



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# **NWRO Addendum to Quality Assurance Project Plan**

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Nonpoint Pollution Investigations  
in Western Washington – Little  
Indian Slough, Padilla Bay Water  
Quality Assessment

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This QAPP addendum was approved to begin work in October 2021. It was finalized and approved for publication in May 2022.

### Original Quality Assurance Project Plan:

Ultican, S., J. Riedmayer, and M. Gleason. 2021. Quality Assurance Project Plan: Nonpoint Pollution Investigations in Western Washington. Publication 21-10-027. Washington State Department of Ecology, Olympia.

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# NWRO Addendum to Quality Assurance Project Plan

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## Nonpoint Pollution Investigations in Western Washington Little Indian Slough, Padilla Bay Water Quality Assessment

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January 2022

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EAP: Environmental Assessment Program

# Contents

Assessment .....	1
Publication Information .....	2
Contact Information .....	2
NWRO Addendum to Quality Assurance Project Plan .....	i
2.0 Introduction and Problem Statement .....	1
2.1 Study area and Surroundings .....	1
3.0 Tasks Required .....	3
4.0 Key Individuals and their responsibilities .....	4
5.0 Proposed Project Schedule .....	4
5.1 Budget .....	5
6.0 Sampling locations and frequency.....	6
7.0 Invasive species.....	8
8.0 EIM data.....	8
References .....	9

## 2.0 Introduction and Problem Statement

Fecal coliform (FC) is a type of bacteria common in the digestive tract and feces of humans and other warm-blooded animals. These bacteria themselves are not pathogenic but are of concern because they may indicate the presence of other pathogens and diseases that make people sick.

In 2017, Ecology initiated the process of developing a bacteria Total Maximum Daily Load (TMDL) in the Padilla Bay freshwater tributaries to identify sources of fecal contamination, and specify actions to reduce bacteria to levels that will support recreational beneficial uses.

### 2.1 Study area and Surroundings

The Padilla Bay watershed is a part of the Skagit River delta and is located in the northwest section of Skagit County in Washington State, within the water resource inventory area (WRIA) three (Figure 1). The Padilla Bay watershed consists of four major sloughs, which drain roughly 9,300 ha (22,980 acres). The major sloughs are No Name Slough, Big Indian Slough, Little Indian Slough, and Joe Leary Slough.

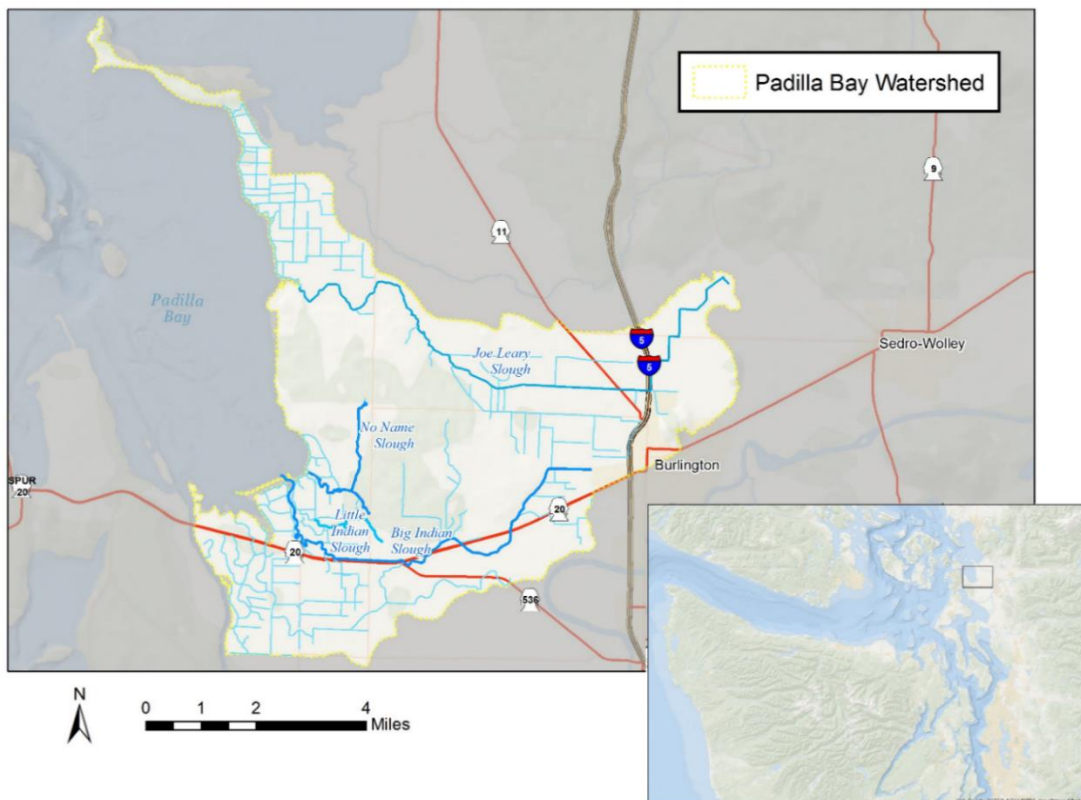


Figure 1- The Padilla Bay Watershed

The Padilla Bay TMDL was completed in 2020. During the development of the TMDL, data collected assisted in identifying areas of higher bacterial concentrations within the sub watersheds. Little Indian Slough demonstrated high levels of bacteria in the upper portion of the watershed (Figure 2), and has been an area of additional source assessment and identification work by Skagit County.

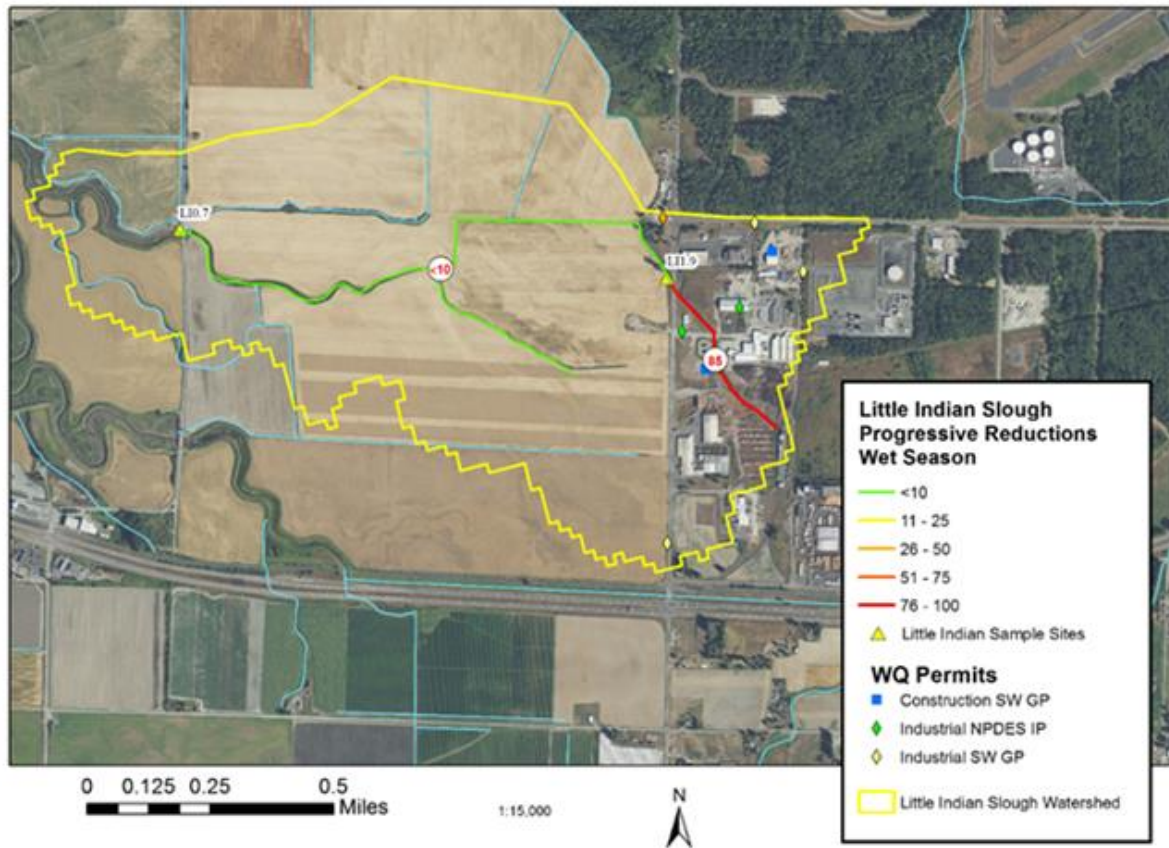


Figure 2 - Little Indian Slough watershed and wet season reduction values

### 2.1.2 Summary of Previous studies and existing data

The following projects include data collection, analysis, or summary information related to Padilla Bay.

[Eastern Padilla Bay Tributaries Fecal Coliform Bacteria Total Maximum Daily Load Study: Water Quality Study Findings<sup>1</sup>](#)

[Padilla Bay Freshwater Tributaries Fecal Coliform Bacteria Total Maximum Daily Load Report - Water Quality Improvement Report and Implementation Plan<sup>2</sup>](#)

<sup>1</sup> <https://apps.ecology.wa.gov/publications/documents/2003001.pdf>

<sup>2</sup> <https://apps.ecology.wa.gov/publications/documents/2010036.pdf>

All historical data, including the data used to develop the TMDL is available for review via the Ecology [Water Quality Atlas](#).

### **2.1.3 Parameters of interest and potential sources**

Ecology will be looking for water pollution (bacteria) that affects water quality in Little Indian Slough. Some of the visual cues field staff will look for include:

- Practices that cause manure, sediment or other pollutants to wash into surface waters.
- Other sources of bacteria pollution that may enter surface waters (e.g. point sources, industrial activities, congregated wildlife, etc.)
- Signs of failing septic systems

When potential bacteria sources are found, Ecology will coordinate with permit managers, partner agencies such as conservation districts, Washington State Department of Agriculture and local health departments to match the property owner(s) with resources and technical assistance needed to help them address the problem.

## **3.0 Tasks Required**

### **Objective 1: Measure bacteria levels in Little Indian Slough**

**Task 1.1:** Evaluate weather forecast and check [Northwest River Forecast Center](#)<sup>3</sup> for predicted rainfall totals and river elevation rise.

**Task 1.2:** Collect grab samples using bottle dip method at designated sampling locations, including flowing surface water and end of pipe discharges. Samples will be a combination of ambient and storm samples.

**Task 1.3:** Collect samples from contaminated ponded stormwater or overload flow identified on site. Collection methods will include use of grab samples using bottle dip or sterile syringes, depending on flow conditions.

**Task 1.4:** In areas where high concentrations are identified, source identification grab samples using bottle dip method (or sterile syringes depending on flow conditions) will be used to refine the focus area.

### **Objective 2: Use data to identify potential bacterial sources, and coordinate with permit manager to conduct site inspections.**

**Task 2.1:** Share data with all permittees in an easily understandable format.

**Task 2.2:** Conduct site inspections as necessary to identify potential sources.

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<sup>3</sup> <https://www.nwrfc.noaa.gov/rfc/>

**Task 2.3:** Develop recommended BMPs to implement on sites to reduce bacterial pollution.

**Task 2.4:** Continue to assess water quality, and verify presence and effectiveness of BMPs.

**Task 2.5:** Work with permit manager as necessary if problems persist, or BMP implementation is refused.

## 4.0 Key Individuals and their responsibilities

**Table 1. Organization of project staff and responsibilities.**

Staff	Title	Responsibilities
Scott Bohling Watershed Unit Water Quality Program Phone: 425-229-5512	Water Clean-up Lead (WRIA 3)	Develops the QAPP addendum. Oversees field sampling and transportation of samples to the laboratory. Conducts QA review of data, analyzes and interprets data, and enters data into EIM. Develops the summary report.
Elizabeth Fint Bellingham Field Office Water Quality Program Phone: 360-296-0274	Stormwater General Permit Manager (WRIA 3)	Assists with site inspections. Assist with permittee meetings and communication. Assist with the development of BMP implementation recommendations.
Ralph Svrjcek (NWRO) Watershed Unit Water Quality Program Phone: 206-594-0164	Unit Supervisor	Provides internal review of the QAPP, approves the budget, and approves the final QAPP.
Rachel McCrea Water Quality Program (NWRO) Phone: 206-594-0146	Water Quality Section Manager	Reviews the project scope and budget, tracks progress, reviews the draft QAPP, and approves the final QAPP.
Alan Rue Manchester Environmental Laboratory Phone: 360-871-8801	Manchester Lab Director	Reviews and approves the final QAPP.
Arati Kaza Phone: 360-407-6964	Ecology Quality Assurance Officer	Reviews and approves the draft QAPP and the final QAPP.

## 5.0 Proposed Project Schedule

Discussion with permittees to assess the willingness to participate in sampling and voluntary implementation in June of 2021. Dry weather site inspections began in August of 2021.

Ecology proposes to start sampling in fall of 2021 for at least one year. Ideally, the intent is to continue identify potential sources, implement practices to reduce bacterial pollution,



and assess effectiveness within a one-year timeline. Additional sampling may be necessary to evaluate implementation and to conduct effectiveness monitoring.

Ecology team members will complete the necessary adjustments to laboratory reports for submittal to EIM. The EIM coordinator has traditionally completed the final upload of sampling results to EIM.

## 5.1 Budget

Due to the proximity of the sample locations, and the potential quick response time necessary to collect storm samples, staff intend to use Edge Analytical. Edge Analytical is a fully accredited laboratory, and has been used in the past to send storm event samples for other projects due to its proximity and greater flexibility to receive samples.

The budget (Table 2) is based on seven sample locations (allowing six sample runs in total) and up to 28 additional source assessment samples.

**Table 2. Proposed budget**

<b>Ecoli+Fecal Coliform (membrane filtration)</b>	<b>Number of Samples</b>	<b>Cost/Sample</b>	<b>Lab Cost</b>
Storm Event Screening Samples	42	\$42	\$1,764
Storm Source ID Samples	28	\$42	\$1,176
<b>Total budget</b>			<b>\$2,940</b>

## 6.0 Sampling locations and frequency

For ambient water quality samples, Ecology team members will follow the standard operating procedure outlined in “Standard Operating Procedure EAP030, Version 2.1: [Collection of Fecal Coliform Bacteria Samples in Surface Water](#).”<sup>4</sup> Discharges from stormwater pipes will be collected directly from the pipe pour location directly into sterile containers and follow all SOP elements regarding sample transport and testing. Where source tracing is performed, appropriate techniques for will be chosen and adapted based on-site characteristics using Specialized Sampling Devices identified in Section 8.2.3 of the Western Washington Nonpoint Investigations QAPP.

Samples will be collected at the following sites based on storm events (Table 3 and Figure 3). Storm event sampling will be determined as described in the “Tasks required” section and will vary in frequency depending on precipitation.

Higher bacteria results are expected during storm events, which may help guide source identification efforts. The team may choose to change storm event locations depending on the results of bacteria samples collected during the previous sampling runs.

**Table 3. Latitude and longitude of sample locations**

	Site/EIM Site ID	Description	Sample method	Latitude	Longitude
1	LI-FTM1	Little Indian Slough, Farm to Market Road.	Grab/bottle dip	48.455339	-122.443831
2	LI-13.0	Little Indian, upstream of the two drain lines (13.1 and 13.2)	Grab/bottle dip	48.45408	-122.44229
3	LI-13.1	Little Indian, pipe of left side of LI (looking North, or west side of LI)	Bottle fill/syringe	48.45409	-122.442311
4	LI-13.2	Little Indian, pipe of the right side of LI (looking north, or east side of LI)	Bottle fill/syringe	48.454103	-122.44228
5	LI-NWHW	Little Indian, boarder near Hughes Farms, Northwest hardwoods, and the Skagit soils rain garden.	Grab/bottle dip	48.452613	-122.441509
6	LI-16	Little Indian, near the confluence with NWHW and Intermodal drainage	Grab/bottle dip	48.45154	-122.4394
7	LI-SWP	Shared stormwater pond, sampled near the outlet.	Grab/bottle dip	48.454351	-122.441231

<sup>4</sup> <https://apps.ecology.wa.gov/publications/documents/1803239.pdf>

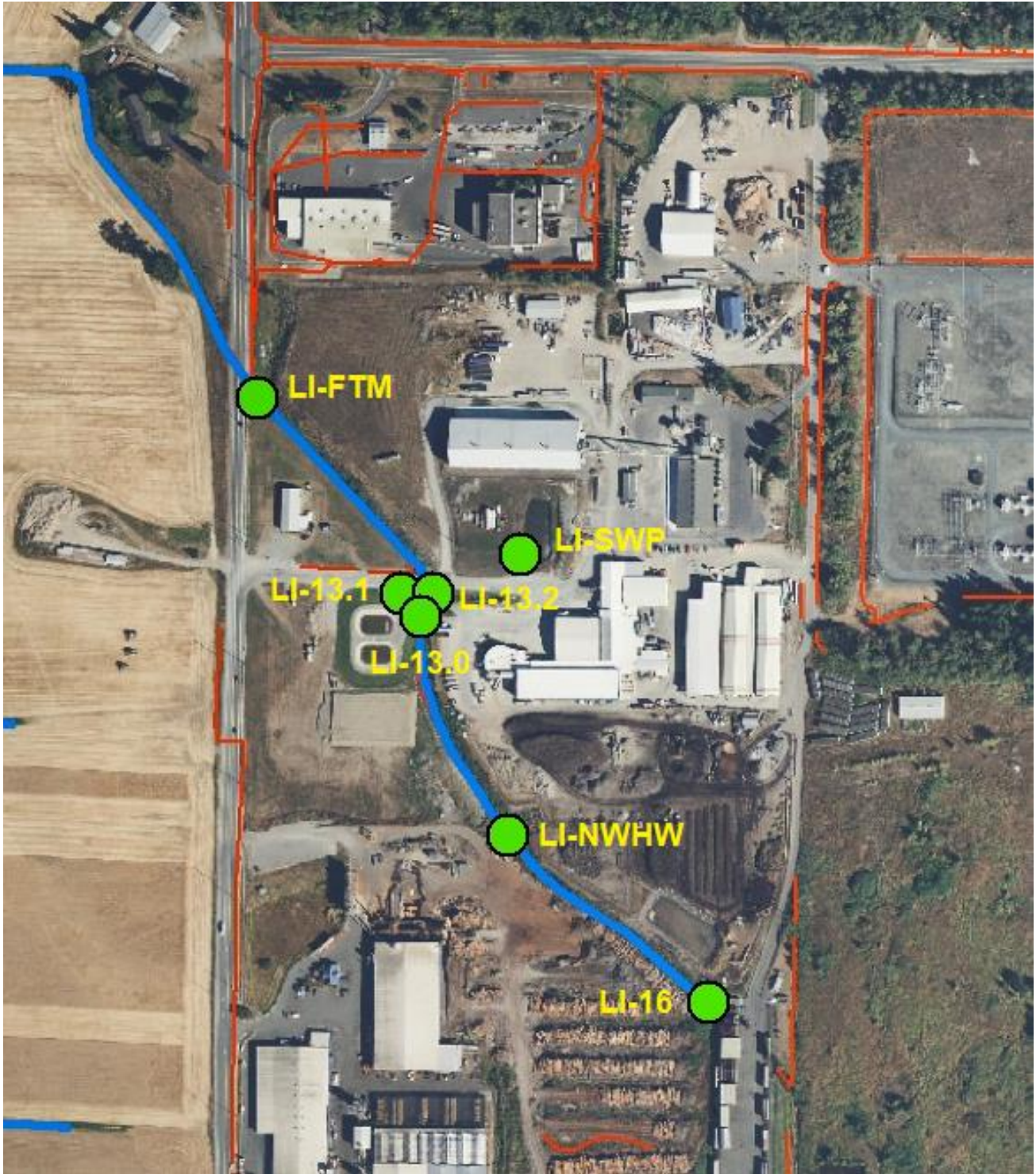


Figure 3. Locations of sample sites in Little Indian Slough

## 6.1 Field parameters and laboratory analytes to be measured

From Table 4 of the Quality Assurance Project Plan: Nonpoint Investigations in Western Washington.

Parameter	Matrix	Recommended Quantity	Container	Holding Time	Preservative
E. coli	Water	250 mL, 500 for QC	250 mL glass/polypropylene autoclaved bottle <sup>5</sup>	24 hours	Fill the bottle to the shoulder; Cool to ≤10°C
Fecal Coliform	Water	250 mL, 500 for QC	250 mL glass/polypropylene autoclaved bottle <sup>5</sup>	24 hours	Fill the bottle to the shoulder; Cool to ≤10°C

## 7.0 Invasive species

### 7.1 Evaluation and applicable procedures, depending on the watershed

New Zealand mudsnails (*Potamopyrgus antipodarum*) are an aquatic invasive species currently found in King County, Snohomish County and an instance in Skagit Basin (Indian Slough, west of Burlington), that are considered an economic and environmental threat to Washington State. These mudsnails are very small, measuring at less than 1/8 inch and can be easily spread through hitchhiking on waders or other aquatic equipment.

To prevent the spread of New Zealand mudsnails, staff will use a sampling pole or other equipment as specified in the Western WA Nonpoint QAPP to take water quality samples at all sample locations to minimize the disturbance of sediments. Sampling will be done upstream to downstream sequence where necessary according to “Standard Operating Procedure EAP070, Version 2.2: [Minimize the Spread of Invasive Species](#).”<sup>5</sup> When traveling between drainage basins, appropriate agency decontamination steps will be used on equipment and protective gear as needed.

## 8.0 EIM data

### 8.1 Upload procedures, including project EIM Study ID when applicable.

All ambient and storm event data collected for this project will be uploaded to EIM. For ambient samples (including ambient source identification samples), the team plans to use PB-LI as the EIM Study ID.

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<sup>5</sup> <https://apps.ecology.wa.gov/publications/documents/1803201.pdf>

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