineers" of $64.27 per hour (2022-dollars)[23,24], and adding overhead costs (reflecting external labor costs) to estimate a loaded hourly wage of $116.95 this would result in a one-time cost of $177,000 in each planning cycle. We also examined higher costs associated with wages, overhead, and consultant markup, using a loaded hourly wage of $400, resulting in a one-time cost of $1.1 million in each planning cycle.
  - The 20-year present value of this cost estimate is between approximately $0.7 million and $4.1 million.
- Submitting the plan earlier than under the baseline:
  - To illustrate the difference in costs at different times, the table below shows the value of each $1 in present value terms depending on when it is spent. These costs are discounted across future and present using a 0.89% real discount rate[25] that accounts for inflation as well as the opportunity cost of having funds later instead of now.

Table 10: Impacts of timing on costs

Timing change	Present Value	Percent Difference
1 month earlier	**$0.999**	**-0.07%**
2 months later	**$1.001**	**0.15%**

3.2.1.13 Oil Transfer Response Plan

Under the rule amendments, 22 Class 2 facilities are likely to incur the following costs:

- Minor formatting, binding written statement, container description, and transfer location listing costs.

[23] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[24] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[25] US Treasury Department, 2022. I bonds interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.

- Notification costs.
- Minor recordkeeping and records access cost.

We assumed the rule amendments could result in an additional four hours of labor. Using the median hourly wage for "Petroleum engineers" of $64.27 per hour (2022-dollars) [26,27], this would result in a one-time cost of $5,656 in each planning cycle.

The 20-year present value of this cost estimate is approximately $21,000.

3.2.1.14 Drill requirements

Under these amendments, 22 Class 2 facilities would incur costs of planning drills with Ecology and their company planner.

We assumed the rule amendments could result in an additional 16 hours of labor. Using the median hourly wage for "Health and safety engineers, except mining safety engineers and inspectors" of $53.31 per hour (2022-dollars) [28,29], this would result in a one-time cost of $18,765 in each planning cycle.

The 20-year present value of this cost estimate is approximately $70,000.

3.2.1.15 Out of service requirements

The rule is likely to result in costs of either continuing to maintain storage tanks and transfer pipelines as though they were in use, or costs of decommissioning and notification. Facilities would choose the least-cost option, accounting for relative costs and tradeoffs of the options available to them. We estimated costs for 23 Class 1 facilities.

Notification

For notification costs, we assumed the rule amendments would result in an additional two hours. For consistency with available decommissioning cost data (below), we assumed frequency of decommissioning based on units of tank systems (involving the tanks and pipelines for a large industrial unit). We assumed the equivalent of one tank system would go out of service every 10 to 20 years.

[26] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[27] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[28] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[29] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

Using the median hourly wage for "Petroleum engineers" of $64.27 per hour (2022-dollars)[30,31], this would result in an annual cost of $148 to $296.

The 20-year present value of this cost estimate is between approximately $3,000 and $5,000.

Decommissioning

We acknowledge decommissioning costs will depend on multiple factors specific to the site, storage tank, and transfer pipeline involved. We therefore based cost estimates on a range of assumptions based on estimated decommissioning costs at a series of energy facilities[32], including specified costs of:

- Sealing pipes and connections.
- Cleaning tanks.

We also examined information on the number of units being decommissioned at each facility, across which storage tanks and pipelines were common or distributed, to estimate the number of tank systems represented by each decommissioning cost reported. Depending on facility attributes, costs ranged between $8,000 and $101,000 (2022-dollars[33]) per tank system.

Using the same assumption that the equivalent of one tank system would be decommissioned every 10 to 20 years, we estimated Class 1 facilities would incur an equivalent statewide annual cost of $29,000 to $58,000.[34]

The 20-year present value of these cost estimates is approximately $0.5 million to $1.1 million.

3.2.2 Chapter 173-184 WAC (Vessels)

3.2.2.1 Recordkeeping

We expect the rule amendments to generate minor administrative recordkeeping costs. We estimated costs for 3 identified regulated delivering vessel companies.

We assumed the rule amendments would result in an additional hour quarterly ensuring records are being retained as required. Using the median hourly wage for "Information and

[30] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[31] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[32] Duke Energy, 2017. Decommissioning Cost Estimate Study. April 19, 2017.
[33] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[34] Estimates presented are median values. Overall ranges are $9,000 to $117,000 using a 20-year assumption, and $18,000 to $233,000 using a 10-year assumption.

records clerks, all other" of $23.58 per hour (2022-dollars)[35,36], this would result in an annual cost of $283.

Ecology estimates costs and benefits of rulemakings in 20-year present values. A present value converts streams of future costs and benefits into a current total value that reflects both inflation and the opportunity cost of having funds later instead of now. Future values are discounted using a real (inflation-adjusted) discount rate of 0.89%.[37]

The 20-year present value of this cost estimate is approximately $6,000.

3.2.2.2 Advance Notice of Transfer

*Due to data attributes, Section 3.2.1.3 (above) reflects ANT-related costs for facilities **and** vessels.*

- For transfers with a change in timing greater than six hours, the rule amendments will result in costs associated with resubmission of the updated ANT.
- The additional information reported in the ANT brings these requirements into consistency with statutory baseline requirements and similar requirements in other rules. Ecology used discretion in including specific gravity, sulfur content, and viscosity. The rule is likely to generate administrative costs above the baseline, associated with reporting this additional known information using an electronic format.

3.2.2.3 Prebooming requirements

Rule amendments may result in pre-booming where previously they might not have. We were not able to identify or make reasonable assumptions about the frequency with which additional prebooming may be conducted compared to the baseline. In such cases, additional labor would be required to preboom.

3.2.3 Both rules (Facilities and vessels)

3.2.3.1 Definitions

Definitions do not have an impact in and of themselves but may impact costs where they are used in rule requirements. Relevant costs are discussed in the sections in which each requirement is discussed.

[35] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm

[36] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

[37] US Treasury Department, 2022. I bonds interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.

3.2.3.2 Noncompliance

These amendments are intended to facilitate use of corrective actions other than enforcement and penalties. By including conditional approval, compared to the baseline, they reduce potential costs and disruption associated with noncompliance, while maintaining the rule's protections for the environment, public health, and property. We do not expect these rule amendments to result in costs, as compared to the baseline.

3.2.3.3 Compliance schedules

The adopted compliance schedules allow entities time to come into compliance with new rule requirements. This results in a timing-related cost-savings by delaying compliance costs and allowing for more planning time. We do not expect these rule amendments to result in costs, as compared to the baseline.

3.2.3.4 Electronic submission

We do not expect these rule amendments to result in costs, as compared to the baseline.

3.2.3.5 Conditional approval

Compared to the baseline, conditional approval as clearly defined under the rule amendments provides additional guidance in cases where the relevant plans do not initially meet requirements for approval. This reduces the potential costs and business disruption of plan disapproval or noncompliance resulting in enforcement or penalties. The rule identifies potential conditions (requirements) that would need to be met under conditional approval, which align with meeting the requirements of the rules themselves while correcting plans. We therefore do not expect costs associated with these rule amendments, as compared to the baseline.

3.2.3.6 Rate A prebooming and alternative measures

These rule amendments will result in additional costs to resubmit Boom Reporting Forms.

Resubmittal

There are currently over 12,200 ANTs submitted each year, on average. We assumed between 25% and 50% of those were Rate A transfers impacted by the rule amendments in their use of Boom Reporting Forms. We assumed 50% of Boom Reporting Forms would need to be resubmitted due to ongoing conditions that exceed safe and effective values, and that resubmittals would take 0.25 hours (15 minutes). Using the median hourly wage for "Office and administrative support occupations" of $27.50 per hour[38], this would result in a statewide annual cost of between $11,000 and $21,000.[39]

[38] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm

[39] Wage and hour assumptions reflect revised time likely required for form resubmittal and work being performed by different staff than was assumed in the Preliminary Regulatory Analyses for this rulemaking.

The 20-year present value of this cost estimate is between approximately $192,000 and $385,000.

However, this could also result in additional booming of transfers where previously they might not have. We were not able to identify or make reasonable assumptions about the frequency with which additional booming may be conducted. In such cases, additional labor would be required to boom.

Multiple transfers

We were not able to identify or make reasonable assumptions about the frequency with which circumstances would arise during which additional prebooming is done under the rule amendments relating to multiple simultaneous transfers. In such cases, additional labor would be required to preboom.

3.2.3.7 Safe and Effective Threshold Determination Report

These rule amendments will result in costs associated with the additional effort required to add newly specified elements to the report.

We conservatively assumed all Class 1 facilities, and 3 delivering vessel companies[40] would be impacted by these amendments, totaling 26 entities. We assumed facilities and vessels would need an additional 16 hours of labor to complete the additional requirements.[41] Using the median hourly wage for "Petroleum engineers" of $64.27 per hour (2022-dollars)[42,43] at Class 1 facilities, and for "Occupational health and safety specialists" of $41.94 at delivering vessel companies,[44] this would result in a cost of $26,000 in each planning cycle.

The 20-year present value of this cost estimate is approximately $95,000.

3.2.3.8 Changes without material impact

These amendments do not impact rule requirements and are not expected to result in costs as compared to the baseline.

[40] Centerline Logistics, Maxum Petroleum, Vane Brothers.
[41] Based on consultation with Class 1 facility representatives, we revised the hours assumed for completing this task.
[42] US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm
[43] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[44] Ibidem. This work would likely be completed by different staff at delivering vessel companies than at Class 1 facilities, and estimates reflect median wages for Occupational Health and Safety specialists.

Chapter 4: Likely Benefits of the Rule Amendments

4.1 Introduction

We analyzed the likely benefits associated with the rule amendments, as compared to the baseline. The rule amendments and the baseline are discussed in detail in Chapter 2 of this document.

4.2 Benefits analysis

The rule amendments make the following changes:

- Chapter 173-180 WAC – Facilities:
    - Extending timelines and contents of recordkeeping requirements.
    - Adding flexibility in transfer equipment testing standards.
    - Adding resubmission criteria and required contents to Advance Notice of Transfer (ANT) for Class 1, 2, and 3 facilities.
    - Specifying process timing for Equivalent Compliance Plan submittal and approval.
    - Removing ineffective oil transfer procedure requirements.
    - Adding seismic requirements for storage tanks.
    - Adding seismic requirements for transfer pipelines.
    - Adjusting process and requirements of Class 1 and 2 Operations Manual submittal.
    - Defining substantial change in a Class 1 facility's oil-handling capacity.
    - Clarifying required follow-up training.
    - Adjusting timing, update, and notification requirements for Class 1 and 2 facility Training and Certification Programs.
    - Expanding Class 1 facility Prevention Plan contents including secondary containment and risk analysis criteria and timing.
    - Expanding Class 2 facility Oil Transfer Response Plan format and content requirements.
    - Specifying drill requirements for Class 2 facilities.
    - Adding out of service and decommissioning requirements for Class 1 facilities.
- Chapter 173-184 WAC – Vessels:
    - Expanding recordkeeping and records availability requirements.

- Adjusting timing, resubmission criteria, and contents of ANT for delivering vessels.
- Clarifying Rate A prebooming requirements for safe and effective threshold values for locations not covered in the report and for lightering.

- Both rules:
  - Adding definitions to facilitate rule requirements.
  - Specifying Ecology enforcement actions regarding noncompliance.
  - Specifying compliance schedules for new rule requirements.
  - Removing the option to submit paper or faxed copies of reports and plans.
  - Streamlining the conditional approval process and requirements for:
    - Safe and Effective Threshold Determination Reports.
    - Equivalent Compliance Plans.
    - Class 1 facility Prevention Plans and Operations Manuals.
    - Class 2 facility Oil Transfer Response Plans and Operations Manuals.
    - Class 1 and 2 facility Training and Certification Program.
  - Expanding Rate A prebooming and alternative measures requirements:
    - Recommended consideration of additional prebooming.
    - Reporting criteria and contents of Boom Reporting Form.
    - In cases of multiple simultaneous transfers.
  - Expanding required contents of Safe and Effective Threshold Determination Report.
  - Clarification and reorganization without material impact.

4.2.1 Chapter 173-180 WAC (Facilities)

4.2.1.1 Recordkeeping

We expect these rule amendments to generate clear and comprehensive information about equipment, secondary containment, and Class 4 facility training. Having this information consistently available facilitates understanding of compliance as well as potential causes of failure.

As we could not confidently estimate the frequency and importance of the use of expanded records, we discuss this benefit qualitatively. By improving the information available in the event of a spill, or otherwise, the rule amendments facilitate improved planning and prevention that reduces the likelihood of future spill impacts.

4.2.1.2 Transfer equipment testing standards

If a facility chooses to propose an alternative testing method, and that method is approved by Ecology, we expect the rule amendments to reduce compliance costs without reducing the effectiveness of transfer equipment testing.

As we could not confidently estimate the frequency of facilities proposing (and Ecology approving) an alternative transfer equipment testing method, we discuss this benefit qualitatively. By allowing this flexibility, however, in conjunction with the requirement that methods must be at least equally effective, the rule amendments would reduce the overall costs of equipment testing for facilities that use this option.

4.2.1.3 Advance Notice of Transfer

For transfers with a change in timing greater than six hours, the rule amendments will result in benefits of timely and accurate information about the transfer.

The additional information reported in the ANT will bring these requirements into consistency with statutory baseline requirements and similar requirements in other rules. Ecology used discretion in including specific gravity, sulfur content, and viscosity. The rule is likely to generate benefits of comprehensive and consistent reporting requirements and information about the transfer. We note that currently all but one company submits this information electronically.

The purpose of ANT requirements is to identify transfers for inspectors to visit for compliance purposes and to help prepare for spills. By ensuring ANTs include comprehensive and consistent information to achieve this goal – including specific gravity, sulfur content, and viscosity that inform necessary equipment and procedures in spill prevention and response – these rule amendments reduce the likelihood of spill cleanup costs and impacts on the environment, public health, and property (see discussion of these costs in section 4.2.1.6, below).

4.2.1.4 Equivalent Compliance Plan

The rule amendments will result in potential cost-savings associated with only requiring electronic submission of the plan, as compared to submitting a physical and electronic plan. (See section 4.2.3.4 below.)

Additional guidance for conditional approval will retain the spill-related environmental, public health, and property protections of the rule in the event a plan is conditionally approved. (See section 4.2.3.5 below.)

4.2.1.5 Oil transfer procedure

We expect these amendments to result in:

- Potential cost-savings associated with eliminating the shutoff nozzle requirement, without impacting the effectiveness of the rule.
- Potential benefits of identifying or reducing risk of conditions that may result in a spill, in cases where facilities and vessels involved in these transfers do not interpret the

baseline language to apply also to discharging tanks and other tanks. As they may be considered a clarification, it would not generate costs or benefits in those cases.

As we could not confidently estimate the frequency of shutoff nozzle use and purchase under the baseline, we discuss this benefit qualitatively. Ecology identified that this baseline requirement was not effective for the purpose for which it had been required. It was therefore unnecessary to maintain the requirement, as it does not effectively protect the environmental, public health, and property values that would be impacted by a spill. Correspondingly, while we expect the rule amendment eliminating the shutoff nozzle requirement to reduce compliance costs where it has been, or would be, implemented, we do not expect any corresponding impacts to the protectiveness of the rule.

Similarly, we could not confidently estimate the frequency with which the baseline rule language is interpreted as not applying to discharging tanks or other tanks. Where this is the case, we expect a reduction in the risk of spills, and avoidance of their associated costs (see discussion of these costs in section 4.2.1.6, below).

4.2.1.6 Seismic requirements – storage tanks

The rule amendments are likely to result in installation, design, permitting, construction, and maintenance of additional seismic protection measures at existing tanks or with seismic standards for new tanks. These improved protections result in a reduced likelihood of equipment damage and spills in the event of seismic activity, considering site-specific attributes such as soil properties and tsunami risk. This, in turn, reduces the risk of impacts to the environment, public health, and property that result from spills and earthquakes.

4.2.1.6.1 Quantified benefits

Earthquake size and timing

For our cost estimates, we assumed a very large earthquake affecting the whole region. As this is consistent with the expected Cascadia earthquake, we assumed there was a 10% chance of it happening in the next 50 years[45], or a 0.2% chance of it happening in a given year. We note that compliance with the rule amendments does not guarantee all spills or damages from earthquakes would be avoided, but the likelihood or size of spills would be reduced.

Facility Data

Using the same Class 1 facility data used to estimate costs (see Chapter 3), we identified the number of tanks and total volume.

[45] WA Department of Natural Resources, 2022. New Study Details Tsunami Impacts of Magnitude 9.0 Earthquake to Olympic Peninsula. https://www.dnr.wa.gov/news/new-study-details-tsunami-impacts-magnitude-90-earthquake-olympic-peninsula#:~:text=The%20last%20Cascadia%20rupture%20was,in%20the%20next%2050%20years.

Table 11: Total storage tanks and volume, Class 1 facilities

Number of Tanks	Volume (gallons)
604	**1,488,863,950**

Degree of impacts

Earthquakes and their impacts are notoriously complex and difficult to forecast. The scope of impacts depends on the attributes and activities at affected facilities, their location and soil characteristics, and the surrounding natural and built environment. We were not able to model the precise impacts to every tank at every Class 1 facility for every type of seismic activity.

There is also limited data available supporting specific estimates of tank or pipeline damage, failure, and spill magnitude. We note some information on the impacts of earthquakes on tanks and pipelines is available from FEMA[46] and regarding the 2011 Japanese earthquake and tsunami.[47] Those studies reflected an overall range of 17% to 96% damages, largely resulting in spills on site and to nearby waterways, or presumably in the water or at other locations due to being washed away by a tsunami. They also indicated the types of seismic protections in the rule amendments are protective in the event of large earthquakes. A recent study also estimated the impacts of a large earthquake on a riverfront tank farm in Oregon, estimating significant impacts to the environment, public health, and infrastructure.[48]

We therefore instead considered various unit costs associated with oil spills, and identified the size of spill and corresponding percentage of additional protection for storage tanks and transfer pipelines, which would reflect sufficient quantifiable benefits to offset costs of compliance with the rule amendments.

Likely 20-year present value costs of the rule amendments (see Chapter 3) range between $25.0 million and $498.8 million, and are primarily driven by seismic protection costs that comprise 81% to 98% of total estimated costs. Similarly, we expect all the rule amendments to contribute to improved spill prevention and preparedness, and a large portion of this would arise from improved seismic protection for storage tanks and transfer pipelines.

Quantifiable costs of spills

Using estimates presented in an Oregon tank farm earthquake study,[49] based in recent review of relevant literature, we estimated a subset of corresponding costs of oil spills per gallon.

[46] US Federal Emergency Management Agency, 1992. Earthquake Resistant Construction of Gas and Liquid Fuel Pipeline Systems Serving, or Regulated by, the Federal Government. FEMA-233, July 1992.
[47] Zama, S, H Nishi, K Hatayama, M Yamada, H Yoshihara, and Y Ogawa, 2012. On Damage of Oil Storage Tanks due to the 2011 off the Pacific Coast of Tohoku Earthquake (Mw9.0), Japan. 15 WCEE, Lisboa 2012.
[48] ECONorthwest, 2022. Impacts of Fuel Releases from the CEI Hub, Due to a Cascadia Subduction Zone Earthquake.
[49] Ibid.

Table 12: Unit costs associated with oil spills

End of Cost Range	Cleanup (per gallon)	Habitat Restoration (per gallon)	Navigation (per gallon)	Total (per gallon)
Low	**$1.15**	**$0.42**	**$0.09**	**$1.66**
High	**$7.23**	**$1.57**	**$0.12**	**$8.92**

Based on the total per-gallon cost range above, we estimated the following range of spill size that would offset estimated 20-year present value costs of the rule amendments. Recall that these avoided spill volumes would not manifest as a single avoided spill, but as a total avoided spill volume across all Class 1 facilities in the state (in the event of a large earthquake) and to a lesser degree all regulated entities (through improved preparedness). Note also that these avoided spills would not need to occur at the same time but could be distributed over time across multiple seismic events.

Table 13: Spill prevention needed to offset cleanup, restoration, and navigation costs

Total 20-Year Present Value Cost	Cleanup, Habitat Restoration, and Navigation Cost (per gallon)	Total Equivalent Volume of Avoided Spills (gallons)	Percentage of Class 1 Storage Tank Volume
$22,287,956	**$1.66**	**13,396,006**	**0.90%**
$22,287,956	**$8.92**	**2,497,700**	**0.17%**
$493,341,378	**$1.66**	**296,519,058**	**19.92%**
$493,341,378	**$8.92**	**55,286,297**	**3.71%**

Were we to focus specifically on a **single** very large earthquake with an average 0.2% chance of happening in a given year, we would divide these 20-year values by 0.04, resulting in estimates 25 times larger that reflect this assumed single-earthquake risk. This would increase the equivalent volume of avoided spills to an overall range of 5% (reflecting lowest-cost compliance options and high unit costs for spill cleanup, restoration, and navigation disruption) to more than five times the total storage volume of Class 1 facilities (reflecting highest-cost compliance options and low unit costs for spill impacts). We acknowledge that including this risk component significantly compounds uncertainty, resulting in this broad range, but note this is expected in the context of earthquake preparedness.

Avoided property value impacts

We surveyed property values of properties near Class 1 facilities[50] excluding the values of the industrial properties themselves, as they are likely to have property values differently impacted by spills than residential, commercial, or public property. These property values totaled over $2.1 billion, excluding many values of publicly owned or tribally owned lands, and in many cases not reflecting the value of all improvements. Applying a 4% to 12% reduction to this value,

[50] Clallam County Assessor, 2022; Clark County Assessor, 2022; Franklin County Assessor, 2022; Grays Harbor County Assessor, 2022; King County Assessor, 2022; Pierce County Assessor, 2022; Skagit County Assessor, 2022; Whatcom County Assessor, 2022.

reflecting literature estimates of the impact of spills on property values,[51] we estimated property value impacts between $86 million and $258 million resulting from large nearby spills at all Class 1 facilities, if they impacted properties within a half mile. These impacts would vary depending on spill attributes, waterbody attributes, and property characteristics, including potential impacts to different or broader areas potentially extending to nearby counties in which a facility is not located.[52] For discussion of broader impacts, including impacts to nearby county values and statewide values, see "Population-wide values for avoiding spills" under Section 4.2.1.6.2 below.

Avoided facility losses

Sightline Institute identified property values of over $2.4 billion at the five refinery properties in Washington.[53] If just these five (of 23 Class 1) facilities avoided losing between 1% and 21% of their property value due to earthquake losses due to damaged storage tanks and transfer pipelines, as a result of improvements made under the rule amendments, it would offset our estimated total 20-year present value costs of the amendments.

To clean up spills and repair or replace equipment, Class 1 facilities would also likely shut down for some period of time. The degree of shutdown would depend on the degree of damage, and whether impacts to other parts of the facility were driving factors. For illustration, one article estimated a single shutdown event could, on average, cost a refinery $36.4 million.[54] Another estimated that depending on profit margins and oil prices, an average refinery could lose between $340,000 and $1.7 million per day of shutdown.[55] A third article places costs of downtime at a lower $2 million per episode.[56] GE estimated the hidden costs of lost or deferred production as $20,000 per day, and identified that 3.65 downtime days can cost organizations in the oil and gas industry over $5 million.[57]

4.2.1.6.2 Partially quantified and qualitatively discussed benefits

We could not fully quantify benefits of the rule amendments in terms of reduced impact to:

---

[51] ECONorthwest, 2022. Impacts of Fuel Releases from the CEI Hub, Due to a Cascadia Subduction Zone Earthquake.

[52] Values presented in text reflect a half-mile radius from facilities or centroids of geographically proximate facilities. Scaled to a one-mile radius, these values increase by a factor of four, to $344 million to $1 billion. Depending on spill extent and attributes, potentially affected property impacts within a radius scale by (radius in miles/0.5)^2.

[53] Sightline Institute, 2021. Oil Refinery Profits, Taxes, and Spending: A Primer. October 6, 2021.

[54] Kostyukov, A, A Kostyukov, and S Boichenko, 2020. Where transparency-driven value comes from. Digital Refining. January 2020.

[55] Gecko Robotics, 2021. The cost of Unplanned Downtime for Refineries. July 28,2021. Citing the American Institute of Chemical Engineers.

[56] Peleg, LA, 2021. Increase Refinery Availability by Predicting Failures Before They Happen. Precognize, a Samson Company. January 29,2021.

[57] GE Oil and Gas, 2016.The Impact of Digital on Unplanned Downtime.

- Cultural values and environmental justice.
- Surface water quality.
- Groundwater quality.
- Fisheries.
- Shellfisheries.
- Bird populations.
- Sea mammals.
- Endangered species.
- Animals consuming contaminated fish or shellfish.
- Recreational quality.
- Passive or non-use values for nature.
- Public health and safety:
    - Fire.
    - Air quality.
    - Toxic chemical exposure.
    - Drinking water contamination.
    - Subsistence or traditional food source contamination.
    - Evacuation.
    - Property damage and contamination.

Reduced likelihood of significant spills across Class 1 facilities in the event of a large regional earthquake also reduces impacts to the above list.

Avoided impacts to Tribes and Tribal resources

Oil spills have direct and indirect impacts to Tribal resources and lifeways, and many Class 1 facilities are located near Tribal lands. Direct impacts of spills include harm to resources such as fisheries and shellfisheries, through reduced access or ongoing contamination. These fisheries hold significant economic, cultural, and subsistence values. Impacts can range from reduced market harvest, to reduced nutritional and calorie availability, to increased contamination of fish (and associated health impacts or foregone consumption), to reduced access to restoring and maintaining tribal lifeways for future generations. Spills create direct and indirect harm to land, waters, and animals (including fish and orcas) held in spiritual reverence and seen as family.

While each Tribal culture and experience is unique, we can learn about the impacts of oil spills through a tribal lens through the words of Tribal members in Washington and beyond:

- "When the Exxon Valdez supertanker crashed and spilled 10.8 million gallons of oil into Prince William Sound, the life of the waters was crippled almost beyond repair. 22 killer whales died as an immediate result of the spill. We recognize killer whales as part of our family. Our word for them is qwe 'lhol mechen, which means "our relations under the waves." Untold numbers of herring and salmon died as an immediate result of the spill, and untold numbers of those fish will never be born. We must stand together in protecting our herring, our salmon, our killer whales, our traditional lifeways, and the waters that sustain us." - Lawrence Solomon, Lummi Nation Council Secretary[58]
- "As Nu-chan-nulth people, the Makah base our cultural way of life on the religious belief that a balance exists in the world, and we hold the bountiful resources of the earth and the oceans in spiritual reverence. We also fundamentally depend on the ocean and its resources for our fisheries-based economy and subsistence harvest which sustains our community. Over one million gallons of oil have been spilled in our treaty area since the 1970s." – John Ides Sr., Chairman Makah Tribal Council.[59]
- Regarding the Deepwater Horizon spill's impacts on the Houma Nation in Louisiana: "My biggest concern is the future of our people. We have lived off the land, we have lived in our traditional homeland for generation after generation. I have great concern of what the oil spill is going to do to our communities. You know, we grow up learning how to deal with hurricanes. We have experienced four devastating hurricanes in the last three years. Our people are resilient. We know how to gut out our homes, rebuild, repair our fishing vessels and move on. But this is totally different. The impact that this could be totally devastating to our tribal citizens and it's quite frightening… You know, I grew up with my dad being a fisherman. He's 74 years old and he still does that today, as his father did prior to him. And so to see him now not being able to go out on his fishing vessel is just heartbreaking. He often describes it as being Christmas every day when he's out on his boat because there's a love that he has for that. And at 74 and the fishing season being closed and not knowing when it's going to open again, my concern is that he may never experience another Christmas. And that's the case with a lot of our tribal citizens. This is the lifestyle that they know and love. It's not just a piece of land for us. It's not just something they do, you know, for recreation. It's our way of life. And to have that threatened is just devastating." – Houma Chief Brenda Dardar-Robichaux.[60]

Population-wide values for avoiding spills

One way of estimating the value that the public holds for avoiding oil spills is willingness to pay for spill prevention or immediate cleanup that would minimize impacts. Willingness to pay reflects public understanding of the combined costs of spills and their personal values, resources, and preferences, including non-market values for the environment. A 1995 case

[58] https://wecprotects.org/news/on-exxon-valdez-disaster-30th-anniversary-local-leaders-call-on-state-to-protect-washington-from-major-spill/
[59] Ibid.
[60] https://www.npr.org/templates/story/story.php?storyId=127405886

study of willingness to pay to prevent spills on the California coast indicates the value placed on prevention at $93.82 per household (2022$).[61] The case study assumed 100% of spills would be immediately addressed for a ten-year period. Therefore, the losses for the California study may be more appropriate for the smaller, more frequent spills than for the large and geographically spread-out spills that would be caused by a large earthquake. For the 2.8 million households in Washington, the collective willingness to pay would be $259 million (2022$) for ten-year protection, or $492 million in 20-year present value for two payments ten years apart.

In 2004, Ecology funded extensive modeling of potential spills in Washington.[62] Adjusted for inflation, a single large spill in Washington could result in losses of over $15 billion (2022-dollars[63]). These values still excluded non-use values such as bequest values for future generations, animal welfare, and existence values for affected species (including potential impacts to endangered Southern Resident Killer Whales), and values for public wellbeing in oiled areas.

Spills from some Class 1 facilities could affect the Columbia River. The Columbia is the largest river in the Pacific Northwest and is over a thousand miles long. It is a large regional source of water, hydropower, transportation, recreation, and habitat. In particular, it is home to or a place of transit for multiple fish species, and specifically salmon species (some of which are listed as protected under the Endangered Species Act on sections of the Columbia or its tributaries) and the white sturgeon (the population of which is divided into landlocked populations between the river's dams, except below Bonneville Dam).

Recreational areas thrive on and near the river throughout its course. Downriver, the Columbia River Gorge is a National Scenic Area that attracts $61 million (2022$) in annual spending in local communities on the Oregon side of the river.[64] The river (including, but not limited to, its fisheries) is of significant historical and cultural value to multiple regional tribes.

Even after spills are cleaned up, and surviving wildlife has been cleaned, there may be long-run impacts to wildlife wellbeing. These may manifest as wildlife mortality during cleanup, or as long-run morbidity and mortality from exposure to toxins in the oil (external or through ingestion).[65] Improved survival or reduced toxicity of plants and animals that are important

[61] Carson, RT, MB Conaway, WM Hanemann, JA Krosnick, RC Michael, S Presser, 2004. Valuing Oil Spill Prevention: A case study of California's Central Coast. Kluwer Academic Publishers, 2004.
[62] Environmental Research Consulting, 2004. Socioeconomic Cost Modeling for Washington State Oil Spill Scenarios. Prepared for Washington State Department of Ecology. July 2004.
[63] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[64] White, EM and D Goodding, 2013. Spending and Economic Activity from Recreation at Oregon State Park Properties – Columbia River Gorge Management Unit. Oregon State University. June 2013. https://www.oregon.gov/oprd/PLANS/docs/scorp/2013-2018_SCORP/Gorge_Economic_Impact%20Report.pdf
[65] Shigenaka, G, 2015. Biological Effects of Crude Oil Spills. Presentation to the National Academy of Sciences. March 10, 2015.

food sources for other animals (e.g., shellfish for otters, or salmon for orcas) would result in additional benefits for animals higher on the food chain.

In 2012, a survey of households found a willingness to pay an average of $49.69 (2022$) per household, per year, for ten years for the recovery of Puget Sound Chinook salmon (removal from the list of threatened species). For the 2.8 million households in Washington, this translates to an annual willingness to pay of $137 million (2022$), or over $1 billion in present value over ten years. While values for salmon are typically thought of in the context of marine oil spills, inland oil spills can affect spawning areas and habitat for salmon fry and parr, as well as adults traveling inland to spawn, and smolt traveling to sea.

The Southern Resident Killer Whale Chinook Salmon Initiative reports that:[66]

- Wildlife watchers spend nearly $1.2 billion (2022$) annually in Washington, primarily in rural areas.
- In 2001, 47% of Washington's residents participated in wildlife watching, compared to 16% in fishing and 5% in hunting.
- Wildlife watching activities support more than 21,000 jobs in Washington State, yield $500 million (2022$) in job income, and generate $70 million in state and $83 million in federal tax revenues each year, based on 2001 data.
- The value of the overall whale watching industry in Washington State is worth at least $80-$86 million (2022$) annually.
- An estimated 42 whale watch companies operate in Washington State, 22 of which are listed in Dun & Bradstreet's Million Dollar Data base. The 22 listed companies generated $64 million in sales, by themselves.
- On San Juan Island, there are 17 whale-watching and kayak-touring businesses. Countywide, tourism is a $156 million (2022$) industry.

Washington's commercial fisheries have historical, cultural, and economic significance to the state. Pollution from an oil spill and resulting impacts to wildlife would have lasting negative effects on the state's fisheries, but we are unable to quantify these at this time. In 2015, Washington's commercial fishing and seafood processing industries supported nearly 16,000 jobs with combined wages of over $1 billion and revenue of $12 billion (2022$).[67] Between 2009 and 2015, Washington exported nearly $10 billion in seafood, with the majority going to Canada, China, and Japan. Over half of Washington's counties support fisheries-related jobs with locations along the coastal, Puget Sound, and inland regions of the state.

[66] Southern Resident Killer Whale Chinook Salmon Initiative, 2015. Economic Value. https://srkwcsi.org/the-economic-value-of-southern-resident-killer-whales/

[67] Community Attributes, Inc. (CAI), 2017 "Washington State Maritime Sector Economic Impact Study." https://www.maritimefederation.com/uploads/2/9/9/6/29962189/cai.wmf.maritime_cluster_study_2017_update.2017_0413.pdf

A significant portion of the state's fishing industry shares Puget Sound with petroleum-related industries. Washington is the largest farmed and hatchery shellfish producer in the nation, with annual sales exceeding $123 million (2022$).[68] Although revenue from Washington's commercial salmon fisheries is not as significant as that from shellfish, the health of Washington's salmon population has economic implications for fisheries both in and outside the state, given that Canadian and Alaskan fisheries harvest 97% of the landed chinook salmon that spawn along Washington's coast.[69]

A large oil spill in Washington's marine or fresh waters could have significant and lasting impacts on fisheries in Washington and beyond. In the case of the Exon-Valdez Spill of 1989, traces of oil persisted in the environment for more than 10 years, with chronic direct and indirect ecosystem effects even after the significant cleanup effort.[70] Many of Washington's key fisheries species are highly sensitive to pollution from oil spills. Studies have shown that both shellfish and finfish may experience rapid population declines and lasting effects from exposure.[71]

In the years following the Deepwater Horizon (DWH) spill in 2010, shrimp landings in the Gulf of Mexico decreased by 27%. Louisiana's shrimp harvest decreased by nearly 60% and some estimates suggest that up to half of the state's annual oyster crop was lost, due in part to both the spill and remediation.[72] One estimate places the DWH spill's total economic impacts to the Gulf of Mexico commercial and mariculture fishing industries at nearly $7 billion between 2012 and 2020 (2022 dollars).[73] Exposure to even low levels of crude oil has been shown to negatively impact salmon and herring embryos, affecting reduced growth, reduced cardiorespiratory function, and altered cardiac structure. These physiological changes reduce the fitness and survivability of individuals as well as their ability to spawn.[74]

Impacts to fisheries from oil spills go beyond those related to direct ecosystem services, especially in the case of catastrophic and highly publicized oil-related disasters. Consumers, worried about the quality or health effects of eating seafood from areas near spills, may change their consumption patterns. In a public opinion poll following the DWH spill, Louisiana Seafood

[68] Pacific Shellfish Institute, 2019. "Where We Work" webpage. http://www.pacshell.org/washington.asp
[69] Pacific Fishery Management Council (PFMC), 2018. "Review of 2017 Ocean Salmon Fisheries." https://www.pcouncil.org/wp-content/uploads/2018/02/Review_of_2017_Ocean_Salmon_Fisheries_18Final.pdf
[70] Peterson, Charles H., S.D. Rice, J.W. Short, D. Esler, J.L. Bodkin, B.E. Ballachey, D.B. Irons, 2003. "Long-Term Ecosystem Response to the Exxon Valdez Oil Spill." Science. Volume 302.
[71] Ibid.
[72] Upton, Harold F. 2011. "The Deepwater Horizon Oil Spill and the Gulf of Mexico Fishing Industry." Congressional Research Service Report. https://fas.org/sgp/crs/misc/R41640.pdf
[73] Sumaila, Rashid U., A.M. Cisneros-Montemayor, A. Dyck, L. Huang, W. Cheung, J. Jacquet, K. Kleisner, V. Lam, A. McCrea-Strub, W. Swartz, R. Watson, D. Zeller, and D. Pauly., 2012. "Impact of the Deepwater Horizon well blowout on the economics of US Gulf Fisheries." Canadian Journal of Fisheries and Aquatic Science. Volume 69. https://www.nrcresearchpress.com/doi/pdf/10.1139/f2011-171
[74] Incardona, John P. M.G. Carls, L. Holland, T.L. Linbo, D.H. Baldwin, M.S. Myers, K.A. Peckm N. Tagal, S.D. Rice, and N.L. Scholz. 2015. "Very low embryonic crude oil exposures cause lasting cardiac defects in salmon and herring." Nature Scientific Reports. Volume 5 (13499).

and Promotion Board found that 70% of consumers expressed some concern about the health implications of consuming Gulf seafood and over 20% reduced their consumption of seafood.[75]

4.2.1.6.3 Avoided costs of smaller earthquakes

Quantified benefit estimates in this chapter (see previous sections) are based on a large regional earthquake affecting all facilities in the state. The seismic protections that are protective against a large earthquake are inherently also protective against smaller earthquakes. This means there are additional spill-avoidance benefits of the rule amendments that we could not quantify absent estimates of spill volume at different levels of seismic activity.

4.2.1.7 Seismic requirements – transfer pipelines

The rule amendments are likely to result in installation, design, permitting, construction, and maintenance of additional seismic protection measures at existing transfer pipelines or with seismic standards for new or changed pipelines. These improved protections result in a reduced likelihood of spills in the event of seismic activity. This, in turn, reduces the risk of impacts to the environment, public health, and property that result from spills and earthquakes.

Benefits associated with these rule amendments are assumed to be reflected to some degree in estimated benefits of avoided spill-related costs discussed above in Section 4.2.1.6.

4.2.1.8 Operations Manual submittal

As discussed in Chapter 3, the rule would result in minor time-related benefits or costs related to later or earlier submittal requirements.

To illustrate the difference in costs at different times, the table below shows the value of each $1 in present value terms depending on when it is spent. These costs are discounted across future and present using a 0.89% real discount rate[76] that accounts for inflation as well as the opportunity cost of having funds later instead of now.

Table 14: Timing impacts on costs

Timing change	Present Value	Percent Difference
1 month earlier	**$0.999**	**-0.07%**
2 months later	**$1.001**	**0.15%**

These amendments also result in the benefit of consistency across operations manual submittal requirements across Class 1 and 2 facilities, and across manuals submitted for initial approval and re-approval.

[75] CBS, 2011. "Survey Measures Post-Oil Spill Seafood Attitudes." https://www.cbsnews.com/news/survey-measures-post-oil-spill-seafood-attitudes/

[76] US Treasury Department, 2022. I bonds interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.

4.2.1.9 Substantial change

Defining a substantial change in oil handling capacity provides clarity and consistency for this requirement. This reduces overcompliance related to broader interpretation of substantial change, as well as reducing undercompliance related to a more limited interpretation of substantial change that results in failure to notify Ecology and update the manual. Depending on how facilities interpret the baseline requirements, this could result in increases or decreases of costs associated with notification and operations manual updates.

We could not quantify the degree to which over- or under-compliance with the rule occurs under the baseline. This is because the baseline language is not specific in defining what a substantial change is. We expect these costs or benefits to be minimal, as substantial change is already defined under Chapter 173-180 WAC for Class 1 facility Prevention Plans. This is likely to ultimately result in no impact, and function as a clarification, as facilities are likely to identify undefined baseline substantial change in the existing rule in a way that is consistent with other regulations.

4.2.1.10 Follow-up training

We do not expect benefits associated with these rule amendments, as compared to the baseline.

4.2.1.11 Training and Certification Program

These amendments would generate benefits of allowing additional time for Ecology to work with a facility to ensure any necessary changes are made to their program before beginning oil transfer operations.

The purpose of these rule amendments is to ensure training and certification programs are effective at preventing spills and achieving the goals of the law. Rather than allow for potential submission of insufficient plans, followed by potentially repeated interactions between Ecology and facilities, and the associated delays in protectiveness (and potentially delays transferring operations), the rule amendments allow for additional time for facilities to work with Ecology to ensure training and certification programs are complete.

If a significant change does occur at a facility, the rule amendments provide clarity as to when and how Prevention Plans are updated after significant changes occur at Class 1 or identifying changes to Ecology for Class 2 facilities.

4.2.1.12 Prevention Plan

These amendments result in benefits associated with:

- Having ready and predictable access to personnel contact information.
- Potential improved or more accurately documented understanding of secondary containment permeability, depending on interpretation of baseline requirements.
- Potential improved or more accurately documented understanding of spill risk and associated prevention and preparedness needs, depending on interpretation of baseline requirements.

- Additional time to work with Ecology to ensure Prevention Plans are sufficient, before plan expiration and before beginning operations, to avoid restrictions or delays affecting operations.

The purpose of prevention plans is to reduce the likelihood of spills affecting the environment, public health, and property. By ensuring that facilities have comprehensive personnel information and additional time to work with Ecology on their plans, as well as potentially improving understanding of secondary containment and spill risk (depending on how the baseline language is interpreted), these rule amendments reduce the likelihood of these spill impacts and cleanup costs (see discussion of these costs in section 4.2.1.6, above.)

4.2.1.13 Oil Transfer Response Plan

These amendments are likely to result in benefits of:

- Improved usability related to OTRP formatting.
- Clear commitment to use of the OTRP and providing access to drill records.
- Clear information about tanks, transfer rates, and transfer locations.
- Consistent and protective approach to transfers at locations not listed in the OTRP.

4.2.1.14 Drill requirements

These rule amendments result in benefits of more effective drills and their intended improvements to response in the event of a spill.

The purpose of these rule amendments is to ensure drills are effective in reducing the damages created by spills and achieving the goals of the law. The rule amendments will result in more effective drills, reducing potential costs to the environment, public health, and property (see discussion of these costs in section 4.2.1.6, above).

Class 2 facilities receiving drill credit for responding to a spill would also see a cost-savings of the avoided additional drill.

While we could not confidently estimate the frequency of Class 2 facilities receiving drill credit for responding to a spill, we identified that high-end costs of drills could range between $800 thousand and $1.2 million, depending on the:

- Length of the drill.
- Number and seniority of participating staff.
- Level of planning involved.
- Severity of the drill scenario.
- Disruption to normal revenue activities.
- Overhead costs, such as travel, meeting space, amenities, and potential pre-training.

Tabletop drills are less costly, as they typically last for less than two days and cost between $10 thousand and $100 thousand, depending on the:

- Number and seniority of participants.
- Amount of planning involved.
- Severity of the drill scenario.

4.2.1.15 Out of service requirements

These rule amendments will generate benefits of reduced spill risk associated with equipment that is out of use and may not be appropriately maintained. They also reduce potential contamination of materials that are disposed of or recycled, reducing risk of contamination at those facilities. While there are current voluntary options available under the baseline, they are not mandatory or comprehensive.

These rule amendments also reduce the likelihood that an out of service tank will leak and result in a spill to water (see associated costs discussed in Section 4.2.1.6, above).

4.2.2 Chapter 173-184 WAC (Vessels)

4.2.2.1 Recordkeeping

We expect these rule amendments to generate clear and comprehensive records supporting vessel oil transfer notice and containment.

As we could not confidently estimate the frequency and importance of the use of expanded records, we discuss this benefit qualitatively. By improving the information available in the event of a spill, or otherwise, the rule amendments facilitate improved planning and prevention that reduces the likelihood of future spill impacts.

4.2.2.2 Advance Notice of Transfer

For transfers with a change in timing greater than six hours, these rule amendments will result in the benefit of timely and accurate information about the transfer.

The additional information reported in the ANT brings these requirements into consistency with statutory baseline requirements and similar requirements in other rules. Ecology used discretion in including specific gravity, sulfur content, and viscosity. The rule is likely to generate benefits of comprehensive and consistent reporting requirements and information about the transfer. We note that currently all but one company submits this information electronically.

The purpose of ANT requirements is to identify transfers for inspectors to visit for compliance purposes and to help prepare for spills. By ensuring that ANTs include comprehensive and consistent information to achieve this goal – including specific gravity, sulfur content, and viscosity that inform necessary equipment and procedures in spill prevention and response, the rule amendments reduce the likelihood of spill cleanup costs and impacts on the environment, public health, and property (see discussion of these costs in section 4.2.1.6, above).

4.2.2.3 Prebooming requirements

These rule amendments provide protective thresholds for cases in which the Safe and Effective Threshold Determination Report does not contain the relevant thresholds and when lightering occurs. This will facilitate prebooming when it is safe and effective during lightering and transfers in infrequent locations.

4.2.3 Both rules (Facilities and vessels)

4.2.3.1 Definitions

Definitions do not have an impact in and of themselves but may impact benefits where they are used in rule requirements. Relevant benefits are discussed in the sections in which each requirement is discussed.

4.2.3.2 Noncompliance

These amendments are intended to facilitate use of corrective actions other than enforcement and penalties. By including conditional approval, compared to the baseline, they reduce potential costs and disruption associated with noncompliance, while maintaining the rule's protections for the environment, public health, and property.

4.2.3.3 Compliance schedules

The adopted compliance schedules allow entities time to come into compliance with new rule requirements. This results in a timing-related cost-savings by delaying compliance costs and allowing for more planning time.

We have reflected these potential cost savings resulting from flexibility in the cost estimates in this analysis to the degree possible. This includes assuming seismic requirements for tanks are implemented over time (see Chapter 3). If we instead assumed that all these costs are incurred immediately when the rule becomes effective, they could cost $0.4 million to nearly $22 million more in 20-year present value. If we assumed some costs were incurred immediately (engineering and overhead) and remaining costs were delayed to the full extent allowable under the rule amendments, they could cost $0.3 million to nearly $17 million less in 20-year present values.

Similarly, if we assumed costs associated with implementing seismic protection measures for transfer pipelines were incurred immediately when the rule becomes effective, they would cost $0.6 million to $1.8 million more in 20-year present value. And if we assumed some costs were incurred immediately and remaining costs were delayed to the full extent allowable under the rule amendments, they could cost $0.4 million to $1.4 million less in 20-year present value. We expect that in the case of these larger costs of the rule amendments, as well as in the case of smaller costs, facilities and vessels will consider costs at different times and the options and market pressures they face and choose the least-cost path to compliance.

4.2.3.4 Electronic submission

These amendments will result in reduced costs of notification and plan submittal.

We expect these costs to be small but greater than zero, and be associated with printing and either faxing or mailing physical copies of documents.

4.2.3.5 Conditional approval

Compared to the baseline, conditional approval as clearly defined under the rule amendments provides additional guidance in cases where the relevant plans do not initially meet requirements for approval. This reduces the potential costs and business disruption of plan disapproval or noncompliance resulting in enforcement or penalties. The rule amendments identify potential conditions (requirements) that need to be met under conditional approval, which align with meeting the requirements of the rules themselves while correcting plans.

4.2.3.6 Rate A prebooming and alternative measures

These rule amendments will result in benefits of consistent and evidence-supported booming of Rate A transfers whenever it is safe and effective to do so, with documentation of cases in which it is not.

The purpose of prebooming requirements is to facilitate use of boom when it is safe and effective to do so. By ensuring that prebooming and lack thereof have associated consistent and comprehensive information, the rule amendments reduce spill cleanup costs and impacts on the environment by requiring documentation behaviors that also prompt comprehensive understanding of the conditions under which transfers occur. (See discussion of spill-related costs in section 4.2.1.6, above).

4.2.3.7 Safe and Effective Threshold Determination Report

These rule amendments will result in benefits of clear methodology and planning regarding threshold values, boom attributes, deliverer abilities, determination basis, monitoring equipment, prebooming in cases where it is less effective, and alternative measures.

The purpose of the safe and effective threshold determination is to facilitate use of boom when it is both safe and effective to do so. By ensuring that methodology and planning include consistent and comprehensive information, the rule amendments reduce the likely severity of spills and their associated impacts to the environment, public health, and property (see discussion of spill-related costs in section 4.2.1.6, above) while accounting for the appropriateness of equipment, and for the safety of personnel.

4.2.3.8 Changes without material impact

These amendments do not impact rule requirements and are not expected to result in benefits beyond the benefit of facilitating compliance through clarity, reduced complexity and redundancy, and streamlined structure.

Chapter 5: Cost-Benefit Comparison and Conclusions

5.1 Summary of costs and benefits of the rule amendments

5.1.1 Costs

We estimated the quantifiable costs below, associated with the rule amendments.

Table 15: 20-year present value costs of the rule amendments

WAC Chapter	Amendment Category	Low-End Costs	High-End Costs
173-180	Recordkeeping	**$215,170**	**$215,170**
173-180	Oil transfer procedure	**$0**	**$226,891**
173-180	Seismic - Tanks	**$8,264,419**	**$452,797,211**
173-180	Seismic - Transfer pipelines	**$11,885,333**	**$36,878,708**
173-180	Follow-up training	**$0**	**$0**
173-180	Prevention plan	**$824,215**	**$824,215**
173-180	OTRP	**$215,170**	**$215,170**
173-180	Drills	**$69,700**	**$69,700**
173-180	Out of service	**$528,473**	**$1,056,946**
173-184	Recordkeeping	**$5,660**	**$5,660**
173-184	Prebooming	**$0**	**$0**
Both rules	ANT	**$186,373**	**$765,985**
Both rules	Prebooming	**$192,281**	**$384,561**
Both rules	SETD report	**$95,326**	**$95,326**
OVERALL	TOTAL COSTS	**$22,287,956**	**$493,341,378**

5.1.2 Benefits

While we could not fully quantify total present value benefits of the rule amendments, we estimated the quantifiable spill volumes that, if avoided as a result of the amendments, would fully offset costs. We also partially quantify or qualitatively discuss other benefits of avoided spills and improved preparedness.

Using estimates presented in an Oregon tank farm earthquake study,[77] based in recent review of relevant literature, we estimated a subset of corresponding costs of oil spills per gallon. Using those per-gallon costs, we estimated the following range of spill size that would offset estimated 20-year present value costs of the rule amendments. Recall that these avoided spill volumes would not manifest as a single avoided spill, but as a total avoided spill volume across all Class 1 facilities in the state (in the event of a large earthquake) and to a lesser degree all regulated entities (through improved preparedness). Note also that these avoided spills would not need to occur at the same time, and could be distributed over time across multiple seismic events.

[77] Ibid.

Table 16: Spill prevention needed to offset costs

Total 20-Year Present Value Cost	Cleanup, Habitat Restoration, and Navigation Cost (per gallon)	Total Equivalent Volume of Avoided Spills (gallons)	Percentage of Class 1 Storage Tank Volume
$22,287,956	**$1.66**	**13,396,006**	**0.90%**
$22,287,956	**$8.92**	**2,497,700**	**0.17%**
$493,341,378	**$1.66**	**296,519,058**	**19.92%**
$493,341,378	**$8.92**	**55,286,297**	**3.71%**

Avoided property value impacts

We estimated property value impacts between $86 million and $258 million resulting from large nearby spills at all Class 1 facilities. These impacts would vary depending on spill attributes, waterbody attributes, and property characteristics.

Avoided facility losses

Sightline Institute identified property values of over $2.4 billion at the five refinery properties in Washington.[78] If just these five (of 23) facilities avoided losing between 1% and 21% of their property value due to earthquake losses due to damaged storage tanks and transfer pipelines, due to improvements made under the rule amendments, it would offset our estimated total 20-year present value costs of the amendments.

To clean up spills and repair or replace equipment, Class 1 facilities would also likely shut down for some period of time. The degree of shutdown would depend on the degree of damage, and whether impacts to other parts of the facility were driving factors. For illustration, one article estimated a single shutdown event could, on average, cost a refinery $36.4 million.[79] Another estimated that depending on profit margins and oil prices, an average refinery could lose between $340,000 and $1.7 million per day of shutdown.[80] A third article places costs of downtime at a lower $2 million per episode.[81] GE estimated the hidden costs of lost or deferred production as $20,000 per day, and identified that 3.65 downtime days can cost organizations in the oil and gas industry over $5 million.[82]

We could not fully quantify benefits of the rule amendments in terms of reduced impact to:

- Cultural values and environmental justice.

[78] Sightline Institute, 2021. Oil Refinery Profits, Taxes, and Spending: A Primer. October 6, 2021.
[79] Kostyukov, A, A Kostyukov, and S Boichenko, 2020. Where transparency-driven value comes from. Digital Refining. January 2020.
[80] Gecko Robotics, 2021. The cost of Unplanned Downtime for Refineries. July 28,2021. Citing the American Institute of Chemical Engineers.
[81] Peleg, LA, 2021. Increase Refinery Availability by Predicting Failures Before They Happen. Precognize, a Samson Company. January 29,2021.
[82] GE Oil and Gas, 2016.The Impact of Digital on Unplanned Downtime.

- Surface water quality.
- Groundwater quality.
- Fisheries.
- Shellfisheries.
- Bird populations.
- Sea mammals.
- Endangered species.
- Animals consuming contaminated fish or shellfish.
- Recreational quality.
- Passive or non-use values for nature.
- Public health and safety:
    - Fire.
    - Air quality.
    - Toxic chemical exposure.
    - Drinking water contamination.
    - Subsistence or traditional food source contamination.
    - Evacuation.
    - Property damage and contamination.

Impacts to Tribes and Tribal resources

Oil spills have direct and indirect impacts to Tribal resources and lifeways, and many Class 1 facilities are located near Tribal lands. Direct impacts of spills include harm to resources such as fisheries and shellfisheries, through reduced access or ongoing contamination. These fisheries hold significant economic and subsistence values, and impacts can range from reduced market harvest, to reduced nutritional and calorie availability, to increased contamination of fish (and associated health impacts or foregone consumption), to reduced access to restoring and maintaining tribal lifeways for future generations. Spills create direct and indirect harm to land, waters, and animals (including fish and orcas) held in spiritual reverence and seen as family.

Population-wide values for avoiding spills

For the 2.8 million households in Washington, the collective willingness to pay to avoid spill impacts for a decade would be $259 million (2022$) for ten-year protection, or $492 million in 20-year present value for two payments ten years apart.

In 2004, Ecology funded extensive modeling of potential spills in Washington.[83] Adjusted for inflation, a single large spill in Washington could result in losses of over $15 billion (2022-dollars[84])

For the 2.8 million households in Washington, the collective annual willingness to pay for restoring the chinook population was estimated to be $137 million (2022$), or over $1 billion in present value over ten years.

Washington's commercial fisheries have historical, cultural, and economic significance to the state. Pollution from an oil spill and resulting impacts to wildlife would have lasting negative effects on the state's fisheries, but we are unable to quantify these at this time. In 2015, Washington's commercial fishing and seafood processing industries supported nearly 16,000 jobs with combined wages of over $1 billion and revenue of $12 billion (2022$).[85] Between 2009 and 2015, Washington exported nearly $10 billion in seafood, with the majority going to Canada, China, and Japan. Over half of Washington's counties support fisheries-related jobs with locations along the coastal, Puget Sound, and inland regions of the state.

5.2 Conclusion

We conclude, based on a reasonable understanding of the quantified and qualitative costs and benefits likely to arise from the rule amendments, as compared to the baseline, that the benefits of the rule amendments are greater than the costs.

[83] Environmental Research Consulting, 2004. Socioeconomic Cost Modeling for Washington State Oil Spill Scenarios. Prepared for Washington State Department of Ecology. July 2004.
[84] US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm
[85] Community Attributes, Inc. (CAI), 2017 "Washington State Maritime Sector Economic Impact Study." https://www.maritimefederation.com/uploads/2/9/9/6/29962189/cai.wmf.maritime_cluster_study_2017_update.2017_0413.pdf

Chapter 6: Least-Burdensome Alternative Analysis

6.1 Introduction

RCW 34.05.328(1)(c) requires Ecology to "…[d]etermine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection." The referenced subsections are:

(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements;

(b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule;

(c) Provide notification in the notice of proposed rulemaking under RCW 34.05.320 that a preliminary cost-benefit analysis is available. The preliminary cost-benefit analysis must fulfill the requirements of the cost-benefit analysis under (d) of this subsection. If the agency files a supplemental notice under RCW 34.05.340, the supplemental notice must include notification that a revised preliminary cost-benefit analysis is available. A final cost-benefit analysis must be available when the rule is adopted under RCW 34.05.360;

(d) 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.

In other words, to be able to adopt the rule, we are required to determine that the contents of the rule are the least burdensome set of requirements that achieve the goals and objectives of the authorizing statute(s).

We assessed alternative rule content, and determined whether it met the goals and objectives of the authorizing statute(s). Of the rule content that would meet the goals and objectives, we determined whether requirements chosen for inclusion in the rule amendments were the least burdensome to those required to comply with them.

6.2 Goals and objectives of the authorizing statute

The authorizing statutes for this rulemaking are:

- Chapter 88.46 RCW – Vessel Oil Spill Prevention and Response
- Chapter 90.56 RCW – Oil and Hazardous Substance Spill Prevention and Response

Their general goals and specific objectives include:

- Chapter 88.46 RCW, establishing:
    - Contingency plans

- Drills
- Emergency spill notification standards
- Response equipment standards
- Containment and recovery equipment standards
- Transfer volume reporting
- Inspections
- Planning standards
- Risk assessment
- Cost-sharing and umbrella coverage

- Chapter 90.56 RCW:
  - Ensuring the citizens of the state that the waters of the state will be protected from oil spills.
  - Achieving a zero spills strategy to prevent any oil or hazardous substances from entering waters of the state.
  - Establishing state agency expertise in marine safety and centralizing state activities in spill prevention and response activities.
  - Preventing spills of oil and promoting programs that reduce the risk of both catastrophic and small chronic spills.
  - Ensuring that responsible parties are liable, and have the resources and ability, to respond to spills and provide compensation for all costs and damages.
  - Providing for state spill response and wildlife rescue planning and implementation.
  - Supporting and complementing the federal Oil Pollution Act of 1990 and other federal law, especially those provisions relating to the national contingency plan for cleanup of oil spills and discharges, including provisions relating to the responsibilities of state agencies designated as natural resource trustees.
  - Interpreting and implementing the law in a manner consistent with federal law.
  - Providing broad powers of regulation to the Department of Ecology relating to spill prevention and response.
  - Providing for independent review on an ongoing basis the adequacy of oil spill prevention, preparedness, and response activities in this state.
  - Providing an adequate funding source for state response and prevention programs.
  - Maintaining the best achievable protection that can be obtained through the use of the best achievable technology and those staffing levels, training procedures,

and operational methods that provide the greatest degree of protection achievable.

6.3 Alternatives considered and why they were excluded

We considered the following alternative rule content and did not include it in the rule amendments for the reasons discussed in each subsection below.

- **Physical documents:** Maintaining the requirements for hard copies of reports, manuals, and plans to be submitted.
- **Ecology inspections:** Requiring universal inspections by Ecology.
- **Approved standards:** Allowing facilities to propose other standards approved by Ecology throughout the rule, without being explicit about the protectiveness of the standards.
- **Significant change:** Considering a more stringent definition of significant change in oil handling capacity.
- **Environmental conditions:** Requiring equipment that is appropriate for "above average" environmental conditions.
- **Nonfloating oil:** Requiring facilities to include nonfloating oil identification in their Prevention Plans.
- **Ownership change:** Maintaining current requirements for facilities and vessels that change ownership.
- **Compliance deadlines:** Requiring facilities and vessels to comply with the rule amendments on the effective date of the rule, or in shorter timeframes.
- **Prebooming timeframe:** Relaxing the timeframe requirements for prebooming after a spill if an oil transfer is not already preboomed.
- **Prebooming and transit conditions:** Allowing oil transfers not to be preboomed if weather conditions while transiting to a transfer location are not safe.
- **Universal prebooming:** Prohibiting transfers that are not preboomed.
- **Universal prebooming when safe and effective:** Requiring all oil transfers, regardless of transfer rate, to preboom when it is safe and effective to do so.
- **Universal prebooming without worst-case resources:** Prohibiting transfers that are not preboomed unless resources are staged for a worst-case spill.
- **Reevaluation of weather conditions:** Not including new requirements to reevaluate weather conditions during an oil transfer to determine if a transfer can be preboomed after it has begun.
- **Prebooming simultaneous transfers:** Not requiring prebooming of a concurrent transfer after the transfer of the volatile product is complete.

- **Verifiable data:** Requiring facilities to use data that can be independently verifiable for safe and effective threshold determinations.
- **Limiting transfer locations:** Prohibiting transfers at locations without approved Safe and Effective Threshold Determination Reports.
- **Reduced safe and effective data requirements:** Not requiring oil transferers to submit data that supports their safe and effective threshold values for each transfer location.
- **Daylight-only transfers without prebooming:** Prohibiting transfers that occur outside of daylight hours, particularly if it is not safe and effective to preboom.
- **Universal prebooming in anchorage areas without worst-case resources:** Prohibiting transfers in anchorage areas when they are not preboomed and there are not resources available for a worst-case spill.
- **Worst-case resources for transfers in anchorage areas:** Prohibiting transfers in anchorage areas when resources are not available for a worst-case spill (regardless of whether they are preboomed).
- **USCG timeframe for advance notice:** Removing the timeframe set forth by the US Coast Guard (USCG) Captain of the Port from the advance notice requirements for delivering vessels.
- **Refined product advance notice:** Including refined products in the updated advance notice requirements to capture heavy fuel types and other potentially non-floating oils, other than crude oil.
- **Listing transfer locations:** Not requiring mobile facilities to list all of their transfer locations in their Class 2 Oil Transfer Response Plans.
- **Unannounced drills:** Requiring unannounced drills for Class 2 facilities.
- **Proof of certification:** Requiring certified personnel to carry proof of training program certification during oil transfer operations.
- **Reduced secondary containment requirements for permeability:** Reducing the requirements for facilities with regards to permeability data for each secondary containment system.
- **Expanded secondary containment requirements:** Requiring that secondary containment be capable of containing 100% of the capacity of all storage tanks in a containment area.
- **Risk assessment process:** Requiring facilities to use a prescribed process for risk assessments, such as Process Hazard Analysis or Hazard and Operability analysis.
- **More stringent seismic protection measures:** Requiring specific seismic protection measures that are the most protective, regardless of cost.
- **Less stringent seismic protection measures:** Reducing seismic protection requirements.

- **Out of service definition:** Considering a storage tank or transfer pipeline out of service after 120 days.
- **Temporary decommissioning:** Allowing facilities to meet less stringent decommissioning requirements when decommissioning is temporary.

6.3.1 Physical documents

Ecology considered maintaining the requirements for hard copies of reports, manuals, and plans to be submitted. This would have imposed additional burden on facilities. Electronic copies of documents meet the planning and protectiveness goals and objectives of the statutes and are easier to search or make available upon request.

6.3.2 Ecology inspections

Ecology considered requiring universal inspections by Ecology outside of already required inspections. This would have been more burdensome to facilities, due to the time needed to plan for and participate in inspections. Due to limited resources, this alternative could also endanger Ecology's ability to best meet the prevention goals of the authorizing statutes. Ecology has limited resources and prioritizes inspections where they are the most needed and can provide the greatest benefit. Ecology inspects each Class 1 and 4 facility annually, inspects regulated oil transfers at Class 1, 2, and 3 facilities, and approves Training and Certification programs for Class 1 and 2 facilities through on-site inspections.

6.3.3 Approved standards

Ecology considered allowing facilities to propose other standards approved by Ecology throughout the rule, without being explicit about the protectiveness of the standards. This could endanger our ability to meet the protectiveness goals and objectives of the authorizing statutes, as the baseline rule does not include explicit statements that other proposed standards must be at least as protective as other measures approved by Ecology and could imply that Ecology may allow less-protective standards to be used.

6.3.4 Significant change

Ecology considered using a less-than-5% change in oil handling capacity as the definition of a significant change. This would have imposed added burden on facilities by increasing the changes that would be considered significant, in a manner inconsistent with how significant change is used elsewhere. A 5% change in oil handing capacity is currently considered a significant change for the purpose of Prevention Plan update requirements. However, for Operations Manuals, the language is less clear and requires an update to the manual if there is a substantial change to oil handling capacity. Ecology is updating this language to 5% for clarity and for consistency with the Prevention Plan requirements.

6.3.5 Environmental conditions

Ecology considered requiring prebooming equipment that is appropriate for “above average” environmental conditions. This would have been more burdensome while not meeting the goals and objectives of the statutes. For prebooming, facilities and vessels are required to use equipment that is appropriate for the environmental conditions in which it will be used. Requiring equipment appropriate for ‘above average’ conditions reduces clarity in the rule. The phrase ‘above average’ is difficult to define and could add confusion to regulated entities. The intent of the rule amendments with respect to prebooming is to add clarity to the rule and to improve prebooming performance. Part of this clarity is specifying that the equipment used should match expected environmental conditions for the transfer location.

6.3.6 Nonfloating oil

Ecology considered requiring facilities to include nonfloating oil identification in their Prevention Plans. This requirement would be more burdensome to covered parties by requiring them to identify each oil type based on their nonfloating oil identification. This alternative would also not have served to better meet the protectiveness goals and objectives of the authorizing statutes, as the current requirement to provide oil type in Prevention Plans gives Ecology sufficient information to consider the potential for the types of oil at the facility to sink or submerge in water.

6.3.7 Ownership change

Ecology considered maintaining baseline requirements for facilities and vessels that change ownership. This alternative would not have met the protectiveness goals of the authorizing statutes, as it pertains to how a new owner plans for, is familiar with, and documents oil transfer operations. In these rule amendments, Ecology has clarified that any facility that is sold to a new owner or operator, would be considered a new owner or operator and would therefore need to meet all applicable requirements of the rule prior to beginning operations in the state. While a change in owner/operator was previously considered a significant change to specific plans in the rule, the rule amendments explicitly call out new facilities and change in owner or operator of a facility as needing to meet all of the requirements in rule before beginning operations. This strengthens the requirements on new owners/operators, which is necessary to ensure new owners/operators are meeting the state’s regulatory requirements. A new owner or operator of any facility would need to submit a new plan, manual, etc. regardless of whether or not they own another facility in Washington State. If a company has a plan for multiple facilities, they will still need to submit a new plan to Ecology, specific to the newly acquired facility.

6.3.8 Compliance deadlines

Ecology considered requiring facilities and vessels to comply with the rule amendments on the effective date of the rule, or in shorter timeframes. This would have imposed additional burden

on covered parties. Based on the scope of the rule amendments and anticipated effort and cost to implement some of these measures, Ecology has evaluated the rule changes and has staggered deadlines for regulated entities to meet the deadlines to reduce the cost and the burden on facilities. While some of the new requirements will be expected to be met on the effective date of the rule or soon after, others that may require new equipment or time to properly implement are given more time to comply with the new requirements. These compliance schedules also reduce the degree of disruption to oil transfer operations by providing flexibility in timing of construction or new equipment installation.

6.3.9 Prebooming timeframe

Ecology considered relaxing the timeframe requirements for prebooming after a spill if an oil transfer is not already preboomed. This would not have met the protectiveness goals of the authorizing statutes. Ecology understands industry's concerns that when it is not safe to preboom, meeting the 1-hour requirement to preboom after a spill can be challenging. However, this requirement is in the baseline rule, which also provides flexibility in compliance: If an entity has been unable to meet this existing requirement, they could propose an Equivalent Compliance Plan for Ecology to review. Additionally, while it may not be safe and effective to preboom, if there is a spill, the spiller could bring in larger response equipment and vessels that could operate safely in the conditions.

6.3.10 Prebooming and transit conditions

Ecology considered allowing oil transfers not to be preboomed if weather conditions while transiting to a transfer location are not safe. This would not have met the protectiveness goals and objectives of the authorizing statutes. The safe and effective requirements are based on whether it is safe and effective to preboom at the transfer location. We do not give direction to the deliverer on how to get equipment to the transfer location to preboom when it is safe and effective to do so. Options deliverers could use to ensure prebooming can take place, when possible, include staging equipment in advance or using larger vessels to transit to the transfer location.

6.3.11 Universal prebooming

Ecology considered prohibiting transfers that are not preboomed. This would have imposed additional burden on covered parties. Ecology's rules focus on the safe and effective thresholds, which determine whether or not prebooming can occur, and ensure that prebooming and/or alternative measure requirements are being met. The rules are designed so delivering vessels and facilities can use the safe and effective thresholds to determine which environmental conditions (e.g., wind speed, water current, wave height) allow for prebooming to occur, not to determine whether or not an oil transfer can occur. The rules also do not prescribe the times or locations for transfers to occur. Ecology does have contingency plans, oil transfer response plans, and alternative measure requirements in place in the event that a spill does occur. This allows us to have a rapid, aggressive, and well-coordinated response to a potential oil spill.

Note that the rule amendments would strengthen transfer requirements through changes to advance notice, transfer information provided, prebooming requirements, and reporting requirements.

6.3.12 Universal prebooming when safe and effective

Ecology considered requiring all oil transfers, regardless of transfer rate, to preboom when it is safe and effective to do so. This would have imposed additional burden on covered parties, as well as not meeting the goals and objectives of the authorizing statute regarding appropriate requirements relative to risk. Removing the categories of 'Rate A' and 'Rate B' transfers to have the same requirements for all transfer rates would likely increase the number of preboomed transfers. However, under RCW 88.46.165(1) Ecology must scale requirements to risk and has done so by having more stringent requirements for transfers at a rate of over 500 gallons per minute.

Due to the slower transfer rate of Rate B transfers, if a spill were to occur, the volume of oil spilled during the reaction time to shut down a Rate B then compared to a Rate A transfer is less. Additionally, the regulations still require other oil spill prevention measures in place for Rate B transfers, outside of the requirement to preboom. The types of entities transferring at a Rate B are different than a Rate A as well – they are usually smaller vessels and mobile facilities, and changes in the requirements would be burdensome particularly to those smaller entities.

6.3.13 Universal prebooming without worst-case resources

Ecology considered prohibiting transfers that are not preboomed unless resources are staged for a worst-case spill. This would have imposed additional burden on covered parties. Ecology's rules focus on the safe and effective thresholds, which determine whether or not prebooming can occur, and ensure that prebooming and/or alternative measure requirements are being met. The rules are designed so delivering vessels and facilities can use the safe and effective thresholds to determine which environmental conditions (e.g., wind speed, water current, wave height) allow for prebooming to occur, not to determine whether or not an oil transfer can occur. The rules also do not prescribe the times or locations for transfers to occur. Ecology does have contingency plans, oil transfer response plans, and alternative measure requirements in place in the event that a spill does occur. This allows us to have a rapid, aggressive, and well-coordinated response to a potential oil spill. Note that the rule amendments would strengthen transfer requirements through changes to advance notice, transfer information provided, prebooming requirements, and reporting requirements.

6.3.14 Reevaluation of weather conditions

Ecology considered not including clarity for an existing requirement to reevaluate weather conditions during an oil transfer to determine if a transfer can be preboomed after it has begun. This would not have met the protectiveness goals and objectives of the authorizing statute. In the 15 years of implementing these rules, Ecology has observed instances when weather that is forecasted that would preclude booming does not materialize. The adopted

changes require deliverers to reevaluate conditions during the transfer, and preboom if conditions are appropriate. When conditions continue to preclude prebooming, deliverers are required to report this to Ecology with an updated Boom Reporting Form. Early drafts of the rule language required reevaluation every 2 hours for transfers at anchor and every 6 hours for transfers at a terminal. Stakeholders requested Ecology review these timelines. Ecology determined that requiring reevaluation every 4 hours for transfers at anchor and 6 hours for transfers at a terminal strengthens prebooming requirements while considering impacts to the regulated community.

6.3.15 Prebooming simultaneous transfers

Ecology considered not clarifying that prebooming is required of a concurrent transfer after the transfer of the volatile product is complete. This would not have met the protectiveness goals and objectives of the authorizing statutes. Baseline requirements do not require prebooming of an oil transfer if multiple products are being transferred simultaneously and if one of those products is highly volatile. Sometimes, the transfer of a volatile product is complete before the transfer of other products has been completed. This transfer should be boomed if it safe and effective to do so. To strengthen rule requirements around prebooming and to ensure that transfers that can be preboomed are appropriately preboomed, the rule amendments clarify that the transfer should be preboomed if there are at least 3 hours remaining in the transfer of the nonvolatile product (if safe and effective to do so). Early rule drafts required this to occur if 2 hours remained in the transfer, but the time was extended to 3 hours based on stakeholder feedback about the time it takes to deploy boom.

6.3.16 Verifiable data

Ecology considered requiring facilities and vessels to use data that can be independently verified, in their safe and effective threshold determinations. This would have imposed additional burden on covered parties and could potentially reduce the effectiveness of the rule in meeting statutory protectiveness goals by affecting on-site information gathered in a timely fashion. Ecology acknowledges that some information used to make a decision to preboom is not independently verifiable. Some of this information is observed from personnel with eyes on the water, providing accurate, real-time information about current environmental conditions. It is not feasible for all information submitted to be independently verifiable by Ecology, so the requirement to do so would be unnecessarily burdensome on facilities and vessels transferring oil.

6.3.17 Limiting transfer locations

Ecology requires companies that deliver oil to develop Safe and Effective Threshold Determination Reports for each location where a transfer may take place. However, Ecology recognizes that occasionally companies need to conduct an oil transfer in a location where they do not normally conduct them. The baseline rules do not explicitly address these situations. Instead of prohibiting transfers at locations without approved Safe and Effective Threshold

Determination Reports, which would have imposed additional burden on covered parties, the rule amendments instead specify requirements for transfers in unlisted locations and lightering situations.

Ecology thinks it is important to include clarification requirements around these types of transfers, so guidance is clear for these situations. Prebooming is still required in these situations, and we have adopted safe and effective values for companies to use in these situations where other safe and effective values are not available for a transfer. Ecology selected these values to encourage prebooming of transfers in locations where companies do not typically conduct oil transfers, and for transfers where the delivering vessel may be less familiar with local conditions. Additionally, if a deliverer has frequent transfers at a location not covered, they are required to update their Safe and Effective Threshold Determination Report to include the new location.

6.3.18 Reduced safe and effective data requirements

Ecology considered not requiring facilities and vessels transferring oil to submit data that supports their safe and effective threshold values for each transfer location. This would not have met the comprehensive information necessary to meet the protectiveness goals of the authorizing statutes. The rule amendments include an additional requirement for delivering facilities and vessels to provide data that supports their safe and effective threshold values, and requires the data to cover multiple years and include data that is recent enough to reflect existing conditions and that has been collected no more than 10 years from the date of the Safe and Effective Threshold Determination Report.

While regulated parties have communicated that they find this burdensome, and believe it is redundant to have each submitter research and submit separate research on these parameters, Ecology included this requirement in the rule to ensure the data being used by companies to determine when it is safe and effective to preboom is up to date. Ecology can work with companies to help identify data sources, if companies are having trouble identifying sources to use.

6.3.19 Daylight-only transfers without prebooming

Ecology considered prohibiting transfers that occur outside of daylight hours, particularly if it is not safe and effective to preboom. This would have imposed an additional burden on covered parties. Ecology's rules focus on the safe and effective thresholds, which determine whether or not prebooming can occur, and ensure that prebooming and/or alternative measure requirements are being met. The rules are designed so delivering vessels and facilities can use the safe and effective thresholds to determine which environmental conditions (e.g., wind speed, water current, wave height) allow for prebooming to occur, not to determine whether or not an oil transfer can occur. The rules also do not prescribe the times or locations for transfers to occur. Ecology rules require Class 1 and 2 facilities to maintain Operations Manuals that describe how oil transfers are conducted. Ecology does have contingency plans, oil transfer response plans, and alternative measure requirements in place in the event that a spill does

occur. This allows us to have a rapid, aggressive, and well-coordinated response to a potential oil spill. Note that the rule amendments would strengthen transfer requirements through changes to advance notice, transfer information provided, prebooming requirements, and reporting requirements.

6.3.20 Universal prebooming in anchorage areas without worst-case resources

Ecology considered prohibiting transfers in anchorage areas when they are not preboomed and there are not resources available for a worst-case spill. This would have imposed an additional burden on covered parties. Ecology's rules focus on the safe and effective thresholds, which determine whether or not prebooming can occur, and ensure that prebooming and/or alternative measure requirements are being met for oil transfers at anchorage areas. The rules are designed so delivering vessels and facilities can use the safe and effective thresholds to determine which environmental conditions (e.g., wind speed, water current, wave height) allow for prebooming to occur, not to determine whether or not an oil transfer can occur. The rules also do not prescribe the times or locations for transfer to occur. Ecology does have contingency plans, oil transfer response plans, and alternative measure requirements in place in the event that a spill does occur. This allows us to have a rapid, aggressive, and well-coordinated response to a potential oil spill. Note that the rule amendments would strengthen transfer requirements through changes to advance notice, transfer information provided, prebooming requirements, and reporting requirements.

6.3.21 Worst-case resources for transfers in anchorage areas

Ecology considered prohibiting transfers in anchorage areas when resources are not available for a worst-case spill (regardless of whether they are preboomed). This would have imposed additional burden on covered parties. Ecology's rules focus on the safe and effective thresholds, which determine whether or not prebooming can occur, and ensure that prebooming and/or alternative measure requirements are being met for oil transfers at anchorage areas. The rules are designed so delivering vessels and facilities can use the safe and effective thresholds to determine which environmental conditions (e.g., wind speed, water current, wave height) allow for prebooming to occur, not to determine whether or not an oil transfer can occur. The rules also do not prescribe the times or locations for a transfer to occur. Ecology does have contingency plans, oil transfer response plans, and alternative measure requirements in place in the event that a spill does occur. This allows us to have a rapid, aggressive, and well-coordinated response to a potential oil spill. Note that the rule amendments would strengthen transfer requirements through changes to advance notice, transfer information provided, prebooming requirements, and reporting requirements.

6.3.22 USCG timeframe for advance notice

Ecology considered removing the baseline timeframe set forth by the U.S. Coast Guard (USCG) Captain of the Port from the advance notice requirements for delivering vessels. This would

have imposed additional burden on covered parties. The rule amendments retain the USCG Captain of the Port requirement, as well as adopt an additional 24-hour requirement, to leave flexibility in the rule language in case the timeframe set forth by the Captain of the Port ever changes. While that current timeframe is four hours, this could change, and this flexibility would remain in the regulation to account for that possibility. We also want to ensure our federal partners have useful information since they can access our advance notice of transfer system.

6.3.23 Refined product advance notice

Ecology considered including refined products in the advance notice requirements to capture heavy fuel types and other potentially non-floating oils, other than crude oil. This would have imposed additional burden on covered parties, as it would have been inconsistent with information, we receive for other modes of oil transport under Chapter 173-185 WAC. The rule does not include other oils and refined petroleum products because Ecology has a good understanding of their characteristics, and can use this information to support the goals and objectives of the authorizing statutes. However, for crude oil, characteristics of the oil can be more variable depending on the gravity, sulfur content, and viscosity.

6.3.24 Listing transfer locations

Ecology considered not requiring mobile facilities to list all their transfer locations in their Class 2 Oil Transfer Response Plans. This would not have met the statewide protectiveness goals and objectives of the authorizing statues. It is important for Ecology and the USCG to know the locations where oil transfers occur throughout the state. This allows us to understand risk as well as potential resource gaps. This information is also important because it allows us to ensure facilities are meeting the alternative measure requirements. The rule amendments would also add requirements for infrequent transfer locations.

6.3.25 Unannounced drills

Ecology considered requiring unannounced drills for Class 2 facilities. This would have been a burden on facilities, and is not necessary to meet the goals and objectives of the authorizing statutes.

Ecology already has the authority to conduct unannounced drills at our discretion when it is necessary to assess strengths and weaknesses of oil spill plans.

This rulemaking is clarifying and expanding on the drill program requirements for Class 2 facilities to now include notification, deployment, tabletop, worst case, and unannounced drills. Ecology's current drill program reinforces a continuous improvement and lessons learned culture for the maintenance of preparedness of our regulated community. By not requiring regular unannounced drills, Ecology has flexibility to conduct them as necessary to ensure compliance with requirements.

6.3.26 Proof of certification

Ecology considered keeping the baseline requirement for certified personnel to carry proof of training program certification during oil transfer operations. This had increased burden on covered parties without improving our ability to meet the goals and objectives of the authorizing statutes. Ecology removed the requirement for staff to carry proof of certification under the Training and Certification Program during oil transfers, but we do require personnel to either carry or have readily available evidence of completion of the Training and Certification Program. Individuals conducting transfers already carry their ID and a TWIC card, so the requirement was unnecessarily burdensome.

6.3.27 Reduced secondary containment requirements for permeability

Ecology considered reducing the requirements for facilities with regards to permeability data for each secondary containment system. This would not have met the protectiveness goals and objectives of the authorizing statutes. For secondary containment permeability, facilities may not have specific permeability information for a majority of their property, making the requirements difficult to achieve. Ecology will work with each facility on a case-by-case basis to help facilities meet the requirements, and data requirements will vary depending on containment type used.

Depending on the existing secondary containment in place at facilities, requirements will potentially result in the facility having to improve the permeability characteristics of their secondary containment. Ecology is not prescribing specific changes to facilities to meet permeability requirements, and expects facilities will select options that consider both costs and effectiveness. However, not clarifying the requirements of the rules in this area would not achieve the objectives in statute.

6.3.28 Expanded secondary containment requirements

Ecology considered requiring that secondary containment be capable of containing 100% of the capacity of all storage tanks in a containment area. This would have imposed additional burden on covered parties and is potentially unfeasible without significant impact to facility structure and operations. If Ecology were to require that secondary containment systems be able to contain the full volume of all tanks in a containment area, rather than just the volume of the largest tank, there would not be sufficient space in the containment areas. Facilities would either need to expand their footprint to accommodate the same storage capacity or would need to reduce storage capacity. This would be overly burdensome on facilities.

However, the rule amendments improve environmental protection by specifying that secondary containment must be capable of containing oil throughout the entire system, including walls and floors; be constructed to prevent any discharge from a primary containment system from escaping the containment system before cleanup occurs; and by specifying that secondary containment systems must be capable of containing 100% of the capacity of the largest tank including sufficient freeboard for stormwater.

Finally, in conjunction with other rule amendments, there is likely to be reduced likelihood of spills in situations that affect multiple (or all) tanks, such as seismic activity.

6.3.29 Risk assessment process

Ecology considered requiring facilities to use a prescribed process for risk assessments, such as Process Hazard Analysis or a Hazard and Operability Study. This would have imposed additional burden on covered parties. In this rulemaking, Ecology initially prescribed the method required for risk analyses that must be conducted as part of a facility's Prevention Plan. While this would meet the objective of the authorizing statute, telling facilities how to conduct the analysis could be overly burdensome. Instead, Ecology drafted rule language that requires facilities to use a formal process to analyze risk of spills to waters of the state and includes the criteria that must be met using the formal process. The amended rule describes what the formal process must do, without directing facilities to use a specific process. This provides flexibility to facilities on how they meet the new requirements, without reducing the ultimate stringency of the requirement regarding risk assessment quality.

6.3.30 More stringent seismic protection measures

Ecology considered requiring specific seismic protection measures that are the most protective, regardless of cost. This would have imposed additional burden on covered parties and may have limited the ability to implement seismic protection measures most appropriate and effective for site-specific attributes and support the protectiveness goals of the authorizing statutes. Requiring seismic anchors for tanks, or that facilities install a piling foundation, rather than having the option for flexible connections, could be cost prohibitive for some facilities. Instead, there is flexibility in the requirements for storage tanks and transfer pipelines. Ecology is allowing facilities to choose from several different options in the rule so they can select protection measures that are appropriate and effective for the facility. We also allow facilities to propose other measures to Ecology for approval, provided that the measures equal or exceed the protection of those listed in the rule. By having a long phase-in date for these requirements, facilities will be able to evaluate their risk assessments and determine what measures are most appropriate to implement.

The rule amendments' intent is to improve protection of storage tanks and transfer pipelines against seismic events. We provide flexibility in the rule language so other measures are an option, and understand that some equipment at facilities may already meet the requirements.

6.3.31 Less stringent seismic protection measures

Ecology also considered reducing seismic protection requirements. This would not have met the protectiveness goals of the authorizing statutes. Ecology has provided options in the rule for facilities to choose from to meet these requirements, rather than prescribing specific measures that may be the costliest to implement. Additionally, the new requirements have a phase-in date of 10 years or the date of the next inspection for that equipment (whichever is later). This allows facilities to plan ahead for the changes and conduct their risk assessments to determine

what measures are needed and most appropriate. This also allows them to schedule changes concurrent to inspections, when equipment would be taken out of service temporarily already, to minimize additional disruption to operations.

6.3.32 Out of service definition

Ecology considered defining a storage tank or transfer pipeline as out of service after 120 days of being offline. This would have imposed additional burden on covered parties. Storage tanks and transfer pipelines may be taken offline for longer than 120 days for maintenance and inspections but would not be considered out of service to the facility and would return to use thereafter. Ecology's intent is not to include inspections and maintenance because we recognize that would be overly burdensome to facilities. The rule amendments define 'out of service' to be a longer period of one year, which is unlikely to capture maintenance and inspections. Ecology also provided flexibility by allowing facilities to either maintain the storage tank or transfer pipeline as if it were in service (and meet all rule requirements) or meet the decommissioning requirements in 173-180-910(1)(b).

6.3.33 Temporary decommissioning

Ecology considered allowing facilities to meet less stringent decommissioning requirements when decommissioning is temporary. This would not have met the protectiveness goals and objectives of the authorizing statutes. To address situations where facilities may have planned service on applicable equipment at a future date (potentially far into the future), Ecology defines 'out of service' as one year or more. If maintenance is scheduled and a storage tank or transfer pipeline will be out of service for longer than one year, even if not permanent, the decommissioning requirements in rule will apply (including the option of maintaining the tank or pipeline as though it was in active use). This allows the rule amendments to maintain protectiveness while allowing flexibility and planning time.

6.4 Conclusion

After considering alternatives to the rule's contents, within the context of the goals and objectives of the authorizing statute, we determined that the adopted rule amendments represent the least-burdensome alternative of possible rule contents meeting the goals and objectives.

Chapter 7: Regulatory Fairness Act Compliance

7.1 Introduction

The Regulatory Fairness Act (RFA; RCW 19.85.070) requires Ecology to perform a set of analyses and make certain determinations regarding the rule amendments. This chapter presents the:

- Analysis of relative compliance cost burden.
- Consideration of lost sales or revenue.
- Cost-mitigating elements of the rule, if required.
- Small business and local government consultation.
- Industries likely impacted by the rule.
- Expected impact on jobs.

A small business is defined by the RFA as having 50 or fewer employees, at the highest ownership and operator level. Estimated compliance costs are determined as compared to the baseline (the regulatory environment in the absence of the rule amendments, limited to existing federal and state requirements). Analyses under the RFA only apply to costs to "businesses in an industry" in Washington State. This means the impacts, for this part of our analyses, are not evaluated for government agencies.

7.2 Analysis of relative compliance cost burden

We calculated the estimated costs to comply with the rule amendments, based on the 20-year present value (PV) costs estimated in Chapter 3 of this document. In this section, we estimate compliance costs per employee.

As the rule amendments affect various classes of facility and vessel companies, we subdivided costs based on amendment type, and calculated 20-year present value costs per employee for the relevant facility and/or vessel group. Based on cost estimates in Chapter 3, we estimated the following compliance costs per employee. Amendment categories listed as "n/a" either only affect large businesses (since these requirements are exempt from the RFA under RCW 19.85.025(4)) or are not expected to result in costs as compared to the baseline. Class 1 facilities are excluded from averages, as they are all large businesses.

Table 17: 20-year present value compliance costs per employee

WAC Chapter	Amendment Category	Average Employment – Small Businesses	Average Employment – Largest 10% of Businesses	PV Cost per Employee – Small Businesses (low)	PV Cost per Employee – Small Businesses (high)	PV Cost per Employee – Largest 10% of Businesses (low)	PV Cost per Employee – Largest 10% of Businesses (high)
173-180	Recordkeeping	**9**	**13,060**	**$23,492**	**$23,492**	**$16**	**$16**
173-180	Oil transfer procedure	**14**	**31,500**	**$0**	**$15,882**	**$0**	**$7**
173-180	Seismic – Tanks	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
173-180	Seismic – Transfer pipelines	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
173-180	Follow-up training	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
173-180	Prevention plan	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
173-180	OTRP	**17**	**31,500**	**$1,236**	**$1,236**	**$1**	**$1**
173-180	Drills	**17**	**31,500**	**$4,100**	**$4,100**	**$2**	**$2**
173-180	Out of service	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
173-184	Recordkeeping	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
173-184	Prebooming	**n/a**	**n/a**	**$0**	**$0**	**$0**	**$0**
Both rules	ANT	**16**	**23,166**	**$11,648**	**$47,874**	**$8**	**$33**
Both rules	Prebooming	**16**	**23,166**	**$12,018**	**$24,035**	**$8**	**$17**
Both rules	SETD report	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

We conclude that the rule amendments are likely to have disproportionate impacts on small businesses, and therefore Ecology must include elements in the rule to mitigate this disproportion, as far as is legal and feasible.

We note, however, that our estimates of costs per employee are based on overall ranges of compliance costs, and on average employment. This means they do not reflect the potential reduced need for additional compliance activities at small businesses if business size is correlated with number of transfers performed; if small businesses perform fewer transfers, their total costs (and therefore costs per employee) will be lower. Similarly, large businesses with more staff will perform a larger number of transfers, and their costs will be higher than estimated above. We nonetheless chose to retain estimates based on averages, as we were not able to model costs specific to each likely impacted business and its relevant transfer activities, and the above estimates reflect a conservative approach to identifying potential disproportionate impacts on small businesses (i.e., the approach is more likely to overestimate disproportion than to underestimate it).

7.3 Loss of sales or revenue

Businesses that would incur costs could experience reduced sales or revenues if the rule amendments significantly affect the prices of the goods they sell. The degree to which this could happen is strongly related to each business's production and pricing model (whether additional lump-sum costs would significantly affect marginal costs), as well as the specific attributes of the markets in which they sell goods, including the degree of influence each firm has on market prices, as well as the relative responsiveness of market demand to price changes.

We used the REMI E3+ model for Washington State to estimate the impact of the rule amendments on directly affected markets, accounting for dynamic adjustments throughout the economy. The model accounts for: inter-industry impacts; price, wage, and population changes; and dynamic adjustment of all economic variables over time.

Many of the likely affected businesses operate in a variety of industries. To reflect this, we ran multiple REMI model scenarios, varying assumptions about which industries incur costs, as well as the size of costs (based on ranges estimated in Chapter 3), to develop a range of estimated impacts across the state. Across 24 modeled scenarios:

- The lowest impacts resulted from low-end estimates of costs, and most costs being borne by the petroleum manufacturing industry except those costs isolated by their applicability to wholesale or water transportation industries. This resulted in statewide aggregate impacts of:
    - Output losses of $4 million in 2023, rising to $21 million by 2027, and falling thereafter.
    - No significant impact to prices.
- The highest impacts resulted from high-end estimates of costs, and most costs being borne by the petroleum manufacturing industry, with a higher proportion of costs that

are applicable to them being borne by marinas and marine services. This resulted in statewide aggregate impacts of:

- Output losses of $84 million in 2023, rising to $0.5 billion by 2027, and falling thereafter.
- Small impacts on prices, up to a maximum of 0.04% in 2027.

We note that baseline state output is forecast to be over $1.2 trillion by 2027, of which the highest impact scenario impact of $0.5 billion is approximately 0.04%.

7.4 Action taken to reduce small business impacts

The RFA (19.85.030(2) RCW) states that:

"Based upon the extent of disproportionate impact on small business identified in the statement prepared under RCW 19.85.040, the agency shall, where legal and feasible in meeting the stated objectives of the statutes upon which the rule is based, reduce the costs imposed by the rule on small businesses. The agency must consider, without limitation, each of the following methods of reducing the impact of the proposed rule on small businesses:

a) Reducing, modifying, or eliminating substantive regulatory requirements;

b) Simplifying, reducing, or eliminating recordkeeping and reporting requirements;

c) Reducing the frequency of inspections;

d) Delaying compliance timetables;

e) Reducing or modifying fine schedules for noncompliance; or

f) Any other mitigation techniques including those suggested by small businesses or small business advocates."

We considered all of the above options, the goals and objectives of the authorizing statutes (see Chapter 6), and the scope of this rulemaking. We limited compliance cost-reduction methods to those that:

- Are legal and feasible.
- Meet the goals and objectives of the authorizing statute.
- Are within the scope of this rulemaking.

Ecology was not able to reduce substantive regulatory requirements beyond eliminating requirements that were not effective in achieving the objectives of the authorizing statutes, as they are necessary to implement the statutes, but multiple elements of the rule amendments make the rules more consistent across the regulatory requirements faced by covered facilities and vessels, reducing the compliance burden of undertaking different actions or making different assumptions in compliance. This includes clear and streamlined processes and reporting requirements (including electronic submission of reports, manuals, and plans).

During this rulemaking, Ecology also considered requiring universal inspections by Ecology outside of already required inspections. This would have increased compliance burden (costs) and was excluded from the rule amendments.

Ecology delayed compliance timetables, using compliance schedules, allowing businesses additional time to take necessary actions to comply with the rule amendments.

Regarding noncompliance, the rule amendments clarify and streamline conditional approval requirements. This allows businesses to avoid noncompliance, to continue operations and avoid business losses, and take necessary actions to meet the objectives of the authorizing statutes.

As discussed in the Least-Burdensome Alternative Analysis (see Chapter 6), Ecology also considered the following alternative rule contents, but did not include it in the rule amendments due at least in part to the additional compliance burden it would impose:

- A smaller percentage to define substantive change in oil handling capacity.
- Requiring prebooming equipment that is appropriate for "above average" environmental conditions.
- Requiring facilities to include nonfloating oil identification in their Prevention Plans.
- Prohibiting transfers that are not preboomed.
- Requiring all oil transfers, regardless of transfer rate, to preboom when it is safe and effective to do so.
- Prohibiting transfers that are not preboomed unless resources are staged for a worst-case spill.
- Requiring facilities and vessels to use data that can be independently verified, in their safe and effective threshold determinations.
- Limiting transfer locations to locations with approved Safe and Effective Threshold Determination Reports.
- Prohibiting transfers that occur outside of daylight hours.
- Prohibiting transfers in anchorage areas when they are not preboomed and there are not resources available for a worst-case spill.
- Prohibiting transfers in anchorage areas when resources are not available for a worst-case spill, regardless of prebooming.
- Removing the baseline timeframe set forth by the U.S. Coast Guard (USCG) Captain of the Port from the advance notice requirements for delivering vessels.
- Including refined products in the advance notice requirements.
- Requiring unannounced drills for Class 2 facilities.
- Keeping the baseline requirement for certified personnel to carry proof of training program certification.

- Expanding secondary containment requirements.
- Requiring facilities to use a prescribed process for risk assessments.
- More stringent seismic protection measures.
- Defining a storage tank or transfer pipeline as out of service after 120 days of being offline.

7.5 Small business and government involvement

We involved small businesses and local governments in its development of the rule amendments, using:

- Notice of rulemaking ("Proposal Statement of Inquiry"; form CR-101), emails, updates, and workshop invitations directly to likely impacted entities, as well as entities that would not be impacted by the rule amendments:[86]
    - 23 Class 1 facilities.
    - Western States Petroleum Association.
    - 27 Class 2 facilities.
    - 6 Class 3 facilities.
    - 77 Class 4 facilities.
    - 43 entities regulated by Chapter 173-184 WAC.
    - 75 stakeholders and interested parties, including Tribes, trade associations, municipalities, other states, and non-governmental organizations representing environmental, safety, and health interests.
    - 69 ports.
- Notice of rulemaking directly to state, regional, and local emergency and air quality bodies:
    - 43 local emergency planning committees.
    - 17 state emergency response commissions.
    - 7 clean air agencies.
- Notice of rulemaking directly to 63 associations and organizations representing:
    - Environmental concerns.
    - Engineers.

[86] Note that facility counts by class are based on classification at the time of outreach. Class 2, 3, and 4 facilities counts differ in the rest of the document, as they reflect facility class counts at the time of rule adoption.

- Businesses.
- Small businesses.
- Public health.
- Counties.
- Emergency response.
- Ports.
- Transportation.

7.6 North American Industry Classification System (NAICS) codes of impacted industries

The rule amendments likely impact the following industries, with associated NAICS codes. We note many likely impacted businesses have more than one NAICS code and have reflected all identified NAICS codes. NAICS definitions and industry hierarchies are discussed at https://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2017.

- 2111 Oil and Gas Extraction
- 2131 Support Activities for Mining
- 2211 Electric Power Generation, Transmission and Distribution
- 2379 Other Heavy and Civil Engineering Construction
- 2389 Other Specialty Trade Contractors
- 3117 Seafood Product Preparation and Packaging
- 3211 Sawmills and Wood Preservation
- 3219 Other Wood Product Manufacturing
- 3241 Petroleum and Coal Products Manufacturing
- 3366 Ship and Boat Building
- 4244 Grocery and Related Product Merchant Wholesalers
- 4247 Petroleum and Petroleum Products Merchant Wholesalers
- 4412 Other Motor Vehicle Dealers
- 4413 Automotive Parts, Accessories, and Tire Retailers
- 4451 Grocery and Convenience Retailers
- 4831 Deep Sea, Coastal, and Great Lakes Water Transportation
- 4832 Inland Water Transportation
- 4872 Scenic and Sightseeing Transportation, Water

- 4883 Support Activities for Water Transportation
- 4885 Freight Transportation Arrangement
- 5416 Management, Scientific, and Technical Consulting Services
- 5417 Scientific Research and Development Services
- 5614 Business Support Services
- 5615 Travel Arrangement and Reservation Services
- 5621 Waste Collection
- 5622 Waste Treatment and Disposal
- 5629 Remediation and Other Waste Management Services
- 7139 Other Amusement and Recreation Industries
- 7211 Traveler Accommodation
- 7212 RV (Recreational Vehicle) Parks and Recreational Camps

7.7 Impact on jobs

We used the REMI E3+ model for Washington State to estimate the impact of the rule amendments on jobs in the state, accounting for dynamic adjustments throughout the economy.

The rule amendments would result in transfers of money within and between industries, as compared to the baseline. The modeled impacts on employment are the result of multiple small increases and decreases in employment, prices, and other economic variables across all industries in the state.

Many of the likely affected businesses operate in a variety of industries. To reflect this, we ran multiple REMI model scenarios, varying assumptions about which industries incur costs, as well as the size of costs (based on ranges estimated in Chapter 3), to develop a range of estimated impacts across the state. Across 24 modeled scenarios:

- The lowest impacts resulted from low-end estimates of costs, and most costs being borne by the petroleum manufacturing industry except those costs isolated by their applicability to wholesale or water transportation industries. This resulted in statewide aggregate employment loss of:
    - 10 full-time employee (FTE) equivalents in 2023.
    - 43 FTE equivalents in 2027, falling thereafter.
- The highest impacts resulted from high-end estimates of costs, and most costs being borne by the petroleum manufacturing industry, with a higher proportion of costs that are applicable to them being borne by marinas and marine services. This resulted in statewide employment losses of:

- 195 FTE equivalents in 2023.
- 1,042 FTE equivalents in 2027, falling thereafter.

We note that baseline state employment is forecast to be over 5 million FTE equivalents by 2027, of which the highest impact scenario impact is approximately 0.02%.

References

Carson, RT, MB Conaway, WM Hanemann, JA Krosnick, RC Michael, S Presser, 2004. Valuing Oil Spill Prevention: A case study of California's Central Coast. Kluwer Academic Publishers, 2004.

CBS, 2011. "Survey Measures Post-Oil Spill Seafood Attitudes." https://www.cbsnews.com/news/survey-measures-post-oil-spill-seafood-attitudes/

Clallam County Assessor, 2022. Tax Parcel Map, Clallam County GIS Portal. https://clallam-county-portal-clallam.hub.arcgis.com/apps/eeeb8174a731485fbd0961322ef91185/explore

Clark County Assessor, 2022. MapsOnline, GIS. https://gis.clark.wa.gov/mol/?siteid=PropertyFinder

Community Attributes, Inc. (CAI), 2017 "Washington State Maritime Sector Economic Impact Study." https://www.maritimefederation.com/uploads/2/9/9/6/29962189/cai.wmf.maritime_cluster_study_2017_update.2017_0413.pdf

Duke Energy, 2017. Decommissioning Cost Estimate Study. April 19, 2017.

ECONorthwest, 2022. Impacts of Fuel Releases from the CEI Hub, Due to a Cascadia Subduction Zone Earthquake.

Environmental Research Consulting, 2004. Socioeconomic Cost Modeling for Washington State Oil Spill Scenarios. Prepared for Washington State Department of Ecology. July 2004.

Franklin County Assessor, 2022. TerraScan MapSifter. https://franklinwa-mapsifter.publicaccessnow.com/defaultHTML5.aspx

GE Oil and Gas, 2016.The Impact of Digital on Unplanned Downtime.

Gecko Robotics, 2021. The cost of Unplanned Downtime for Refineries. July 28,2021. Citing the American Institute of Chemical Engineers.

Grays Harbor County Assessor, 2022. TerraScan MapSifter. https://graysharborwa-mapsifter.publicaccessnow.com/defaultHTML5.aspx

Incardona, John P. M.G. Carls, L. Holland, T.L. Linbo, D.H. Baldwin, M.S. Myers, K.A. Peckm N. Tagal, S.D. Rice, and N.L. Scholz. 2015. "Very low embryonic crude oil exposures cause lasting cardiac defects in salmon and herring." Nature Scientific Reports. Volume 5 (13499).

King County Assessor, 2022. Parcel Viewer. https://gismaps.kingcounty.gov/parcelviewer2/

Kostyukov, A, A Kostyukov, and S Boichenko, 2020. Where transparency-driven value comes from. Digital Refining. January 2020.

Lane, T and C Babbitt, 2016. Commercial renovation costs 2017: With RSMeans data. Gordian RSMeans Data, 2016.

Pacific Fishery Management Council (PFMC), 2018. "Review of 2017 Ocean Salmon Fisheries." https://www.pcouncil.org/wp-content/uploads/2018/02/Review_of_2017_Ocean_Salmon_Fisheries_18Final.pdf

Pacific Shellfish Institute, 2019. "Where We Work" webpage. http://www.pacshell.org/washington.asp

Peleg, LA, 2021. Increase Refinery Availability by Predicting Failures Before They Happen. Precognize, a Samson Company. January 29,2021.

Peterson, Charles H., S.D. Rice, J.W. Short, D. Esler, J.L. Bodkin, B.E. Ballachey, D.B. Irons, 2003. "Long-Term Ecosystem Response to the Exxon Valdez Oil Spill." Science. Volume 302.

Phelan, M, 2016. Assemblies cost with RSMeans data 2017. R S Means Co

Pierce County Assessor, 2022. PublicGIS. https://matterhornwab.co.pierce.wa.us/publicgis/

Plotner, SC, C Babbitt, AC Charest, C Elsmore, and J Gomes, 2016. Building construction costs with RSMeans Data 2017. R S Means Co.

Shigenaka, G, 2015. Biological Effects of Crude Oil Spills. Presentation to the National Academy of Sciences. March 10, 2015.

Sightline Institute, 2021. Oil Refinery Profits, Taxes, and Spending: A Primer. October 6, 2021.

Skagit County Assessor, 2022. iMap. https://www.skagitcounty.net/Maps/iMap/

Southern Resident Killer Whale Chinook Salmon Initiative, 2015. Economic Value. https://srkwcsi.org/the-economic-value-of-southern-resident-killer-whales/

Sumaila, Rashid U., A.M. Cisneros-Montemayor, A. Dyck, L. Huang, W. Cheung, J. Jacquet, K. Kleisner, V. Lam, A. McCrea-Strub, W. Swartz, R. Watson, D. Zeller, and D. Pauly., 2012. "Impact of the Deepwater Horizon well blowout on the economics of US Gulf Fisheries." Canadian Journal of Fisheries and Aquatic Science. Volume 69. https://www.nrcresearchpress.com/doi/pdf/10.1139/f2011-171

Upton, Harold F. 2011. "The Deepwater Horizon Oil Spill and the Gulf of Mexico Fishing Industry." Congressional Research Service Report. https://fas.org/sgp/crs/misc/R41640.pdf

US Bureau of Labor Statistics, 2021. May 2021 State Occupational Employment and Wage Estimates, Washington. https://www.bls.gov/oes/current/oes_wa.htm

US Bureau of Labor Statistics, 2022. Consumer Price Index, Inflation Calculator. Consumer Price Index for all urban consumers. https://www.bls.gov/data/inflation_calculator.htm

US Federal Emergency Management Agency, 1992. Earthquake Resistant Construction of Gas and Liquid Fuel Pipeline Systems Serving, or Regulated by, the Federal Government. FEMA-233, July 1992.

US Treasury Department, 2022. I bond interest rates. Historic average September 1998 through November 2022. https://treasurydirect.gov/savings-bonds/i-bonds/i-bonds-interest-

rates/#:~:text=The%20composite%20rate%20for%20I,through%20April%202023%20is%206.89%25.

WA Department of Ecology, 2022. Advance Notice of Transfer. Number of submissions per year 2018 – present.

WA Department of Ecology, 2022. Advance Notice of Transfer, number of submissions from likely covered vessels.

WA Department of Natural Resources, 2022. New Study Details Tsunami Impacts of Magnitude 9.0 Earthquake to Olympic Peninsula. https://www.dnr.wa.gov/news/new-study-details-tsunami-impacts-magnitude-90-earthquake-olympic-peninsula#:~:text=The%20last%20Cascadia%20rupture%20was,in%20the%20next%2050%20years.

Whatcom County Assessor, 2022. Tax Parcel Viewer. https://www.arcgis.com/apps/webappviewer/index.html?id=f2f8eaa500b04f54948c680bb280129f

White, EM and D Goodding, 2013. Spending and Economic Activity from Recreation at Oregon State Park Properties – Columbia River Gorge Management Unit. Oregon State University. June 2013. https://www.oregon.gov/oprd/PLANS/docs/scorp/2013-2018_SCORP/Gorge_Economic_Impact%20Report.pdf

Zama, S, H Nishi, K Hatayama, M Yamada, H Yoshihara, and Y Ogawa, 2012. On Damage of Oil Storage Tanks due to the 2011 off the Pacific Coast of Tohoku Earthquake (Mw9.0), Japan. 15 WCEE, Lisboa 2012.

Appendix A: Administrative Procedure Act (RCW 34.05.328) Determinations

A. RCW 34.05.328(1)(a) – Clearly state in detail the general goals and specific objectives of the statute that this rule implements.

See Chapter 6.

B. RCW 34.05.328(1)(b) –

1. Determine that the rule is needed to achieve the general goals and specific objectives of the statute.

See chapters 1 and 2.

2. Analyze alternatives to rulemaking and the consequences of not adopting this rule.

Rule revisions are needed to address legislative direction that came out of the 2019 session. This rulemaking implements section 8 of Engrossed Substitute House Bill (ESHB) 1578, passed in 2019 and codified in RCW 88.46.165. Ecology received funding through the Legislature for the 2021-23 biennium to support this rulemaking and align both rules with the updated state law.

State law does not require rulemaking to implement these new reporting requirements. Ecology could implement these requirements without incorporating them into the rule. However, we received legislative direction through funding to support this rulemaking. Without rulemaking, applicable sections in Chapter 173-180 WAC and Chapter 173-184 WAC would not align with the new requirements in state law.

Additionally, since these rules have not been updated since 2007, revisions to both rules are needed. Over the years, spill risk continues to change, and new risks emerge. Ecology's rules must adapt to address these risks and ensure we are requiring the necessary safeguards to prevent, prepare for, and respond to spills. Ecology has worked closely with the regulated community to implement and enforce the requirements of these two rules. Rule amendments are essential to address gaps identified and provide stronger oil spill protection to the waters of the state. Ecology utilized this opportunity to make necessary updates to both rules.

Please see the Least Burdensome Alternative Analysis, Chapter 6 of this document, for discussion of alternative rule content considered.

C. RCW 34.05.328(1)(c) - A preliminary cost-benefit analysis was made available.

When filing a rule proposal (CR-102) under RCW 34.05.320, Ecology provides notice that a preliminary cost-benefit analysis is available. At adoption (CR-103 filing) under RCW 34.05.360, Ecology provides notice of the availability of the final cost-benefit analysis.

D. RCW 34.05.328(1)(d) – Determine that probable benefits of this 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.

See Chapters 1 – 5.

E. RCW 34.05.328 (1)(e) - Determine, after considering alternative versions of the analysis required under RCW 34.05.328 (b), (c) and (d) that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated in Chapter 6.

Please see Chapter 6.

F. RCW 34.05.328(1)(f) - Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law.

The amended rules do not conflict with or violate the requirements of another federal or state law. Ecology has broad authority under Chapter 90.56 RCW and Chapter 88.46 RCW to adopt rules for oil spill prevention and preparedness. All rule amendments are complementary with current state and federal laws and rules.

Advance Notice of Oil Transfer Reporting Requirements

During the 2019 legislative session, new provisions were added to Chapter 88.46 RCW that expanded advance notice of oil transfer reporting requirements for Class 1, 2, and 3 facilities and for vessels delivering oil in bulk on or over waters of the state. These rule amendments align with RCW 88.46.165, which includes reporting information regarding the region per bill of lading, gravity as measured by API gravity, and the type of crude oil. These reporting requirements do not conflict with federal regulations, as 33 C.F.R. Part 156 does not include the specific reporting requirements that are included in the rule amendments.

The rule amendments update the timeframe in which delivering vessels must notify Ecology prior to an oil transfer operation. Notifications must now be submitted to Ecology at least twenty-four hours prior to the oil transfer operation or within the time frame set forth by the applicable United States Coast Guard (USCG) Captain of the Port, whichever is greater. 33 C.F.R. Part 156.118 states that the Captain of the Port may require notification of an oil transfer "at least 4 hours before it begins…". The navigable waters of Washington State are within two USCG Sectors, Sector Puget Sound and Sector Columbia River. The Captains of the Port for Coast Guard Sector Puget Sound and Coast Guard Sector Columbia River may require notifications four hours before certain transfers begin. This amendment does not conflict with federal requirements as it meets current Coast Guard requirements and allows for compliance if the timeframe for reporting in either Coast Guard Sector changes in the future.

In addition, under 33 C.F.R. Part 156.215, the federal requirement for advance notice of lightering operations is twenty-four hours in advance of arrival in the lightering location. This aligns with the updated twenty-four hours advance notice included in the rule amendments, although it is specifically for lightering operations. 33 C.F.R. Part 156.215 also

includes “in the event the estimated time of arrival in the lightering location or zone changes by more than six hours, the Master, owner or agent of each vessel to be lightered must advise the Captain of the Port of this change as soon as possible.” This is consistent with the rule amendments, in which we require the advance notice information to be updated if the start time of the transfer changes by more than six hours.

Prebooming Requirements for Rate A Transfers and Safe and Effective Threshold Determination Report Requirements

The rule amendments ask for more information to clarify the safe and effective threshold determination for Rate A deliveries and submission requirements for Ecology’s Boom Reporting Form. They also expand on the content requirements for the Safe and Effective Threshold Determination Report. The rule amendments for Chapter 173-184 WAC also clarify prebooming and safe and effective threshold determination requirements for lightering operations, and for short-term transfer locations.

RCW 88.46.160 establishes rulemaking authority for oil spill standards for oil transfer, refueling and bunkering, and lightering operations. The statute requires standards for containment measures during these operations, and to have response equipment readily available if a spill does occur. These rule amendments do not violate federal regulations for oil transfers, as 33 C.F.R. Part 156 could require prebooming, but no U.S. Coast Guard port currently requires prebooming in the U.S.

Oil Transfer Response Plans and Drill Program Requirements

The rule amendments expand upon drill program requirements already required by Ecology. These rule amendments align with the federal National Preparedness for Response Exercise Program (NPREP) guidelines (33 C.F.R. Part 154.1055) these facilities already follow, and do not violate federal regulations.

Ecology expanded the requirements for Class 2 facility Oil Transfer Response Plans to include federal requirements and provide clarity for these requirements. The requirements align with federal requirements in 33 C.F.R. Part 154 Subpart F. There are slight differences from federal requirements, to clarify and expand upon existing requirements, but they do not require facilities to violate the current federal requirements.

Out of Service Requirements

Ecology established out of service requirements for Class 1 facility storage tanks and transfer pipelines. Ecology has broad authority under RCW 90.56.220 to adopt standards for transfer, storage, and handling of oil. Ecology reviewed federal and state requirements during development of these new requirements to ensure they are complementary with the USCG and Environmental Protection Agency (EPA) requirements. There are some requirements that expand upon federal requirements. However, these rules do not conflict with or violate the current federal requirements. In the amended rule, any storage tanks or transfer pipelines at a Class 1 facility that have been placed in caretaker status, as is defined in 33 C.F.R. Part 154 or that have been permanently closed as defined in 40 C.F.R. Part 112, are considered decommissioned. Ecology also reviewed Minnesota requirements for out of

service aboveground storage tanks (Minn. R. 7151.8100-8500) when developing the rule amendments. Ecology's definition of out of service tanks and the requirements in the rule amendments is similar to Minnesota's.

Seismic Protection Measures

The rule amendments for Chapter 173-180 WAC establish seismic protection measures for Class 1 facility storage tanks and transfer pipelines. Federal requirements for oil handling facilities (40 C.F.R. Part 112 and 33 C.F.R. Part 154) do not address seismic risks. Ecology has authority under RCW 90.56.220(1) to adopt rules that "ensure that the best achievable protection of the public health and the environment is employed at all times." Best achievable protection, as defined in RCW 90.56.010(1), is attained using best achievable technology. Best achievable technology, as defined in RCW 90.56.010(2) means "the technology that provides the greatest degree of protection taking into consideration (a) processes that are being developed, or could feasibly be developed, given overall reasonable expenditures on research and development, and (b) processes that are currently in use." In identifying "best achievable technology," Ecology "shall consider the effectiveness, engineering feasibility, and commercial availability of the technology" (RCW 90.56.010(2)).

These seismic protection measures represent best achievable technology. Ecology consulted with other state agencies, reviewed building codes, industry standards, and literature describing seismic impacts on industrial facilities to assess the effectiveness and feasibility of the measures required. In 2022, Oregon's Legislature passed a bill to require bulk oil or liquid fuels terminals to conduct seismic risk assessments and develop seismic risk mitigation implementation plans. The Oregon Department of Environmental Quality (DEQ) will also develop rules for a seismic risk mitigation program. Our rule amendments also incorporate new requirements for Class 1 facilities to inspect storage tanks for seismic design standards and to include the results of these inspections in their Prevention Plan risk analyses.

Secondary Containment Permeability and Facility Spill Risk Analysis

The rule amendments expand on Class 1 facility Prevention Plan content requirements for secondary containment soil permeability to protect waters of the state. The amendment specifies information that must be included in Prevention Plans and describes how Ecology will determine whether secondary containment meets existing requirements in Chapter 173-180 WAC. Federal regulations (40 C.F.R. Part 112) state that secondary containment must be 'sufficiently impervious to contain oil', but do not specify criteria.

The rule amendments expand on Class 1 facility Prevention Plan content requirements for the facility's spill risk analysis. Amendments clarify what criteria should be included in the formal process to evaluate the facility's oil spill risk to waters of the state. Ecology's requirements expand on, but do not contradict federal requirements. Federal regulations, 40 C.F.R. Part 112, require facilities to include in their Spill Prevention, Control, and Countermeasure (SPCC) Plan "a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each type of major

equipment failure". Additionally, in facility response plans, owners or operators must analyze the probability of a discharge occurring at the facility: "This analysis shall incorporate factors such as oil discharge history, horizontal range of a potential discharge, and vulnerability to natural disaster, and shall, as appropriate, incorporate other factors such as tank age. This analysis will provide information for developing discharge scenarios for a worst-case discharge and small and medium discharges and aid in the development of techniques to reduce the size and frequency of discharges."

G. RCW 34.05.328 (1)(g) – Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law.

These rules do not impose more stringent performance requirements on private entities than on public entities. Chapter 173-180 WAC and Chapter 173-184 WAC apply to all entities subject to the rules regardless of ownership or operator. There are both private and public entities regulated under these rules.

H. RCW 34.05.328 (1)(h) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter.

Yes

- If **yes**, the difference is justified because of the following:

  ☐ (i) A state statute explicitly allows Ecology to differ from federal standards.

  ☒ (ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated in Chapter 6.

Advance Notice of Oil Transfer Reporting Requirements

Rule amendments are needed to align both rules with statutory changes made in the 2019 legislative session. Through ESHB 1578, codified in RCW 88.46.165, the Legislature expanded advance notice of oil transfer reporting requirements for Class 1, 2, and 3 facilities and for vessels delivering oil in bulk on or over waters of the state. These reporting requirements expand upon federal regulation, as 33 C.F.R. Part 156 does not include the specific reporting requirements that are include in the rule amendments. The rule amendments include the following changes:

- Region of origin is a new requirement added to statute after the passing of ESHB 1578. Ecology included this requirement to align with statute. This information provides Ecology responders with helpful information regarding the potential characteristics of the crude oil.
- Gravity and sulfur content information provides consistency with other crude oil reporting data collected by Ecology through requirements in Chapter 173-185 WAC for reporting of oil movement by rail and pipeline.
- Gravity (relative density) can be reported as specific gravity or as measured by standards developed by the American Petroleum Institute. Gravity provides

information about how dense the oil is compared to water. Density information of the oil provides the response community with information about how likely the oil may sink or submerge in the water column if a spill were to occur.
- Sulfur can be toxic and corrosive and is a breathing hazard in certain forms (hydrogen sulfide). Data on sulfur content of the oil is helpful for emergency responders.
- Viscosity of the oil is important because it tells us how easily the oil can move or flow, or its resistance to flow. This is important from a response readiness perspective. Knowing how the oil will interact with the environment or water in which it spilled into, provides responders with information about how they can best respond and cleanup the spilled oil.

Updating the timeframe in which delivering vessels must submit their advance notice of oil transfer requirements to Ecology still allows for consistency with the USCG's requirements, but also allows both Ecology and USCG inspectors time to prepare for and conduct oil transfer inspections. Oil transfer inspections provide enhanced protection to the waters of the state. Updating the timeframe requirement to twenty-four hours or the timeframe set forth by the applicable USCG Captain of the Port, whichever is greater, does not conflict with 33 C.F.R. Part 156.

Prebooming Requirements for Rate A Transfers and Safe and Effective Threshold Determination Report Requirements

Prebooming requirements for Rate A transfers and updates to requirements in the Safe and Effective Threshold Determination Report expand upon federal regulations for oil transfers (33 C.F.R. Part 156) because federal regulations do not address prebooming requirements. The amendments included in both rule amendments for Rate A deliverers are necessary for oil transfer operations to implement lessons learned through years of implementation and provide oil spill prevention improvements in areas where gaps have been identified.

Oil Transfer Response Plans and Drill Program Requirements

Expansion of Oil Transfer Response Plan requirements for Class 2 facilities provides an additional layer of oil spill preparedness. By including a complete description of response plan requirements in the rule amendments, Ecology provides clarification regarding expectations for Class 2 facilities, ensuring a rapid response to spills. This is important because oil transfers for Class 2 facilities occur throughout the state and sometimes away from spill response infrastructure. With these rule amendments, we will better understand where Class 2 transfers are occurring and how the plan holder will ensure response equipment is deployed if there is a spill. In addition, routine exercise of response equipment and notification procedures strengthens the state's readiness when a spill occurs. The amended rule includes the following differences from the federal regulation (33 C.F.R. Part 154 Subpart F):

- Require an authorized owner, operator, or designee to submit a binding agreement, binding the plan submitter to its use. This addition provides added assurance of

compliance and is consistent with Chapter 173-182 WAC's binding agreement requirements.

- Clarify response equipment resources in WAC 173-180-217 and 173-180-220 through 173-180-222 are available through a written agreement with a state approved primary response contractor (PRC), letter of intent, mutual aid agreement, contract or other approvable means; or facility owned equipment. This initial response equipment exceeds federal requirements; however, Ecology's prebooming and alternative measure requirements have been in place since 2007.
- Expands the federal regulation by requiring a description of personnel responsibilities to mitigate a spill for each transfer location with required initial containment and recovery equipment in WAC 173-180-217 and WAC 173-180-220 through 173-180-222.
- Provides clarity to the federal regulation's requirement to include a "physical description of the facility" (33 C.F.R. Part 154.1035(e)(1)(i)). The rule requires a description of the number of tanks and tank capacities on the largest truck or container.
- Provides clarity to the federal regulation's requirement to include the "facility's location described in a manner that could aid both a reviewer and a responder in locating the specific facility covered by the plan" (33 C.F.R. Part 154.1035(a)(2)). The rule requires a list of all oil transfer locations as a street address or GPS coordinates.
- Expands the federal regulation by requiring a form to document initial and follow-up spill notifications.

Out of Service Requirements

Establishing out of service requirements for Class 1 facility storage tanks and transfer pipelines provides oil spill prevention measures during the entirety of a facility's life cycle. The rule amendments provide Class 1 facilities an option to decommission storage tanks and transfer pipelines that are out of service, in lieu of continuing to maintain them as if they were still in service. The decommissioning requirements in the rule amendments include elements that are not required by federal regulations (33 C.F.R. Part 154 and 40 C.F.R. Part 112). However, the rule amendments also state that facilities complying with the requirements of either of these two federal regulations will be considered in compliance with Ecology's rule. These additional elements are more protective of waters of the state, such as requirements to certify storage tanks as gas-free, air-gap oil piping from storage tanks, and de-energize electrical devices, which are not required by 40 C.F.R. Part 112, and a requirement to physically remove marine transfer hoses from the dock, which is not required by 33 C.F.R. Part 154.

Seismic Protection Measures

Establishing requirements for seismic protection measures for storage tanks and transfer pipelines will ensure safeguards are in place to help prevent spills during seismic events. Federal requirements for oil handling facilities (40 C.F.R. Part 112 and 33 C.F.R. Part 154) do not address seismic risks.

Secondary Containment Permeability and Facility Spill Risk Analysis

Expansion of requirements for Class 1 facility Prevention Plans is necessary to address gaps identified in oil spill prevention standards. Specifying criteria for reporting secondary containment permeability will allow facilities and Ecology to determine whether they are meeting existing standards. Providing criteria for facility spill risk analyses will improve the quality and consistency of risk assessments. Federal regulations (40 C.F.R. Part 112) state that secondary containment must be 'sufficiently impervious to contain oil', but do not specify criteria.

Ecology has broad authority under Chapter 90.56 RCW and Chapter 88.46 RCW to adopt rules for oil spill prevention and preparedness, which can include adopting regulations that are more stringent or broader in scope than federal requirements.

I. RCW 34.05.328 (1)(i) – Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same subject matter.

Federal and state agencies that regulate Class 1, 2, 3, and 4 facilities, or vessels delivering oil in bulk on or over waters of the state covered by these rules include the United States Coast Guard, Environmental Protection Agency, Oregon Department of Environmental Quality, California Department of Fish and Wildlife Office of Spill Prevention and Response, and Alaska Department of Environmental Conservation Spill Prevention and Response.

Ecology has notified and solicited input from these federal and state agencies, Tribes, and other stakeholders throughout this rulemaking process.