National Pollutant Discharge Elimination System Industrial Stormwater Permit Evaluation Report No. 1200-Z

Oregon Department of Environmental Quality
700 NE Multnomah St., Suite 600
Portland, OR 97232

Contact: Krista Ratliff, ratliff.krista@deq.state.or.us

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Final Action

The 1200-Z National Pollutant Discharge Elimination System Stormwater General Permit (1200-Z permit) permit will be proposed to the Environmental Quality Commission on March 25, 2021, for adoption. The permit renewal will be done as a rule and adopted into OAR. All facilities will be assigned coverage and renewed under this general permit through agency order.

The current permit was issued in August 2017. Subsequently, Columbia Riverkeeper and Northwest Environmental Defense Center and Oregon Industrial Stormwater Group filed administrative and judicial petitions for reconsideration of the National Pollutant Discharge Elimination System Permit No. 1200-Z Industrial Stormwater General Permit. This resulted in a Consent Judgement and a Settlement Agreement that included a number of items, including a commitment for DEQ to issue this permit no later than March 31, 2021. Although the current permit does not expire until July 31, 2022, the effective date of this permit is July 1, 2021, at which time all existing facilities will operate under the newly adopted permit.

Permit Category

This 1200-Z National Pollutant Discharge Elimination System Industrial Stormwater General Permit will replace the 1200-Z permit, which was last reissued in October 2018. Final action will be taken by end of March 2021.

Activities Covered Under the Permit

The permit covers a broad range of industries throughout Oregon that discharge stormwater to over 180 rivers, streams and other surface waters. There are about 860 facilities registered under the 2018, 1200-Z general permit. This permit regulates various pollutants from industrial activities that may be discharged in stormwater during rain and snowmelt events.

Source Location

Statewide

Coverage and Eligibility

The permit is a general permit issued in accordance with OAR 340-045-0033 where activities involve similar types of operations, similar types of wastes and similar monitoring conditions. This permit issuance will be adopted by reference at OAR 340-045-0033(11) and be available for review on DEQ's industrial stormwater permits webpage, https://www.oregon.gov/deq/wq/wqpermits/Pages/Stormwater-Industrial.aspx. The permit covers industrial activities that have a potential to discharge pollutants to rivers and streams, or conveyance systems that eventually discharge to rivers and streams. The issuance date of the permit is in March 2021, though the effective date will be July 1, 2021, to provide existing facilities time to adjust to new permit conditions.

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1.0 Background

1.1 What did DEQ Reissue?

DEQ reissued the National Pollutant Discharge Elimination System Industrial Stormwater Discharge General; Permit No. 1200-Z.

1.2 Regulatory Context

Congress passed the Federal Water Pollution Control Act of 1972 (Public Law 92-500, October 18, 1972) (hereinafter the Clean Water Act or CWA), 33 U.S.C. 1251 et seq., with the stated objectives to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 101(a), 33 U.S.C. 1251(a). To achieve this goal, the CWA provides that "the discharge of any pollutant by any person shall be unlawful" except in compliance with other provisions of the statute.

CWA section 301(a). 33 U.S.C. 1311. The CWA defines "discharge of a pollutant" broadly to include "any addition of any pollutant to navigable waters from any point source." CWA section 502(12). 33 U.S.C. 1362(12). EPA is authorized under CWA section 402(a) to issue a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of any pollutant from a point source. These NPDES permits are issued by EPA or NPDES-authorized state or tribal agencies. Since 1972, EPA and the authorized states have issued NPDES permits to thousands of dischargers, both industrial (e.g., manufacturing, energy and mining facilities) and municipal (e.g., sewage treatment plants). As required under Title III of the CWA, EPA has promulgated Effluent Limitations Guidelines (ELGs) and New Source Performance Standards (NSPS) for many industrial point source categories and these requirements are incorporated into NPDES permits.

The Water Quality Act (WQA) of 1987 (Public Law 100-4, February 4, 1987) amended the CWA, adding CWA section 402(p), requiring implementation of a comprehensive program for addressing stormwater discharges. 33 U.S.C. 1342(p). Section 405 of the WQA of 1987 added section 402(p) of the CWA, which directed the EPA to develop a phased approach to regulate municipal and industrial stormwater discharges under the NPDES program. EPA published a final regulation on the first phase of this program on November 16, 1990, establishing permit application requirements for "stormwater discharges associated with industrial activity." See 55 FR 47990. EPA defined the term "stormwater discharge associated with industrial activity" in a comprehensive manner to cover a wide variety of facilities. See 40 CFR 122.26(b)(14). EPA issued the 2021 Multi-Sector General Permit (MSGP) under this statutory and regulatory authority.[1]

Oregon Revised Statutes 468B.005(10) defines "Water" or "the waters of the state" as lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.

This definition is more stringent than the definition of waters of the United States and is used to define territorial waters within Oregon for the purpose of this permit.

When sheet flow is exposed to industrial activities or significant materials and discharges to a water of the state, EPA requires that these discharges also be regulated under DEQ's NPDES 1200-Z permit. Concentrating the sheet flow may be required to obtain a sample as outlined in the permit requirements. The same approach is taken by other states include neighboring Washington State. Consistent with this, guidance for collecting sheet flow samples is included in EPA's 2009 Industrial Monitoring and Sampling Guide and Washington Department of Ecology's 2015 Stormwater Sampling Manual. Additionally, requiring monitoring of sheet flow from permitted industrial facilities is consistent with the policies of the state of Oregon to prevent pollution as described in ORS

[1] EPA 2021 MSGP Factsheet, page 2

468B.015, 468B.020 and 468B.025. The final permit was modified to make the requirement to monitor sheet flow clearer.

1.3 Permit History

DEQ's NPDES program is an EPA approved water quality permitting program and is responsible for implementing federal and state regulations and issuing water pollution permits. In 1991, DEQ adopted a series of NPDES general stormwater discharge permits that applied to different industrial sectors. In 1997, DEQ consolidated these sector specific general permits and issued a statewide industrial stormwater general permit 1200-Z permit that covers a broad range of industries throughout the state. In 1999, DEQ issued the 1200-COLS permit for discharges to the Columbia Slough to coincide with the issuance of the Total Maximum Daily Load (TMDL) for the watershed. In 2017, the 1200-COLS was consolidated within the 1200-Z permit.

General permits are required to be renewed every five years.

1.4 Summary of Key Changes

DEQ's changes incorporated into to the 1200-Z permit were in response to EPA's input, water quality standards updates, a lengthy advisory committee process, DEQ and agents' regional inspections and comments from stakeholders. In May 2019, DEQ convened an advisory committee comprised of representatives of affected parties, industries, environmental groups, DEQ's agent and stormwater consultants. The committee met six times between May 2019 to June 2020 and provided input to DEQ on the changes to the permit. Several technical analyses were completed and presented by DEQ's contractor, PG Environmental. PG Environmental has national experience in industrial stormwater regulations, federal regulations and the Clean Water Act. They provided DEQ and the advisory committee members with permit recommendations. All meeting materials can be found here: https://www.oregon.gov/deq/Regulations/rulemaking/Pages/r1200Z.aspx

DEQ's goal was ensure the permit is high quality, protective, implementable and legally defensible as well as appropriate for Oregon. DEQ's general permit approach is similar to EPA's in the 2021 MSGP: incorporating minor revisions to narrative technology-based effluent limits, concentrating on providing a greater level of specificity to existing requirements and strengthening protection of impaired waters. This permit reinforces the distinctions between technology-based limits and water quality-based limits.

The key changes include the following:

- A new framework for managing elevated levels of copper, lead, zinc, iron, pH, and E. coli, discharged to Category 5: 303(d) listed waterways that are impaired for that pollutant. The framework leads to water quality-based effluent limits when monitoring results of impairment pollutants exceed concentrations derived from water quality standards.
- New requirements for permit applicants that discharge to Category 5: 303(d) listed impaired waterways.
- New requirements for facilities that divert stormwater from reaching surface waters to manage pollutant discharges through infiltration devices.
- Changes in monitoring requirements for all current and future permit registrants.
- Revised monitoring based on Oregon's water quality standards.
- Decreased impairment monitoring informed by evaluation of several years of industrial stormwater monitoring data meeting water quality criteria.
- Changes in statewide benchmarks for copper, lead, zinc and biochemical oxygen demand (BOD5) benchmark concentration applicable to Columbia Slough dischargers.
- Expanded regulated area for transportation sector facilities exposed to industrial activities.
- Requiring all facilities to use DEQ's new environmental data management system, Your DEQ Online.

1.5 Additional Noteworthy Changes

For transportation facilities the entire industrial footprint will be regulated, not just the auxiliary operations designated needing coverage in 40 CFR 122.26. Once covered under this permit, transportation sectors must address pollution from all stormwater discharges associated with industrial activities.

Table 1 edits include deletion of "Except Machinery and Transportation Equipment" from Major Group 34. Although the Standard Industrial Codes includes this in their description, removal will eliminate confusion because many of these 4-digit standard codes are associated with transportation and machinery sectors. The exception is related to Machinery and Transportation Equipment having their own Major Groups 35 and 37 respectively. This does not change any 4-digit code designations.

Sector E has been modified to add saltwater criteria where appropriate. Sector E updated all pollutant concentrations consistent with Oregon's water quality standards. For metals concentrations not determined by Monte Carlo modeling, DEQ used median hardness for each georegion from the benchmark modeling as inputs into the hardness-dependent freshwater metals equations[2] to calculate the appropriate concentrations applied for sector-specific monitoring.

The new framework related to impairment exceedances of pH, total copper, total lead and total zinc discharges to Category 5: 303(d) listed waters contains escalation to numeric water quality-based effluent limits. Exceedances of E. coli and total iron for a discharge to Category 5: 303(d) listed waters consist of escalation to a narrative water quality-based effluent limit.

Since the permit will be issued prior to expiration, existing facilities were not required to submit renewal applications.

There are several structural changes compared to the 2018 permit. All monitoring tables have been moved to Schedule B. The intent of structural changes are to improve readability, clarity and use more plain language to help improve compliance. In addition, the terms "permit assignment letter" and "reference concentration" are no longer used and have been removed throughout the permit. The 2018 Permit defined "permit assignment letter" to mean a document sent by DEQ when coverage is granted or renewed that establishes registrant's monitoring year, sampling requirements, pollutant concentrations and monitoring frequency based on applicants' site information. Monitoring parameters include applicable statewide benchmarks, sector-specific benchmarks (primary and co-located), impairment concentrations and numeric effluent limits. This document may contain additional site-specific requirements. DEQ will be transitioning to electronic communications, and therefore the form used by DEQ to assign monitoring requirements may no longer be through a mailed letter. "Reference concentration" was the term used for impairment monitoring concentration targets based on water quality criteria, aquatic or chronic aquatic life or human health, or quantitation limits. The term "reference concentrations" has been replaced with "impairment monitoring" or "water quality-based effluent limit" to better reflect plain language and the source of the impairment concentrations. However, this permit evaluation report refers to "reference concentrations" targets when describing technical analyses performed on stormwater discharge data.

DEQ evaluated paired ambient data (dissolved to total recoverable) to develop and implement regional translators where appropriate. An empirical 80th percentile value of the dissolved metal fraction distribution was used to estimate the translator, instead of a median or geometric mean, to account for variability and provide for a margin of safety within the regional translators. In addition, DEQ developed water quality risked-based saltwater benchmarks for copper, lead and zinc using a similar Monte Carlo modeling methodology as freshwater benchmarks. To account for discharges into estuarine waters, the most stringent benchmark between the freshwater and saltwater will be used for monitoring purposes.

More information on these requirements, as well as other changes are provided in the appropriate sections below.

1.6 Settlement Terms

Short-term changes based on settlement agreement were incorporated into the permit on Oct. 22, 2018. Errors were corrected and substantial changes included:

- Impairment monitoring frequency changed from two times a year to four times a year.

[2] Table 30: Aquatic Life Water Quality Criteria for Toxic Pollutants, Endnote F; OAR 340-041-8033

- When monitoring exceeds an impairment pollutant reference concentration, Tier 1 reports must be submitted no later than 60 days after receiving monitoring results.
- Numeric effluent guideline limitations sampling increased from once a year to semi-annually.
- Quarterly submission of Discharge Monitoring Reports.
- Representative sampling language was revised to more closely reflect EPA's stormwater industrial multi-sector general permit.

Moreover, the settlement agreement, signed Aug. 2018, required the revised draft 1200-Z permit released for public notice include:

- One or more proposed numeric technology-based effluent limit (TBEL), or proposed numeric technology-based benchmarks for the discharge of copper, lead, zinc and TSS.
- One or more proposed site-specific, TMDL-specific, or state-wide, numeric water quality-based effluent limits (WQBELs), if DEQ determines that such limits are appropriate for inclusion in the permit; and
- Monitoring and reporting requirements that DEQ determines are necessary to ensure and verify compliance, at discharge point(s) identified in each Covered Facilities' stormwater pollution control plan, with numeric TBELs, WQBELs, or benchmarks included in the permit.

The rulemaking advisory committee assessed the above conditions in great detail. This report includes high-level explanations and outcomes from those detailed presentations and discussions.

1.7 Local Municipalities That Serve as DEQ's Agent

DEQ authorizes local public entities under a Memorandum of Agreement to act as its agent and implement the permit on DEQ's behalf. The following local public entities currently act as DEQ's agent for the 1200-Z permit: City of Portland, City of Eugene and Clean Water Services, which includes all or parts of the cities of Beaverton, Cornelius, Forest Grove, Hillsboro, Sherwood, Tigard and Tualatin.

The agents typically conduct the following activities: application and stormwater pollution control plan (SWPCP) review, inspections, monitoring data review, general compliance activities and verification of no-exposure certifications. Throughout the permit, DEQ uses the language "DEQ or agent" to reflect this partnership. If a facility is operating in an agents' jurisdiction, they must submit the materials to the agent rather than DEQ, with the exception of permit transfers. Also, the agent will evaluate permit compliance for facilities within their jurisdictions.

DEQ's agents will not transition to electronic reporting immediately upon this permit renewal; therefore, permit registrants in agents' jurisdiction will continue to submit paper reports until directed otherwise.

1.8 Antidegradation Review

Federal regulations at 40 CFR 131.12 require that state water quality standards include an antidegradation policy consistent with federal policy. OAR 340-041-0004 establishes antidegradation requirements applicable to the renewal of this permit. Oregon's Antidegradation Policy prevents unnecessary and further degradation from new or increased point and nonpoint sources of pollution. Where additional discharges have been authorized or permit conditions have been relaxed, the changes must be consistent with the requirements specified at OAR 340-041-0004. Antidegradation requirements are often evaluated using three categories: Outstanding Resource Waters (Tier 3), High Quality Waters (Tier 2), and Water Quality Limited/Impaired (Tier 1). Antidegradation considerations for each category are discussed below.

Where waters constitute an outstanding state or national resource such as those waters designated as extraordinary resource waters, or as critical habitat areas, the existing water quality and water quality values must be maintained and protected. These waters are referred to as Outstanding Resource Waters. The eligibility requirements of this permit specifically exclude new discharges to waters designated as Outstanding Resource Waters, thus the terms and conditions of this permit are consistent with OAR 340-041-0004 for Outstanding Resource Waters.

Outstanding Resource Waters include: 1) North Fork Smith River and its tributaries and associated wetlands, Waldo Lake and its associated wetlands, and Crater Lake.

Where existing water quality meets or exceeds those levels necessary to support fish, shellfish and wildlife propagation; recreation in and on the water and other designated beneficial uses, that level of water quality must be maintained and protected. However, the lowering of water quality may be allowed if the following requirements are met:

- No other reasonable alternatives exist except to lower water quality;
- The action is necessary, and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality;
- All water quality standards will be met and beneficial uses protected; and
- Federal threatened and endangered aquatic species will not be adversely affected.

This permit relies on an adaptive management approach to protect water quality, using benchmarks and monitoring to assist the permit registrant in determining whether site controls are effectively reducing pollutant concentrations in stormwater discharges and require further assessment of pollutant control practices. Freshwater and saltwater benchmarks for copper, lead and zinc were developed as described in Appendix A of this Report. DEQ expanded the freshwater benchmarks to seven georegions, thus some benchmarks are more stringent than the benchmarks contained in the 2018 permit and other benchmarks in some georegions are less stringent. The new benchmark values resulted from revised georegions and new water quality data. The revised benchmarks retain the same methodology considerations (Appendix A and B) and water quality criteria. As such, the revised benchmarks retain the same standards and are as protective of water quality as the previous benchmarks. Additionally, provisions and pollutant control measures required under this permit are anticipated to retain similar or better stormwater discharge quality than under the previous permit. No degradation of water quality is anticipated due to the revised benchmarks. Further, Schedule A.3 of this permit establishes that permit registrants must not cause or contribute to an exceedance of instream water quality standards, and requires corrective actions if exceedances are identified.

Additionally, if DEQ receives information that existing uses differ from designated beneficial uses in the receiving water, DEQ has the option of imposing more stringent benchmarks to ensure that existing uses are protected. Since implementing this approach on a facility-by-facility basis under a general permit is impractical, DEQ may require a permit applicant or existing permit registrant to apply for an individual permit.

The benchmark for oil and grease has been removed. A review of the data from January 2000 and December 2018 shows attainment with the previous benchmark for the vast majority of facilities. DEQ has determined that the oil and grease numeric benchmarks may not be a reliable indicator of the presence of the pollutant at levels consistent with the applicable water quality standard. The applicable narrative criterion (OAR 340-041-0007) states: "[o]bjectionable discoloration, scum, oily sheens, or floating solids, or coating of aquatic life with oil films may not be allowed." A numeric benchmark indication of compliance or non-compliance with the narrative criterion will be highly site- and industry-specific. CWA section 402(a)(2) obligates the permitting authority to prescribe conditions within permits that assure compliance, including conditions on data and information collection, reporting and such other requirements deemed necessary. In simple terms, if there is a permit requirement, DEQ must be able to access compliance. Combined with other monitoring, visual assessments provide a reliable and cost-effective method to achieve this requirement specified in the CWA. Further, the use of visual monitoring to assess compliance is more accurate for evaluating consistency with the applicable water quality criterion. DEQ and EPA find that visual observation of signs of pollution is an appropriate monitoring strategy to prevent the potential of petroleum products in the discharge.

This permit retains the requirement for permit registrants to conduct a Tier 1 response to any monthly visual inspections that show a visible oil sheen. DEQ does not anticipate that the removal of the numeric oil and grease benchmark will result in a reduction of pollutant controls or a degradation of water quality due to the continued permit conditions for visual inspections and required response actions when a sheen is visible. EPA's industrial permit does not currently, nor has ever, required an oil and grease benchmark.

Oregon's Antidegradation Policy specifically prohibits the further degradation of impaired waters, as defined at OAR 340-041-0002, with some exceptions, including but not limited to:

- The pollutant parameters associated with the discharge are unrelated to the parameter(s) causing the receiving stream violation; or
- A TMDL with applicable WLAs and a reserve capacity has been established for the impaired water body, and there will be sufficient reserve capacity to assimilate the increased load under the established TMDL.

A new discharger to an impaired water without a TMDL, based on the EPA-approved Category 5: 303(d) list for pH, copper, lead, zinc, iron and E. coli must meet one of the following conditions to obtain coverage under this permit, and document the justification of compliance with these conditions in applicant's Stormwater Pollution Control Plan (SWPCP).

- Prevent exposure to stormwater for which the water body is impaired.
- Provide technical demonstrations that sources for which the water body is impaired are not present at the site.
- Provide analytical sampling results to demonstrate discharge is not expected to cause or contribute to an exceedance of water quality standards.

An applicant must demonstrate that an impairment pollutant(s) will not be present in discharge, or provide data and other technical information that demonstrates that the discharge is not expected to cause or contribute to an exceedance of the water quality standard for which the water body is impaired at the point of discharge, or DEQ will not grant permit coverage. Prior to granting permit coverage, DEQ or agent will make a determination the new discharge has met the permit conditions for coverage.

A new discharger to an impaired water with a TMDL that was approved on or before March 31, 2021, and establishes wasteload allocation for industrial stormwater must comply with the conditions of the TMDL. DEQ may require additional monitoring, site controls or compliance schedules to prevent industrial stormwater from exceeding the wasteload allocation(s) in the TMDL.

For existing discharges into an impaired water, the conditions of this permit are protective of water quality. Section 3.3, 3.4, and 3.8 provides further explanation about the narrative and numeric water quality-based effluent limitations which have been established for pollutants of concern for discharges to impaired waters where an adaptive management approach is determined to be insufficient. These water quality-based effluent limits are anticipated to control pollutant concentrations to prevent further degradation of water quality and designated uses of the waters. Schedule A.3 of this permit establishes essential permit provisions prohibiting permit registrants from causing or contributing to an exceedance of instream water quality standards and requires corrective actions if exceedances are identified.

The Columbia Slough TMDL has established an applicable BOD_5, biochemical oxygen demand, wasteload allocations for industrial wastewater. During this permit renewal, DEQ recalculated the BOD_5 benchmarks consistent with the requirements of the TMDL.

DEQ considers that use of less than 10% of assimilative capacity in a receiving water is considered *de minimis* and not a lowering of water quality and is thus not subject to a Tier 2 antidegradation review. If an assignment of new permit coverage would result in use of greater than 10% of assimilative capacity for any pollutant, DEQ may require a Tier 2 antidegradation review or may require more stringent benchmarks to ensure that there is no lowering of water quality.

Due to the reasons discussed above, the conditions of this permit are not anticipated to result in the degradation of water quality and are consistent with the requirements of OAR 340-041-0004.

2.0 Condition I: Permit Coverage and Exclusions from Coverage

DEQ general permit coverage eligibility reflects the option for a facility to elect coverage under an individual permit rather than a general permit. The cover page also includes the expiration date of the permit that will not exceed five years from the date of issuance.

2.1 Industrial Sectors and Activities Covered

Pursuant to 40 CFR 122.26(b)(14)(i - ix, xi), certain "stormwater discharges associated with industrial activities" are eligible for coverage under the 1200-Z permit. The permit defines "industrial activity" as "the categories of industrial activities included in the definition of 'stormwater discharges associated with industrial activity' as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi) or activities identified by DEQ as a significant contributor of pollutants, such as Table 2." Thus, DEQ made the determination that these activities represent significant contributors of pollution. DEQ has found that these activities, when conducted at other sites and exposed to stormwater, are shown by 1200-Z permit monitoring data and stormwater source control evaluations to result in stormwater discharges containing pollutants also found in the sediment and water column of the Columbia Slough and Portland Harbor. In regard to the federal regulation, the bulk of the activities listed in Table 2 appear in 40 CFR 122.26 (b)(14), which includes the caveat of "includes, but is not limited to."

Table 1 below provides a list of 29 categories of industrial activities and Standard Industrial Classification (SIC) codes that are eligible for permit coverage, if a facility may discharge industrial stormwater to surface waters or to conveyance systems that discharge to surface waters of the state. A complete list of SIC Codes (and conversions from the newer North American Industry Classification System") is located at https://www.census.gov/naics/ or in paper form from the document titled *Handbook of Standard Industrial Classifications*, Office of Management and Budget, 1987.

Table 1 has a minor edit to Standard Industrial code major group 34, Fabricated Metal Products. The change removes "Except Machinery and Transportation Equipment." Many of the industrial establishments in this major group support machinery and transportation operations as parts manufacturing. If a facility engages in an operation or makes a product in the major group 34: Fabricated Metals Products, they are required to meet sector-specific requirements in Schedule E, Sector AA.

Transportation sectors facilities eligibility for coverage is dependent on having auxiliary operations such as, vehicle maintenance shops (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations or airport deicing operations. Once covered, 40 CFR 122.26 (14)(viii), limits the regulated industrial footprint to only portions of the facility discharging from these auxiliary operations. DEQ added footnote one to Table 1, comprised of new language to expand the regulated footprint of facilities under the Transportation Standard Industrial Codes below, to all industrial stormwater discharge associated with industrial activity.

Table 1. Sources Covered

Industrial Sources Covered Under this Permit
Facilities with the following primary Standard Industrial Classification (SIC) codes: 10 Metal Mining 12 Coal Mining 13 Oil and Gas Extraction 20 Food and Kindred Products 21 Tobacco Products 22 Textile Mill Products 23 Apparel and Other Finished Products Made From Fabrics and Similar Material 24 Lumber and Wood Products, Except Furniture (Activities with SIC 2411 Logging that are defined in 40 CFR §122.27 as silvicultural point source discharges are covered by this permit.) 25 Furniture and Fixtures 26 Paper and Allied Products 27 Printing, Publishing and Allied Industries 28 Chemicals and Allied Products Manufacturing and Refining (excluding 2874: Phosphatic Fertilizers) 29 Petroleum Refining and Related Industries (excluding 2951, covered by 1200-A) 30 Rubber and Miscellaneous Plastics Products 31 Leather and Leather Products 32 Glass, Clay, Cement, Concrete and Gypsum Products (excluding 3273, covered by 1200-A) 33 Primary Metal Industries 34 Fabricated Metal Products 35 Industrial and Commercial Machinery and Computer Equipment 36 Electronic and Other Electrical Equipment and Components, Except Computer Equipment 37 Transportation Equipment 38 Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks 39 Miscellaneous Manufacturing Industries 4221 Farm Product Warehousing and Storage 4222 Refrigerated Warehousing and Storage 4225 General Warehousing and Storage 5015 Motor Vehicle Parts, Used 5093 Scrap and Waste Materials
Facilities with the following primary SIC codes that have vehicle maintenance shops (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations[1]: 40 Railroad Transportation 41 Local and Suburban Transit and Interurban Highway Passenger Transportation 42 Trucking and Courier Services, Except Air (excluding 4221, 4222, and 4225) 43 United States Postal Service 44 Water Transportation 45 Transportation by Air 5171 Petroleum Bulk Stations and Terminals, except petroleum sold via retail method.
Steam Electric Power Generation including coal handling sites
Landfills, land application-sites and open dumps
Hazardous Waste Treatment, storage and disposal facilities
Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, recycling, and reclamation of municipal or domestic sewage (including land dedicated to the disposal of sewage sludge that are located within the confines of the facility) with the design flow capacity of 1.0 mgd or more, or required to have a pretreatment program under 40 CFR §403.

[1]Eligibility based on auxiliary operations; however, once covered all stormwater discharge associated with industrial activities are regulated under this permit.

Table 2 is specific to discharges into Columbia Slough and Portland Harbor. The approach for including a Portland Harbor-specific georegion was modeled after the approach taken in the Columbia Slough. The 1200-COLS general permit was issued in 1999 to coincide with issuance of an EPA-approved TMDL for the Columbia Slough. The 1200-COLS general permit contained "Table 2: Additional Industrial Activities Covered," which was intended to capture additional industrial sources that may contribute to the impairment of the Columbia Slough, as described in the Columbia Slough TMDL. In 2017 the 1200-COLS permit was incorporated into the 1200-Z permit, eliminating a separate industrial stormwater discharge permit applicable to the Columbia Slough watershed.

In addition to the industrial sources listed in Table 1, facilities that discharge stormwater into the Columbia Slough or Portland Harbor that is exposed to any of the industrial activities listed in Table 2 below are eligible to obtain permit coverage under the 1200-Z permit. If industrial activities under Table 2 are the basis for permit coverage, any industrial activities under Table 1 at that facility are also regulated under the permit.

Table 2. Additional Industrial Activities Covered

Discharges to Columbia Slough and Portland Harbor
Maintenance of vehicles, machinery, equipment, and trailers (including repairs, servicing, washing, testing and painting)
Storage of vehicles, machinery, equipment (including disposal/refuse containers stored by a disposal/refuse contractor/vendor), and trailers (including rental, sales, wrecked vehicles, fleet, and general storage)
Materials storage (including raw materials; bulk fuels, chemicals, detergents, and plastic pellets; finished materials; lumber and food products; wholesale gravel, sand, and soil stockpiles; and bulk liquids other than water)
Waste handling (including recycled product storage, composting, tires, and bulk hazardous waste)
Commercial animal operations (such as kennels, race tracks, and veterinarians not covered under a Confined Animal Feeding Operation permit)
Fuel distribution and sales (including bulk stations, fuel oil dealers, manned and unmanned retail stations, fleet fueling, mobile fueling, and truck stops)
Any former activity that resulted in significant materials (as defined in Schedule D) remaining on-site

2.2 New Discharger to Impaired Waters

If a facility should have obtained coverage under this permit for the discharge and failed to do so, they are considered a new discharger if the discharge commenced after August 13, 1979 (40 CFR 122.2).

Every two years, DEQ is required to assess water quality and report to the U.S. EPA on the condition of Oregon's waters. DEQ prepares an Integrated Report that meets the requirements of the federal CWA for Sections 305(b) and 303(d). CWA Section 303(d) requires identifying waters that do not meet water quality standards and where a TMDL needs to be developed. TMDLs are established pollutant load limits for impaired water bodies.

The Integrated Report includes an assessment of each water body where data are available and the list of waters identified under Section 303(d) as water quality limited and needing a TMDL. Waters may be added as Category 5: 303(d) list based on: evaluation of new data; application of new or revised water quality standards; errors in assessment; or information showing water quality has declined or improved. Waters may be removed from the 303(d) list when: TMDLs or other control measures have been established that are expected to improve water quality; data show water quality has improved; or in some cases when water quality standards are revised.

Oregon's 2018/2020 303(d) list was approved by the U.S. Environmental Protection Agency on Nov. 12, 2020. DEQ will use the 303(d) list in effect at the time of permit assignment to establish impairment monitoring requirements.

New dischargers applying for coverage to an impaired water without a TMDL, Category 5: 303(d) listed waters, must demonstrate they will not cause or contribute to an exceedance of water quality standards prior to coverage under this permit. A discharge to an impaired water occurs when industrial stormwater discharges directly or indirectly flows through a conveyance system into a listed assessment unit or segment of water that has been identified as not meeting water quality criteria for a pollutant. The permit requires any new source or new discharger to demonstrate its ability to comply with 40 CFR 122.4(i) (i.e., prohibiting the issuance of permits to new sources and new dischargers that will cause or contribute to the violation of water quality standards) prior to coverage under the permit.[3]

It is the responsibility of the new discharger to determine the discharge point where industrial stormwater enters a water body. Once the information is submitted to the regulatory authority, DEQ or their agent must decide if the applicant can be assigned to this permit and document which conditions below applies. To satisfy the requirements of 40 CFR 122.4(i), a new discharger to an impaired water without a TMDL, based on the EPA-approved Category 5: 303(d) list in effect at the time of permit application, for pH, copper, lead, zinc, iron and E. coli that correspond to the specific pollutant(s) for which the water body is impaired, must meet one of the following conditions to obtain coverage under this permit:

- Prevent exposure to stormwater for pH, copper, lead, zinc, iron and E. coli that correspond to the specific pollutant(s) for which the water body is impaired. Document the procedures taken to prevent exposure in the Stormwater Pollution Control Plan (SWPCP).
- Provide technical demonstrations that sources of pH, copper, lead, zinc, iron and E.coli that correspond to the specific pollutant(s) for which the water body is impaired are not present at the site and document these findings and considerations in the SWPCP.
- Provide DEQ or agent stormwater discharge analytical sampling results to demonstrate the discharge of stormwater is not expected to cause or contribute to an exceedance of water quality standards for pH, copper, lead, zinc, iron and E. coli that correspond to the specific pollutant(s) for which the water body is impaired at the point of discharge and retain in the SWPCP.

If unable to demonstrate pH, copper, lead, zinc, iron and E. coli that correspond to the specific pollutant(s) for which the water body is impaired will not be present in the discharge, provide DEQ or agent with other technical information that demonstrates the discharge is not expected to cause or contribute to an exceedance of water quality standards at the point of discharge and document the rationale in the SWPCP.

If an applicant is unable to meet the new discharger criteria for coverage, then they must obtain coverage under an individual discharge permit or cease discharge. If a new discharger has stormwater discharge sample results, they must submit them with the permit application.

For the purpose of this permit, impairment parameters will be identified by the list in effect at the time facilities are granted coverage under this permit. Pollutants are limited to:

- pH
- copper
- lead
- zinc
- iron
- E. coli

[3] EPA 2021 MSGP Factsheet, page 21

During the rulemaking process to issue this general permit, all stormwater data was evaluated to ascertain what pollutants were discharged above the impairment concentrations. Permit registrants have been required to sample discharges for all impairments on the Category 5: 303(d) list since 2012. For water bodies with impairments for a particular pollutant, PG Environmental evaluated all representative data for discharges of that pollutant to the impaired water body, regardless of the monitoring type. This means the analyses considered data collected for impairment monitoring, benchmark monitoring, numeric effluent limit monitoring and additional monitoring.

The objective of the data evaluation was to summarize:

- Impairment data exceeding reference concentrations.
- A breakdown of effluent impairment data and its receiving waters.
- Trends related to the certain sectors exceeding the reference concentration of impairments.

The analysis included stormwater data reported in 1200-Z permit Discharge Monitoring Report forms between January 2000 and December 2018 for permit registrants. Based on the frequency of exceeding the concentrations by more than 10 percent, the impaired list of pollutants was reduced to those pollutants most likely to potentially cause or contribute to exceedances of water quality. This analysis and others are found on DEQ's rulemaking webpage, including meeting presentations by PG Environmental and DEQ and meeting summaries. https://www.oregon.gov/deq/Regulations/rulemaking/Pages/r1200Z.aspx

When a TMDL establishes an industrial stormwater wasteload allocation, a new discharger may only be granted coverage under the general permit after DEQ or agent has made an affirmative determination the TMDL has sufficient remaining loading capacity in the impaired water body to support a new discharge. If the applicable TMDL does not establish an industrial stormwater as a source such that no wasteload allocation is provided, the compliance with the terms and conditions of the permit is presumed consistent with the TMDL. DEQ may require coverage under an individual discharge permit or additional monitoring, site controls or compliance schedule in order to be covered under the general permit and be consistent with the EPA-approved TMDL.

Regulations governing impaired waters and TMDLs are in the Code of Federal Regulations. Issued in 1992, the regulations stipulate that states are to continue to identify waters that require TMDLs and ascertain the pollutants causing or expected to cause the impairment based on readily available data and information. States establish a priority ranking to put in place plans for establishing a total pollutant load and parse out the load from point (the wasteload allocation) and nonpoint sources. While developing a TMDL, industrial stormwater source impacts are evaluated.

The Columbia Slough TMDL has established applicable BOD_5 wasteload allocations for industrial wastewater. This permit meets all applicable terms of EPA-approved TMDLs.

The permit includes the current exemptions if a water body is impaired or has a TMDL for biological communities (biocriteria), including harmful algal blooms and aquatic weeds, where no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment; or temperature, habitat and flow modifications. Although, the Category 5:303(d) list has been limited to particular pollutants for the purposes of the permit, there may be instances where an unpermitted facility or an individual permitted facility may have stormwater data for these parameters. If this is the case, under this general permit these pollutants are not identified as a contributor impacting these type of impaired water bodies.

2.3 New Application for Permit Coverage

During this permit cycle, DEQ will bring its application, payment and reporting processes into one online platform, transitioning from paper documents to electronic formats. The online system will be the platform to submit applications and renewals, make electronic payments, track status of reports submitted, transfer or terminate permit coverage and communicate with DEQ quickly and easily through a single portal. Facilities located in agent's jurisdictions will continue to operate outside the online platform, until directed by DEQ.

There will be a waiver process from use of the electronic system.

If a facility was previously under an individual permit or is changing its process to a new primary SIC code, the registrant must submit a new application and fee and a new stormwater pollution control plan to account for changes such as nature of pollutants and any sector specific requirements. Prior to granting coverage, DEQ will provide a 30-day public notice period of the stormwater pollution control plan.

Transfer of permit coverage between legal entities where there will also be a change in an industrial process at the site to a new primary industrial sector requires a new application.

2.4 Existing Facilities Covered under the 2018 1200-Z Permit

DEQ will notify existing registrants once coverage is granted under the new permit and facilities will have until August 31, 2021, to submit an updated SWPCP unless a later date is approved by DEQ or agent. Once the permit is issued, facilities will be updated about the new permit conditions and will have five months to complete and submit an updated plan. The permit will not be effective until July 1, 2021, at which time existing facilities will need to comply with all permit conditions. Since the permit will be effective prior to expiration, no renewal applications were required.

Facilities must comply with the implementation deadlines established under the previous 1200-Z permit, including Tier 2 corrective action requirements. This applies to most permit registrants that exceeded the geometric mean of the benchmarks during the reporting year 2018/2019, with an installation deadline of June 30, 2021. However, existing permit registrants with a Tier 2 deadline of June 30, 2021, or later will not be required to conduct additional Tier 2 evaluation for the same pollutant(s) and monitoring point(s) during this permit cycle.

2.5 Electronic Submittal

When directed by DEQ, the permit registrant must submit reports, including all applications, fees, reports, plans and Land Use Compatibility Statement (LUCS) to DEQ electronically. The permit registrant must sign and certify all electronic submissions in accordance with the requirements within Schedule F in accordance with 40 CFR 122.22.

2.6 Name Change or Transfer of Permit Coverage

When directed by DEQ, name change or transfer forms will be sent to DEQ through "Your DEQ Online," DEQ's web-based electronic platform. If a new owner intends to change industrial process at the site to a new primary SIC code, the owner must submit a new application and is not eligible for a transfer.

If an existing facility operating under permit coverage intends to change industrial processes at the site to a new primary industrial SIC code, the permit outlines a new more appropriate application process. Instead of a new application the permit registrant is now required to submit the following:

- A determination, on a DEQ-approved form, from the local government agency with land use jurisdiction that states the use is compatible with acknowledged local land use plans;
- A revised SWPCP; and
- Environmental management plan review fee.

2.7 "No Exposure" Conditional Exclusion from Permit Coverage

This section did not undergo any edits during the permit renewal.

2.8 Authorized Non-Stormwater Discharges

This section no longer includes language about separating interior floor drains and process wastewater from the stormwater drainage system or language specific to separate permit coverage for any wastewater discharge. These two sections have been moved to Limitations on Coverage.

Vehicle wash water, as well as routine external building wash down and pavement wash water, remain authorized non-stormwater discharges. Washing, particularly power washing and vehicle washing, may contain significant quantities of oil and grease, suspended solids, heavy metals and organics. The permit restricts vehicle washing to the exterior of vehicle and less than eight vehicles per week.

Restrictions apply when washing any surface including: no use of organic solvents, soaps, hot water and washing any dirt or spills prior to cleaning. Many local municipalities have pollution prevention outreach materials regarding washing. Washington Department of Ecology's Vehicle and Equipment Washwater Discharges, Best Management Practices Manual, November 2012 is a good resource for pollution prevention techniques.

2.9 Limitations on Coverage

This section states alternative options for NPDES coverage and limitation on coverage. As mentioned above, these two sections were moved under Limitations on Coverage header.

- The permit registrant must separate any piping of interior floor drains and process wastewater discharge points from the storm drainage system to prevent unpermitted discharge of pollutants to waters of the state. Discharge from floor drains to the stormwater drainage system is a violation of this permit.
- Any other wastewater discharge or disposal, including stormwater mixed with wastewater is not authorized under this permit and must be permitted in a separate permit, unless the wastewater is reused or recycled without discharge or disposal or is discharged to the sanitary sewer with approval from the sanitary sewer system operator.

Besides this change, the permit includes new language applicable to certain industrial sectors authorized to discharge construction stormwater under the 1200-Z permit. If an industrial facility disturbs an acre or more of land, 1200-C construction stormwater discharge permit registration is required prior to construction, except for sectors G, H and certain land disturbing activities in sectors L and K.

In order to avoid conflict with the anti-backsliding provisions of the CWA, transfer from an individual permit to the 1200-Z permit will only be allowed where both of the following conditions are met:

- The individual permit did not contain numeric water quality-based effluent limitations developed for the stormwater component of the discharge; and
- The permittee includes any specific BMPs for stormwater required under the individual permit in their SWPCP.

Implementation of a comprehensive SWPCP for the entire facility (as opposed to selective discharge points in an individual permit) and compliance with all other conditions of the 1200-Z permit is deemed to be at least as stringent a technology-based permit limit as the conditions of the individual permit. This assumption is only made where the individual permit did not contain any specific water quality-based effluent limitations on stormwater discharges, such as stormwater contained high levels of zinc and the individual permit contained a zinc limit developed to ensure compliance with the state water quality criteria.

3.0 Schedule A

Schedule A of the permit contains the following requirements:

Technology-based Effluent Limitations
- Narrative Technology-based Effluent Limitations
- Control Measures for Numeric and Narrative Technology-based Effluent Limitations

Water Quality-based Effluent Limitations
- Water Quality Standards
- Discharge to Impaired Waters

Stormwater Discharge
- Statewide and Sector-Specific Benchmarks
- Mass Reduction Measures
- Numeric Effluent Limits

Stormwater Pollution Control Plans
- Preparation and Implementation of SWPCP
- SWPCP Revisions
- Required Elements

Benchmark Exceedances Corrective Actions
- Tier 1 and Tier 1.5 Corrective Actions
- Tier 2 Corrective Actions

Category 5: 303(d) Listed Waters Exceedance Response
- Water Quality-based Effluent Limits

Permit Compliance
- Authorization Under this Permit

3.1 Narrative Technology-based Effluent Limits (TBEL)

3.1.1 Description of Narrative Technology-based Limits

Technology-based limits are established in this permit as either federal-required numeric effluent limitation guidelines (ELGs) or narrative technology-based effluent limits. Pursuant to 40 CFR 122.44(k) this permit includes narrative TBELs, by implementation of stormwater control measures. The CWA requires that discharges from existing facilities at a minimum meet the narrative TBELs in the permit. Longstanding federal regulations of industrial stormwater discharge permits have contained effluent limits that correspond to required levels of technology-based controls. The permit contains narrative and numeric technology-based effluent limits that taken as a whole constitute the required levels of technology-based control for the pollutants that may be discharged in industrial stormwater.

The permit follows EPA's approach to control measures consistent with the CWA and regulations for implementation of control measures contained in 40 CFR 122(k)(4). Section 402(a)(2) of the CWA states: "The administrator shall prescribe conditions for such permits to assure compliance with the requirements in paragraph (1) . . . including conditions on data and information collection, reporting and such other requirements as he deems appropriate." (Section 402(a)(1) includes effluent limitation requirements.) This statutory provision is reflected in the CWA implementing regulations, which state that best management practices (i.e., control

measures), can be included in permits when "[t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA." 40 CFR 122.44(k)(4).[4]

The regulatory framework above requires each facility to select, design, install, implement and maintain control measures or best management practices outlined in an individually tailored SWPCP, with the goal of reduction or elimination of pollutants from stormwater discharges. This approach requires permit registrants to minimize pollutants, including the exposure of raw, final and waste materials to precipitation. Neither DEQ nor EPA generally mandate the specific controls a facility must select, design, install and implement. This permit provides flexibility to registrants so they may choose technologically available and economically practicable control factors most suited to each specific industry and facility.

Failure to implement the narrative technology-based effluent limits in the permit as described in a stormwater plan is a permit violation.

3.1.2 Narrative Technology-based Effluent Limits

Permit registrants are required to meet the following narrative TBELs: (1) minimize exposure, (2) oil and grease, (3) waste chemicals and material disposal, (4) erosion and sediment control, (5) debris control, (6) dust generation and vehicle tracking of industrial materials, (7) housekeeping, (8) spill prevention and response, (9) preventative maintenance, (10) employee education and (11) non-stormwater discharges. Minimal edits were made to the Schedule A, technology-based effluent limitations section.

The permit makes it clear that, if temporary covers such as tarps will be used to meet the TBELS on minimizing exposure, waste chemicals or material disposal, they must be properly secured.

Unless permitted under a NPDES or Water Pollution Control Permit (WPCF) permit, discharge of wash water is recommended to drain to a closed-loop system, infiltrate into a vegetated area or may be discharged only if it complies with the restrictions outlined in authorized non-stormwater discharge condition 8 of the permit. Discharge of wash water often requires pre-authorization from the local sanitary district.

The requirement to control exposed areas under erosion and sediment control includes areas where significant materials remain from past industrial activity. The definition of significant materials has been expanded from the federal definition under 40 CFR 122.26(12) to include Toxic Substance Control Act or TSCA passed by Congress in 1976.

Cross-program coordination with DEQ's cleanup program is critical to prevent migration of contaminants to surface waters due to stormwater contact with exposed contaminated soils. This may impact some known cleanup sites and orphan sites for re-development, as well as unknown and discovered contamination. The federal definition of stormwater associated with industrial activity (40 CFR 122.26(b)(14) intends to control pollutants from areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater.

If an industrial facility aims to control erosion and sediment with the use of stabilization polymers or chemicals such as polyacrylamide, the permit includes identification of these. EPA's 2021 MSGP also includes this additional requirement.

When developing routine housekeeping procedures, the permit requires defined schedules of implementation.

Spill prevention and response procedures added explicit language to necessitate all spills or leaks must be cleaned up promptly to prevent discharge of pollutants and use spill/overflow protection equipment.

[4] EPA 2021 MSGP Factsheet, page 34

The employee education requirement reflects EPA's industrial permit to include a list of the personnel that must be trained. Based on inspections, DEQ requires that when key personnel change, training on the SWPCP must take place no later than 30 calendar days once new staff is re-assigned. All training must be documented and kept on-site to confirm the appropriate staff have completed education no later than 30 calendar days of hire or upon change in duties for key designated staff and annually thereafter. Not all employees are required to be trained; however, those who are responsible for monitoring and inspections, BMP installation and maintenance, storage and handling of chemicals, and those responsible for taking corrective actions, as required under the permit, must be trained on the permit and the facility's SWPCP.
A comprehensive education program must include:

- permit compliance;
- stormwater control measures used to achieve narrative TBELs;
- monitoring, inspections, reporting and documentation of these conditions; and
- spill response and good housekeeping practices.

Existing industrial facilities operating under the current permits already have control measures in place. They will need to evaluate these measures to ensure they are sufficient to meet the TBELs in this permit. The specific control measures used to meet the TBELs in this permit must be described in the SWPCP. At a minimum, permit registrants must meet the narrative technology-based effluent limits in the permit. Modifications or improvements to control measures may be made throughout the permit cycle to meet other conditions (for example, installing treatment measures based on Tier 2 corrective actions).

The permit also includes provisions to address noncompliance with the TBELs. If DEQ or the agent determines that a permit registrant failed to meet the TBELs as outlined in their SWPCP and in the permit, permit registrants must take corrective actions before the next storm event if practicable or no later than 30 calendar days, unless otherwise approved by DEQ or the agent. Schedule A.2, Control Measures for Numeric and Narrative Technology-based Effluent Limits contains this implementation deadline, which is reduced from 60 calendar days to 30 calendar days to require swift action to prevent failure of control measures prior to causing potential pollution of waters of the state.

3.2 Control Measures for Narrative and Numeric Technology-based Effluent Limits

3.2.1 Numeric Technology-based Effluent Limits

The TBELs in the permit are expressed as narrative limits. The settlement agreement signed Aug. 15, 2018, committed DEQ to evaluate the feasibility of numeric technology-based effluent limits for copper, lead, zinc and total suspended solids. Numeric effluent limitations were determined not to be feasible at this time for industrial stormwater discharges or protective of water quality. Stormwater discharges can be highly intermittent, are usually characterized by very high flows occurring over relatively short time intervals and carry a variety of pollutants whose source, nature and extent varies. The development of numeric TBELs for use in future 1200-Z permit reissuances would represent a substantial investment of resources by DEQ.

Numeric TBELs are developed via a rigorous process to identify pollutant control levels achievable with the best available technology and which are within the economic resources of each industry. Control technologies can vary widely both between industries (due to industry-specific factors) and within industries (due to site-specific factors). Site-specific variability is a highly salient feature in the analysis of stormwater controls, whereas it is much less likely to be a feature in the development of TBELs for wastewater permits. Examples of site-specific and industry-specific features, which might need to be accounted for in the development of numeric industrial stormwater TBELs, include: regional and seasonal climatic variation, rain intensity and duration, pollutant exposure pathways, available site area to implement controls and varying economic considerations for registrants. Given the level of variability inherent in the analysis inputs, it is possible—if not likely—that deriving numeric TBELs, which are broadly applicable to an industry, would be infeasible even with information collection efforts well beyond the scope of this permit.

EPA derives numeric TBELs used in its MSGP from the effluent limitation guidelines development processes. Were DEQ to attempt to develop industry specific numeric TBELs, it would consider modeling this process on EPA's ELG development process. EPA's ELG development process is a multi-year effort which involves substantial investment of resources by EPA and by industry for data collection and analysis. EPA issues two or more surveys to the relevant community of dischargers, which are used to collect detailed data regarding the site, the nature of pollutant generation activities, pollution control practices and technologies employed, their effectiveness and other relevant facts. This obligatory information collection effort requires non-trivial investments of time and resources by the regulated community and its consultants. EPA utilizes the resulting information to develop ELGs, if feasible and warranted. While EPA is continuously developing and revising its ELGs, only ten industries have industrial stormwater ELGs and nearly all of those limits were promulgated in the 1970s and 1980s, according the National Academy of Sciences 2019 Report, "Improving the EPA Multi-Sector General Permit for Industrial Stormwater Discharges." The limited number of successfully developed industrial stormwater ELGs is an indication of the difficulty and technical hurdles inherent in deriving adoptable numeric TBELs.

EPA established certain numeric technology-based effluent limits through EPA rulemaking. This is a multi-year process and very expensive and these numeric TBELs can be found in Schedule E, sector-specific requirements.

DEQ is continuously improving its data collection tools to improve the scope and quality of information available for compliance assessment and rulemakings, while minimizing or reducing reporting burden on permittees to the greatest extent practicable. DEQ will routinely evaluate available data, to determine if TBELs are feasible to develop, and will monitor EPA and other states routinely to see if adequate and feasible methods for numeric TBEL development have been identified.

3.2.2 Technologically Feasible

EPA determined that the industrial stormwater discharge permitting structure taken as a whole, constitutes Best Practicable Control Technology Currently Available (BPT), as set forth in CWA section 304(b)(1) and Best Available Technology Economically Achievable (BAT), as set forth in CWA section 304(b)(2) and Best Conventional Pollutant Control Technology (BCT), as set forth in CWA section 304(b)(4)[5]. EPA's 2021 MSGP effluent limits are expressed as specific pollution prevention requirements for minimizing the pollutant levels in the discharge. EPA added greater clarity and specificity in some of the effluent limits because in the past EPA's MSGPs were written in very general terms, leaving operators wide latitude in interpreting what constituted compliance. This led to widely varying levels of stormwater program effectiveness. EPA continues to assert that the combination of pollution prevention and structural management practices required by these limits are the best technologically available and economically practicable and achievable controls, as well as the most environmentally sound way to control the discharge of pollutants in stormwater discharges from industrial facilities.[6] As Oregon has been authorized to administer the NPDES permitting program by EPA, DEQ's permit continues to place pollution prevention as the cornerstone of the stormwater program.

Facilities must select, design, install, implement and maintain all control measures, BMPs and passive and/or active treatment to manufacturer's specification to ensure the control of pollutants.

3.3 Water Quality-based Effluent Limitations

3.3.1 Water Quality Standards

At any time, DEQ may require permit registrant to implement additional control measures or require permit registrants to obtain coverage under an individual permit, if a discharge causes or contributes to an exceedance of water quality standards. In cases where DEQ or agent impose additional controls, the permit registrant must revise their SWPCP. DEQ will post a 30-calendar day public notice on the revised plan.

[5] EPA 2021 MSGP Factsheet, page 30
[6] EPA 2021 MSGP Factsheet, page 30

Facilities are required to ensure that stormwater discharges do not cause or contribute to an exceedance of instream water quality standards in OAR 340-041, including the narrative criteria and aquatic life and human health criteria. DEQ expects that compliance with the technology-based limits, through the careful selection, design, installation, and implementation of effective control measures, as well the monitoring and corrective actions requirements in the permit, generally will result in discharges that are controlled as necessary to meet applicable water quality standards.

If the permit registrant becomes aware, or DEQ determines, that the discharge causes or contributes to a water quality standards exceedance, the permit registrant is required to take immediate corrective actions no later than 24-hours after the discovery and summarize corrective actions in a Water Quality Standards Corrective Action Report that is submitted to DEQ or the agent.

If the permit registrant determines that revisions to their SWPCP are necessary based on the corrective action review, the permit registrant must submit a revised plan to DEQ or agent with the report. These corrective actions must be implemented no later than 30 calendar days, unless additional time is approved by DEQ or the agent.

3.4 Discharges to Impaired Waters

DEQ changed the discharge to impaired waters section of the permit for ease of reading and clarity. Furthermore, DEQ or agent will specify and communicate impairment monitoring requirements based on EPA-approved Category 5: 303(d) list that is in effect at the time of permit assignment. For the purpose of this permit, impaired monitoring requirements are applicable to facilities that discharge directly enter into a Category 5 listed: 303(d) listed waters or indirectly through a storm sewer system or other conveyance for one or more of the following pollutants:

- pH
- copper
- lead
- zinc
- iron
- fecal indicator bacteria (E. coli, fecal coliform or enterococcus)

EPA regulations (40 CFR 130.7 and 40 CFR 130.8) specify the process for developing the 303(d) list and the content of the biennial water quality report. EPA guidance recommends that states submit an integrated report to satisfy 305(b) and 303(d) requirements. The methodology is consistent with the key elements of Oregon's water quality standards and is the framework DEQ uses to assess water quality conditions. The methodology builds on DEQ's protocols from previous 305(b)/303(d) assessments. The Integrated Report process is complete when DEQ receives approval from EPA on the final list of water quality limited waters requiring a TMDL (Category 5: 303(d) list).[7]

Category 5: 303(d) listed waters are determined when data indicates a designated use is not supported or a water quality standard is not attained and a TMDL is needed. This category constitutes the Section 303(d) list that EPA will approve or disapprove under the Clean Water Act. The 2018/2020 Integrated Report was approved by the U.S. Environmental Protection Agency on Nov. 12, 2020 and is now current and in effect; therefore, the 2018/2020 Integrated Report will be used for permit assignment for existing facilities and new facilities until the next biennial water quality report is approved by EPA.

DEQ has an online map to assist with the determination of impairment pollutant monitoring. Impairment monitoring is based on the first receiving water stormwater enters from each monitoring point. Each permit registrant is required to identify the latitude and longitude where the discharge enters the receiving stream. Since the new 2018/2020 listing methodology adjusted its assessment classification, the permit outlines the process for receiving streams within a watershed unit. These watershed units capture the smallest stream hydrologic

[7] DEQ's Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters, April 2020

classification areas in Oregon. The listing will only be applied if there is a hydrologic connection between the receiving water and assessment water body causing the impairment.

In addition to the map created specifically for the 1200-Z permit, the 2018/2020 Integrated Report may be accessed in an interactive web map application that displays status of an assessment unit. This is an effective method for facilities to provide DEQ or agent with information needed on site discharge and receiving water status. The interactive web map can be found here:
https://hdcgcx2.deq.state.or.us/Html5Viewer211/?viewer=wqsa

When a TMDL includes a wasteload allocation for a parameter-specific reduction in industrial stormwater discharge, DEQ will include such monitoring requirements at the time of permit assignment. The wasteload allocations will be expressed in any EPA-approved TMDL as outlined in the TMDL documents.

The 1998 EPA-approved Columbia Slough TMDL with specific wasteload allocations calling for a reduction of BOD_5 in industrial stormwater discharge. The permit reflects compliance with the terms and conditions the Columbia Slough TMDL for pollutants approved by EPA on November 25, 1998.

3.5 Stormwater Discharge

3.5.1 Statewide and Sector-Specific Benchmarks

The permit structure was changed by moving the benchmark table to Schedule B. This section explains the conceptual purpose of benchmarks. Statewide metals benchmarks are derived from water quality data and have been broken down by georegions. Georegion definitions come from EPA ecoregions. Statewide benchmarks reflect Oregon's regional water quality characteristics.

Sector E benchmarks are developed by EPA and have been adopted into the permit. Schedule E sector-specific benchmarks take into account specific pollutants likely to be mobilized from industrial sectors or activities. During this rulemaking, revisions were made to pollutant concentrations to reflect Oregon's water quality standards.

DEQ intends to address all discharges associated with industrial activity into a waterway or conveyance systems under the permit. Regulated stormwater discharges from a facility include stormwater run-on that commingles with stormwater discharges associated with industrial activity at a facility. Thus, all types of flow, including sheet flow, from industrial activity are considered part of the regulated flow. The concept is to regulate all stormwater pollution potential under the federal CWA and therefore, the permit registrant must assess all potential industrial stormwater discharge points that do not infiltrate. The EPA's *Industrial Stormwater Monitoring and Sampling Guide* (March 2009), and the State of Washington Department of Ecology's *Stormwater Sampling Manual* (December 2015) are both good resources for techniques on channeling and sampling sheet flow.

3.5.2 Mass Reduction Measures Certification

The Tier 2 mass reduction waiver is an alternative to installing stormwater treatment control measures, by instead reducing pollutant loads with volume reduction measures. Facilities that have implemented this condition have revised their SWPCP to include calculations to support the mass load analysis to reduce the mass of pollutants in discharge below the mass equivalent of the benchmark they were unable to meet.

"Federal requirements to report monitoring results for stormwater discharges associated with industrial activity… shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge."[8] At a minimum, a permit for such a discharge must require an annual report inspection and certification be signed in accordance with 40 CFR 122.22. The inspection must identify areas contributing to a stormwater discharge associated with industrial activity and evaluate whether measures to reduce pollutant loadings identified in a stormwater pollution prevention plan are adequate and properly implemented in

[8] 40 CFR 122.44(i)(4), Code of federal regulations, EPA Permit Programs, NPDES

accordance with the terms of the permit or whether additional control measures are needed. The permit complies with this federal requirement and goes beyond by providing a stamped certification by an Oregon registered professional engineer (PE) or Oregon certified engineering geologist (CEG) to validate the mass reduction measures are operating as designed.

The new framework provides an alternative to continued sampling requirements from mass reduction control measures that reduced the mass of the pollutants discharged at or above DEQ-approved design storm capacity. Sampling this discharge can be challenging, and because the results represented the mass rather than the concentration of the benchmarks, it was also difficult to appropriately evaluate sampling results. The certification deadline is December 31, 2021, for all approved mass reduction measures installed during previous permit cycles in response to Tier 2 corrective action. A later date may be requested, but all required maintenance identified within the certification must be complete by September 30, 2022.

To promote volume reduction measures, such as low impact develop practices (based on site conditions and potential for groundwater contamination), if a permit registrant has installed such mass reduction measures voluntarily that reduced the mass of the pollutants discharged at or above DEQ-approved design storm capacity, but not in response to Tier 2 mass reduction waiver, they may provide a certification and a Tier 2 mass reduction checklist retroactively.

If the certification is approved by DEQ or agent, the permit does not require permit registrants to conduct further sampling from mass reduction measures that may discharge subject to compliance with the stamped certification and proper operation and maintenance. Not all Tier 2 mass reduction measures are designed to discharge, such as on-site retention, re-use and stormwater diverted to sanitary sewer.

3.5.3 Effluent Limitations

This section simply describes effluent limitations and the instances they may apply to a discharger under the permit.

These include:

- Numeric technology-based effluent limits based on industrial activities promulgated by EPA's Effluent Limitation Guidelines under federal regulations 40 CFR, Subchapter N.
- Numeric water quality-based effluent:
    - Based on discharges to Category 5: 303(d) list in effect at the time of permit assignment for pH, copper, lead and zinc that correspond to the specific pollutant(s) for which the water body is impaired in response to monitoring results exceedance; and
    - Established by wasteload allocations in a TMDL as identified by DEQ or agent.
- Narrative water quality-based effluent limits based on discharges to Category 5: 303(d) list in effect at the time of permit assignment for E. coli and iron that correspond to the specific pollutant(s) for which the water body is impaired in response to monitoring results exceedances.

3.6 Preparation and Implementation of the Stormwater Pollution Control Plan

The SWPCP must be developed and permit registrants must maintain site-specific control measures designed to meet all applicable limits in Schedule A. Permit registrants are required to keep their plan up-to-date and follow all design, installation, implementation and maintenance specifications and frequency.

3.6.1 Stormwater Pollution Control Plan Requirement Revisions

DEQ is upgrading and streamlining our environmental data management system, Your DEQ Online. EPA published the NPDES Electronic Reporting Rule in October 2015. DEQ's electronic system will become the portal for all SWPCP revisions. Permit registrants in agents' jurisdictions will not immediately use the DEQ electronic system. Notification and training will be provided to all permit registrants and to the 377 industrial permit registrants administered by DEQ's agents once DEQ is aware of the timing of transition.

Your DEQ Online system provides a way to change site contacts through the electronic system instead of uploading the revised SWPCP. Facilities will still be required to update the on-site paper copy within 30 calendar days from the change at your facility. All other SWPCP revisions will be submitted through the electronic system once training has been provided, unless a waiver from electronic reporting has been granted.

For existing permit registrants continuing coverage from the 2018 permit, SWPCP revisions must be updated to reflect permit changes and submitted to DEQ or agent no later than August 31, 2021.

3.6.2 Stormwater Pollution Control Plan Required Elements

The title page requirements include: (1) plan date; (2) name of site; (3) name of site owner or operator; (4) DEQ file number and EPA permit number; (5) primary and co-located SIC code; (6) contact person name, phone and email(s); and (7) physical and mailing address, if different.

The EPA permit number is listed on registrant's permit coverage documents and, when DEQ shifts to electronic reporting, this number will be used and not DEQ's file number. It is important the SIC code applicable to the drainage areas and associated discharge points be noted in the SWPCP, since sections of the site's industrial activities may vary.

The plan must clearly label on the site map all discharge points. Because monitoring location may differ from the actual discharge point, the map must contain both. Monitoring location must be labeled with a unique three-digit identifying number starting with 001, 002 and indicate "monitoring location."

A requirement to include the locations, description and any available characterization information on known or discovered significant materials from past industrial practices, must include any toxic substances classified under TSCA to assist in ensuring these areas are controlled, covered or removed when they contribute contaminants to stormwater discharges. The definition of significant material may be found in Schedule D.

There is a new requirement to provide safety data sheets or any stormwater treatment chemicals or substances used in stormwater treatment and stored on site.

The SWPCP must provide the name(s) of the receiving water(s) and latitude and longitude of discharge points and applicable SIC code, if facility has co-located operations. If the discharge point is into a municipal storm sewer system, the name(s) and latitude and longitude of the ultimate receiving water(s) and the name of the municipality is required. Because this permit has reduced the impairment pollutants applicable for monitoring and facilities may be subject to a numeric water quality-based effluent limit, it is critical that DEQ or agent know the appropriate receiving stream of each monitoring point.

Operations and maintenance plans are a required element of the SWPCP for active and passive stormwater treatment systems, as well as all mass reduction measures or Low Impact Development. Proper function and maintenance for treatment elements with sophisticated or proprietary components or thresholds must be met for system efficacy. Just as maintaining treatment system components for optimal performance, Low Impact Development features must be maintained and cleaned to retain infiltration rates and capacity.

3.7 Benchmark Exceedances Corrective Actions

3.7.1 Tier 1 Corrective Actions

This permit is based on an adaptive management approach where permit registrants monitor their stormwater discharge, evaluate the effectiveness of their control measures and take corrective actions to ensure that pollutants exposed to stormwater are controlled to achieve the benchmarks in the permit and to protect water quality. When stormwater monitoring results exceed any statewide benchmark(s) in Table 4 of the permit or sector-specific benchmark(s) in Schedule E, the permit registrant must investigate the cause no later than 30 days after receiving the monitoring results.

A single exceedance of a statewide benchmark or sector-specific benchmark triggers a Tier 1 investigation and a Tier 1 report. The corrective actions process include the following steps: investigate the cause of the exceedance, evaluate the use of best management practices, implement indicated corrections and document the actions in a Tier 1 report. Tier 1 investigation is primarily focused on source control, best management practices and implementing new narrative technology-based effluent limits (TBELs), such as housekeeping and minimization of exposure.

The permit structure was changed to breakout the triggering event, corrective action and reporting, deadlines and exemptions.

The investigation of elevated pollutant levels potentially including source tracing activities may be required under this permit. This is intended to assist facilities in earlier discovery of significant materials left on-site from past activities or other discrete pollutant sources, such as metal roofing. In this way, facilities can plan for removal or isolation of sources as a Tier 1 corrective action, incentivizing avoidance of triggering Tier 2 corrective actions.

To provide technical assistance to facilities, DEQ will provide specific source control and operation control options based on each major industrial group on DEQ's industrial stormwater webpage. This optional tool is in the form of checklists to be completed as part of the Tier 1 corrective action response. The checklists were developed by EPA and included in the 2020 draft MSGP as Appendix Q. EPA did not include Appendix Q in the 2021 MSGP and maintains the existing industrial stormwater fact sheet series as guidance. DEQ's draft 1200-Z permit released for public notice mid-Aug. 2020, proposed to adopt Appendix B equivalent to EPA's Appendix Q. Similar to EPA, after reviewing comments received during the public notice period, and reconsidering the applicability of the Appendix B requirements to individual industries, DEQ did not retain Appendix B in the 1200-Z permit. However, DEQ revised the checklists in response to public comments and re-structured the checklists to minimize duplication and eliminate control measures already required under Schedule A.1, narrative TBELs. In recognition of the benefit to permit registrants, the checklists can be used to reduce pollutant sources known to be mobilized from specific industries, if Tier 1 investigation did not reveal an obvious corrective action response. The checklists are broken into universal source control measures to be completed and implemented at all sites and industrial-specific options based on the industry sector. In developing the checklists, EPA reviewed potential pollutants from common industry activities, pollutant sources and practices that could reduce pollutant discharges. DEQ made significant edits to EPA's original Appendix Q. Because the checklists are no longer required, if the checklists contain measures that may not be appropriate for a particular facility, the action is not required and the facility may simply note the reason for the action being inappropriate on the checklist.

If a permit registrant choses to use the industrial-specific checklists, applicable controls should be implemented based on each primary and co-located SIC codes operational on-site. The universal source control measures will be applicable for industrial activities under Table 2.

Tier 1 is applicable to statewide benchmarks and sector-specific benchmark exceedances. Impairment pollutant monitoring exceedances no longer have a tiered corrective action response because DEQ has applied a new structure specific to Category 5: 303(d) list impairment exceedances. It is in the interest of the permit registrant to make every appropriate modification on site in response to an impairment exceedance prior to permit monitoring escalating to a numeric water-quality based limit or triggering narrative water-quality based limits. The escalating nature of the response imposes its own corrective action timeline and facilities must reduce impairment loading because the receiving water has no assimilating capacity.

A Tier 1 corrective action response is not required for permit registrants subject to Tier 2 corrective action response, when monitoring results exceed the benchmark for the same pollutant and monitoring point prior to Tier 2 treatment and source control measures are installed.

Preventing stormwater from contacting pollutants (i.e., source control) is generally more effective and less costly than removing pollutants once they have mobilized in stormwater as required by Tier 2.

Some examples of effective Tier 1 source control responses may include:

- removal or isolation of pollutant source;
- minimizing impervious areas allowing infiltration;
- reducing flows through swales or buffers;
- installing and implementing industrial-specific checklists; and
- increased frequency street sweeping.

Tier 1 reports are integral for DEQ inspectors and agents when evaluating permit compliance. Tier 1 reports and industrial-specific checklists must be retained on-site with the permitting records and are required to be kept for a minimum of three years. DEQ or agent will review them during inspections.

Facilities must investigate the causes of elevated monitoring results, review SWPCP and evaluation control measures, determine if changes are needed or SWPCP revision is necessary, complete Tier 1 report and implement corrective action no later than 30 calendar days. The corrective action implementation deadline must be completed before the next storm event, if possible, or no later than 30 calendar days after receiving the monitoring results, whichever comes first. If there is a known source of stormwater contamination, fulfilling Tier 1 corrective action response no later than 30 calendar days is fundamental to adaptive management. If permit registrant fails to complete the corrective action within this timeframe, the explanation must be documented in the Tier 1 Report.

3.7.2 Tier 2 Corrective Actions

This requirement is based on the geometric mean of qualifying sample results collected during any full reporting year at any monitoring point(s) that exceeds applicable statewide benchmark(s). Tier 2 is only required for statewide benchmark exceedances. However, if a discharge point is subject to impaired water quality criteria or numeric water quality-based effluent limit for a parameter that also has a benchmark, Category 5: 303(d) listed water exceedance response supersedes Tier 2. For instance, if a facility discharges into a 303(d) listed stream for copper, the facility would not be assigned total copper benchmark based on georegion, rather the permit registrant will follow the conditions related to impairment monitoring in the permit; including Schedule A.13 and Schedule C, compliance schedule, corrective action responses based on exceedances.

Treatment is necessary as part of Tier 2; however, this may include a combination of treatment measures and source control. Sole source control improvements should be conducted during Tier 1 corrective action responses with the objective of not exceeding the geometric mean.

Because this permit was issued early, many of the second-year Tier 2 evaluations resulted in implementations dates after the 2021 permit issuance date. Therefore, facilities with Tier 2 installation deadline of June 30, 2021, or later in response to a Tier 2 corrective action response triggered under 2018 permit, are relieved from Tier 2 evaluation for the same pollutant(s) and monitoring point(s) that previously triggered Tier 2 during this permit cycle.

This permit no longer includes the Tier 2 evaluation required once per permit term during the second year. Although, Tier 2 corrective action response is not required more than once a permit term for the same pollutant(s) and any monitoring point(s), each August 15 the permit registrant must report the geometric mean calculation of the benchmarks from each monitoring point. The geometric mean calculation is not required for any pollutant or monitoring point already in Tier 2 status under the renewed permit or for Tier 2 installation date on or after June 30, 2021, from the previous permit cycle (2018 permit). Permit registrants must be diligent to ensure that monitoring results meet the benchmarks to eliminate costly evolving treatment requirements throughout the permit term.

Tier 2 status begins on June 30 of any year when the sample results from the previous full reporting year exceeds the geometric mean. This means that even though DEQ or agent will not be aware of any facilities' monitoring has triggered Tier 2 corrective action response, the facility needs to calculate the geometric mean as soon as they receive the monitoring results. Most of the time facilities will know their status before June 30 (the end of the full

reporting year) because the fourth required sample to meet the minimum sampling frequency will likely have been taken prior to the end of the full reporting year. Facilities are encouraged to start the required corrective action as soon as they are aware their sample results have triggered Tier 2 corrective action.

When a facility analyzes more than the minimum qualifying samples during a full reporting year, those samples must be used in the geometric mean calculation to evaluate Tier 2 status. Samples must be taken at least 14 days apart. A definition for a storm event has been included in Schedule D.

The Tier 2 report or allowed exemptions (Tier 2 mass reduction waiver and Tier 2 background waiver), become a part of the SWPCP and must be stamped by an Oregon professional engineer or Oregon certified engineering geologist. An Oregon certified engineering geologist may stamp only the Tier 2 mass reduction waiver.

Oregon Revised Statute Chapter 672 requires that anyone offering to practice as an engineer in Oregon be registered in Oregon and hold a valid certificate to practice engineering in Oregon from the Board of Examiners for Engineering and Land Surveying. Although it is not DEQ's role to enforce this statute, restating the Oregon registration requirement in the permit provides greater clarity. Questions regarding ORS 672 should go to the Board of Examiners for Engineering and Land Surveying.

If a treatment system uses chemicals to adjust the stormwater to assist in optimal treatment and this is included in the approved manufacturer's operation and maintenance section of the revised plan, treated stormwater is not considered process water. This permit requires that a safety data sheet is also included in the plan for any stormwater treatment chemicals used and stored on site.

In determining the appropriate treatment measures, facilities may consider passive or active treatment measures. Facilities should first consider using volume reduction measures such as Low Impact Development practices, if feasible based on-site conditions and potential for groundwater contamination. In addition, source control measures can be used in conjunction with treatment best management practices to effectively address the pollutants of concern. Control measures can be actions (including processes, procedures, schedules of activities, prohibitions on practices and other management practices) or structural or installed devices to prevent or reduce water pollution. Thus, the definition of "control measures" includes both best management practices and "other methods" used to prevent or reduce the discharge of pollutants to receiving waters. Treatment removes pollutants from stormwater. Some examples of methods to remove pollutants from stormwater include the following active and passive methods.

Active treatment systems require electricity to operate. Within the active treatment system category, there are the following**:**

- Chemical filtration
- Chemical treatment
- Electrocoagulation
- Filtration
- Ion exchange
- Reverse osmosis

Passive treatment systems do not require electricity to operate and are generally lower cost alternatives when compared to active treatment systems. Within the passive treatment system category, there are the following:

- though /filtration
- Drain inlet insert
- Hydrodynamic separation
- Media filtration
- Absorbent boom/fabric
- Oil/water separator[9]

[9] Literature Review of Existing Treatment Technologies for Industrial Stormwater, Herrera July 2011, page 4, 5.

DEQ and agents are committed to reviewing and notifying facilities no later than 60 calendar days of receipt if either the Tier 2 report or Tier 2 mass reduction waiver request is accepted or denied. Permit registrants must inform DEQ or agent of confirmation of the final implementation date no later than 30 calendar days after installing all Tier 2 corrective actions. This will allow DEQ or agent to evaluate compliance with the Tier 2 corrective action requirements and monitoring waiver requests submitted post Tier 2 implementation. This will likely be done through the electronic reporting system.

DEQ extended the implementation deadline to allow facilities more "dry weather" time for implementation of Tier 2. The deadline for installation of Tier 2 corrective action is now September 30 (a year and nine months from Tier 2 corrective action proposal response submittal deadline).

Monitoring waivers for the pollutants that exceeded the geometric mean at their associated discharge points are not allowed until post-Tier 2 installation. A monitoring waiver may be requested when the geometric mean of five consecutive qualifying samples is equal to or below the applicable statewide benchmark, or pH results are within the range for five consecutive qualifying readings. Once Tier 2 corrective action is installed and operable, a permit registrant must wait a full monitoring year and meet the monitoring waiver criteria prior to requesting a monitoring waiver for the same pollutants and discharge points that triggered Tier 2.

At approved substantially similar discharge points, facilities must evaluate appropriate source control and treatment to correctly size and install Tier 2 corrective actions at these discharge points. This requirement takes into account the original evidence for discontinuing monitoring at substantially similar outfalls with similar effluent, which were the industrial activity, nature of pollutants and supporting analysis proved the stormwater is of similar composition. DEQ acknowledges the size of the basin may vary. Therefore, installing the proper sized treatment is critical. Once Tier 2 installation is complete, permit registrant must monitor all substantially similar discharge points. For exceptionally large facilities where sampling at all substantially similar discharge points are infeasible, DEQ or agent may approve a modified monitoring schedule.

Substantially similar discharge points applies to those discharge points claiming similar effluent from drainage areas serving comparable activities where the discharge was not previously monitored due to similar composition. Any other discharge point(s) not determined to be substantially similar to the Tier 2 triggered monitored discharge point(s) may continue to operate under a monitoring exemption. All other parameters which did not exceed the geometric mean at the monitored discharge point(s), at those substantially similar discharge points claiming to have similar effluent(s) discharges may also continue to operate under a monitoring exemption.

3.7.3 Tier 2 Mass Reduction Waiver

Tier 2 mass reduction waiver is based on volume reduction and can be done in many ways. Most of the time permit registrants choose to reduce the mass load of pollutants in the discharge below the mass equivalent by infiltration. Some may re-use the stormwater and others may choose to send a portion to the sanitary sewer. The underlying concept of this waiver is that by infiltrating the first flush of runoff, when the highest pollutant concentrations occur, less loading makes it to surface waters. In doing so, green infrastructure and volume reduction measures will sufficiently reduce the mass load of pollutants entering the receiving stream. To obtain this mass reduction waiver, the permit registrant must demonstrate that the volume reduction measures are below the mass equivalent of the benchmarks.

Since this condition was in the permit for two cycles, many permit registrants have installed these type of mass reduction measures. This permit includes changes related to mass reduction measures that are installed based on Tier 2 mass reduction waiver corrective action responses in previous years. For facilities newly triggering Tier 2 corrective action under this permit cycle, the Tier 2 mass reduction waiver was changed very minimally.

There are new provisions around mass reduction measures in the permit. Provisions include a conditional exemption from monitoring if a permit registrant has monitoring results. Since the benchmarks are concentration based, the mass equivalent data does not need to be included in geometric mean calculations. These provisions apply to both previously approved mass reduction measures that reduced the mass of pollutants at or above DEQ-

approved design storm capacity under a Tier 2 corrective action response, measures installed proactively and any mass reduction measures installed during this permit cycle. All measures must be properly maintained and those measures installed during previous permit cycles must comply with the new mass reduction measure certification.

3.7.4 Tier 2 Background Waiver

Some facilities that have exceeded the benchmark based on the geometric mean evaluation may demonstrate that these exceedances are due to background conditions. For example, high background levels of metals in soils or groundwater due to natural mineral deposits could cause a benchmark exceedance. Background sources include metals derived from natural mineral deposits and nutrients attributable to background soil, vegetation or wildlife sources. Background sources may not include run-on from non-natural sources, such as other industrial sites or roadways. Consistent with EPA's permit, the 1200-Z permit includes a waiver if facilities establish that benchmark exceedances are solely due to background conditions. To make this determination, the permit registrant must sufficiently demonstrate the benchmark exceedance(s) is attributed solely to the presence of the pollutant(s) in natural background and is not associated with industrial activities at the site. The updated SWPCP must include any data collected, including literature studies, that describes the levels of natural background pollutants in the discharge. DEQ's website includes a fact sheet for establishing background conditions to assist facilities with determining if this exception is applicable.

"DEQ's Determining Background Conditions Fact Sheet[10]" provides the requirements to support a rationale for a background waiver:

- Map showing the reference site location in relation to facility and elevation;
- Reference site and facility site elevation;
- Available geology and soil information for reference and sampling sites;
- Photographs showing available land cover information and site vegetation;
- Site reconnaissance survey data regarding presence of roads, outfalls, or other human-made structures;
- Reference site reconnaissance survey data regarding presence of roads, discharge points, or other human-made structures;
- Monitoring data;
- Information from peer-reviewed publications;
- Data from a local, state, or federal government publication specific to runoff or stormwater in the immediate region; and
- Records from relevant state or federal agencies indicating no known mining, forestry, or other human activities upstream of the proposed reference site during the time the record collection occurred.

The background concentration of a pollutant in discharges from a non-human-impacted reference site in the same watershed should be determined by evaluating ambient monitoring data or by using information from a peer-reviewed publication or a local, state or federal government publication specific to stormwater in the immediate region.[11]

3.8 Category 5: 303(d) Listed Waters Exceedance Response

3.8.1 Water Quality-based Effluent Limits

As previously discussed, facilities are required to ensure that the discharge of industrial stormwater does not cause or contribute to an excursion of instream water quality standards in OAR 340-041. DEQ expects that compliance with the technology-based limits in the permit will generally result in discharges that are adequately controlled to meet applicable water quality standards. However, discharges to impaired waters on Oregon's 303(d) list that continue to exceed impairment monitoring after the implementation of typical pollutant controls or treatment may have the potential to cause or contribute to exceedances of applicable water quality criteria within the receiving water.

[10] https://www.oregon.gov/deq/FilterDocs/wqstorm-backgrdet.pdf
[11] EPA 2021 MSGP Factsheet, page 111

DEQ compiled stormwater data reported on the 1200-Z permit Discharge Monitoring Reports from January 2000 through December 2018 to evaluate which pollutants in industrial stormwater are most likely to cause or contribute to exceedances of water quality standards within impaired waters. Discharge data was cross-referenced with Oregon's 303(d) list, approved by EPA in December 2018, to narrow the assessment to pollutants that are known to be causing impairment within Oregon's receiving waters. Discharge data was then separated based on georegion (i.e., Columbia River, Columbia Slough, Portland Harbor and Regional) and compared to the water quality-based georegion reference concentrations. EPA's default metal's translators were used in calculating the dissolved data to total metals for this analyses.

A reference concentration was the term used for impairment concentrations. Reference concentrations for many of the impairment pollutants were based on the acute aquatic life criteria; where acute criteria were not applicable, chronic aquatic life criteria was used. There were approximately ten toxic pollutants without aquatic life criteria and DEQ established impairment monitoring concentrations using the human health criteria for these pollutants. In instances where the quantitation limit is above the water quality criteria, the quantitation limit was used as the reference concentration.

Toxic pollutants that were identified as present in industrial discharges at concentrations that exceeded the reference concentrations at a frequency of 10 percent or greater were identified: cadmium, copper, iron, lead, and zinc. Cadmium was not included as an impairment of concern because there is only one stream segment assessed as Category 5: 303(d) listing in the 2018/2020 Integrated Report and there are no permitted industrial facilities as the listing is for the Middle Creek located in a high elevation area. Additionally, E. coli was evaluated as a pathogen indicator using a water quality standards instantaneous criterion of 406 counts/100 ml. For pH, a minimum reference of 6.5 to 7.0 standard units and a maximum reference of 8.5 to 9.0 standard units were used. Exceedances of both E. coli and pH (minimum of the range) were identified as occurring at a frequency greater than 10 percent of the time. Therefore, the permit has narrowed the impairment requirements and monitoring to pH, copper, lead, zinc, iron and fecal indicator bacteria, E. coli, fecal coliform and enterococcus.

While other toxic, non-toxic and conventional pollutants were evaluated, no other pollutants were identified as present in industrial stormwater discharges to impaired waters and potentially exceeding water quality-based reference concentrations at high frequencies. Based on the analysis, DEQ established numeric water quality-based effluent limits for the following pollutants that may contribute to an exceedance: pH, total copper, total lead and total zinc. Narrative water quality-based effluent limits were established for exceedances of total iron and E. coli. Permit registrants that discharge into Category 5: 303(d) listed waters for fecal coliform and enterococcus, are required to sample and report data.

Impairment monitoring and numeric water quality-based effluent limits for pH are established consistent with the applicable water quality criteria defined in OAR 340-041-0021 and -0101 through -0350. These are included in the permit in Appendix A.

Water quality-based effluent limits for total copper, total lead and total zinc are required for permit registrants that are identified as discharging pollutants at concentrations that may contribute to exceedances of water quality criteria. Stormwater permits often rely on adaptive management approaches, which use data to evaluate the effectiveness of existing BMPs and identify the need for additional control measures to protect water quality. The approach selected by DEQ for permit registrants discharging to Category 5 impaired waters provides an opportunity for effective adaptive management. However, if two consecutive exceedances occur or the magnitude of the exceedance is greater than a factor of two, water quality-based effluent limits are required to protect water quality.

DEQ calculated the applicable numeric criteria for total copper, total lead and total zinc based on the acute aquatic life criteria defined in Table 30 of OAR 340-041-8033. Acute aquatic life criteria were selected because the associated duration of the criteria aligns with the short duration of water quality impacts associated with stormwater discharges. Comparatively, chronic aquatic life criteria's duration is 4 days, and human health criteria is multiple decades and thus not appropriate for controlling impacts of stormwater discharges on receiving waters.

The acute criteria for total lead and total zinc are formula based, dependent on receiving water hardness. To calculate an applicable hardness for these pollutants, the data was evaluated based on seven georegions (i.e., Columbia Slough, Portland Harbor, Cascades, Costal, Columbia River Mainstem, Eastern and Willamette Valley). The median georegion hardness was identified and used to calculate the applicable water quality criteria for total lead and total zinc, within the corresponding georegions. In addition, DEQ computed the shape and scale parameters of the lognormal distribution by computing the mean and standard deviation for the log transformed data. This is called "maximum likelihood estimate" of the parameters and was applied in cases of lognormal distributions.

The numeric acute aquatic life criteria for copper is derived from the formula-driven Biotic Ligand Model, accounting for numerous variables/characteristics of the receiving water. Receiving water data was evaluated based on the seven defined georegions, and the 10^{th} percentile of the data was used to determine a conservative numeric criterion for the corresponding georegions.

40 CFR 122.45(c) requires that all permit limits, standards or prohibitions for metals be expressed in terms of "total recoverable metal." This assures that regardless of the characteristics of the receiving water, the resulting percentage of the metal that is dissolved after mixing with the receiving water will not exceed the applicable dissolved criteria and will be protective of aquatic life. The values provided in Table 5 for copper, lead and zinc are total recoverable.

Numeric water quality criteria for enterococcus and fecal coliform defined in OAR 340-041-0009 are expressed as monthly geometric means and percent exceedances. Due to the unpredictable frequency and duration of storm events and any resulting discharges, these criteria are not directly transferable to realistic and effective effluent limits for stormwater. Historically the permit has used E. coli as a surrogate for enterococcus and fecal coliform. This was determined to be an inappropriate application of surrogate monitoring. Since it is important for bacterial indicators associated with public health and water quality, enterococcus is the appropriate pathogen for sampling purposes for marine discharger and in estuarine waters fecal coliform is often used. DEQ or agent will assign permit registrants that discharge 303(d) list receiving waters the appropriate bacterial indicator from the approved EPA-approved Integrated Report. If this is enterococcus or fecal coliform, monitoring will be required four times a year as report only. This means no specific concentration will be assigned and the data will be evaluated against the water quality standards for TMDL development and future permit cycles. Since these bacterial indicators are associated with beach closure or shellfish harvest, DEQ may require additional narrative water quality-based effluent limits, if a public health risk is identified from the discharge.

Water quality criteria for E. coli is expressed as a monthly geometric mean and a single sample maximum. The geometric mean criterion is not directly transferable to an effective effluent limit for stormwater discharges. However, evaluating consistency with the single sample maximum criterion for E. coli is possible for stormwater discharges. This permit establishes narrative requirements to consistently achieve a single sample maximum of 406 colonies per 100 ml for E. coli. Permit registrants discharging to impaired waters are required to use an effective adaptive management. However, if consecutive exceedances of the applicable water quality criteria occur, specific water quality-based effluent limits are required to address potential sources of stormwater runoff contamination.

The permit provides 90 calendar days for a permit registrant to implement narrative water quality-based effluent limits after receiving monitoring results to provide necessary time to carry out the required actions. Some of the narrative water quality-based effluent limits are on-going.

Oregon does not have acute aquatic life criteria for iron that would be applicable for the short-term impacts of stormwater discharges on a receiving water. Further, Oregon has been unable to identify compelling evidence that acute impacts occur due to iron within receiving waters. However, the discharge of stormwater, containing iron, may contribute to pollutant loading that persists beyond the duration of the stormwater discharge duration. DEQ has used an acute-chronic ratio (ACR) of 10 to address the potential acute impacts of iron and mitigate pollutant loadings that may contribute to impairments of the chronic aquatic life criteria. An ACR expresses the

relationship between a toxicant causing acute toxicity and a toxicant causing chronic toxicity. In EPA's 1991 Technical Support Document, EPA recommends the use of measured ACR, but in the absence of data to develop an ACR, EPA's data suggests that an ACR of 10 could be used and represents the upper 90th percentile of all ACR data. The numeric chronic aquatic life criteria for iron specified in OAR 340-041-8033 is 1 mg/L. Using an ACR of 10, an acute aquatic life criteria of 10 mg/L has been established.

This permit establishes narrative water quality-based effluent limits requirements if monitoring results of iron exceed 10 m/L two consecutive times during the permit term. Registrants discharging to impaired waters are required to use an effective adaptive management. The permit provides 90 calendar days for a permit registrant to implement narrative water quality-based effluent limits after receiving monitoring results to provide necessary time to carry out the required actions. Some of the narrative water quality-based effluent limits are on-going. Completion of narrative water quality-based effluent limits will be documented and verified by DEQ or agent in the revised SWPCP required to be submitted 30 calendar days after the change to operation or control measures. A total of 120 calendar days are allowed to complete the narrative limits and submit a revised SWPCP.

Although the permit includes impairment concentrations for all seven georegions for total copper, total lead and total zinc, including marine waters concentrations, permit registrants are only subject to numeric water quality-based effluent limits if the receiving water body is on the 303(d) list. If monitoring triggers a numeric water quality-based effluent limit the permit registrant must notify DEQ or agent no later than 30 calendar days from receiving the monitoring results and at that time make a request for up to a two-year compliance schedule if needed.

3.9 Permit Compliance

3.9.1 Authorization Under This Permit

Any noncompliance with any of the requirements in the permit constitutes a violation of the federal CWA. This permit added our state authority under Oregon Revised Statues (ORS) 468B.025(2). The state definition of waters of the state is more comprehensive than the federal definition of Waters of the United States.

Even if a facility is conducting corrective actions based on a violation, this does not absolve the permit registrant of the initial underlying violation. For example, if a facility violates a narrative technology-based effluent limit, correcting the violation does not remove the original violation. DEQ also clarified that where corrective action is triggered by an event that does not itself constitute a violation, such as a benchmark exceedance, the registrant may avoid a permit violation provided that the permit registrant takes the corrective action within the deadlines identified in the permit.

If a facility is implementing control measures that require capital improvements, the facility must include these measures in an implementation schedule in the SWPCP and complete the improvements no later than two years of receiving permit coverage. Capital improvements are defined in the permit as the following improvements that require capital expenditures: (1) treatment best management practices including but not limited to settling basins, oil/water separation equipment, catch basins, grassy swales, detention/retention basins, and media filtration devices; (2) manufacturing modifications that incur capital expenditures, including process changes for reduction of pollutants or wastes at the source; (3) concrete pads, dikes and conveyance or pumping systems utilized for collection and transfer of stormwater to treatment systems; (4) roofs and appropriate covers for manufacturing areas, and (5) removal or permanent isolation of significant materials left from previous activities, and (6) volume reduction measures such as Low Impact Development control measures. The installation of volume reduction measures are considered a capital improvement.

4.0 Schedule B - Monitoring Requirements

Schedule B of the permit contains the following requirements:

All Monitoring Tables
- Numeric Effluent Limitations Based on Effluent Limitations Guidelines
- Statewide Benchmarks
- Impairment Monitoring Concentrations and Numeric Water Quality-based Effluent Limits
- Impairment Monitoring Concentrations

Monitoring Requirements
- Pollutant Parameters
- Sampling Procedures
- Monitoring Frequency Table
- Monitoring Variance
- Monitoring Waiver

Inspections

Reporting and Recordkeeping Requirements
- Reporting Monitoring Data
- Discharge Monitoring Reports Submission; DMR Submission Deadlines Table
- Exceedance Report for Numeric Effluent Limits
- Record Keeping Procedures

4.1 Monitoring Tables

4.1.1 Numeric Technology-based Effluent Limits

The permit includes numeric effluent limits based on ELGs for certain industry-specific discharges (see specific citations for federal limitations in Table 3 below). The ELGs below are specified in the sector specific requirements in Schedule E of the permit. No changes were made to this table except to runoff to discharge from… "the regulated activity."

Table 3. Numeric Effluent Limits based on Effluent Limit Guidelines

Regulated Activity	40 CFR Part/Subpart	Effluent Limit
Discharge from asphalt emulsion facilities (co-located SIC code only, 2951 covered under the 1200-A)	Part 443, Subpart A	See Schedule E.D.2
Discharge from material storage piles at cement manufacturing facilities	Part 411, Subpart C	See Schedule E.E.5
Discharge from hazardous waste landfills	Part 445, Subpart A	See Schedule E.K.3
Discharge from non-hazardous waste landfills	Part 445, Subpart B	See Schedule E.L.7
Discharge from coal storage piles at steam electric generating facilities	Part 423, Subpart E	See Schedule E.O.4

Regulated Activity	40 CFR Part/Subpart	Effluent Limit
Discharge containing urea from airfield pavement deicing at existing and new primary airports with 1,000 or more annual non-propeller aircraft departures	Part 449, Subpart S	See Schedule E.S.7

4.1.2 Statewide Benchmarks

DEQ made the following changes to the benchmarks in the permit:

- Re-evaluated metals benchmarks including modeled saltwater benchmarks. The freshwater copper benchmarks were re-evaluated to be consistent with the aquatic life criterion for copper which requires use of the biotic ligand model based on evaluation of several different water quality parameters. Changes to the freshwater zinc and lead benchmarks are based on a re-assessment of the risk-based water quality modeling (See Appendix A).
- Did not assess technological feasibility in final benchmarks based on water quality criteria.
- The Columbia Slough biological oxygen demand, or BOD_5 benchmark was reduced from 33 mg/L to 24mg/L.
- The oil and grease benchmark was removed. The data shows compliance with this benchmark and DEQ determined it is inconsistent with water quality criteria and is not a good indicator of pollution. The presence of a visible sheen is a reliable and effective approach to assessing compliance with the applicable water quality criteria. Permit registrants will continue to conduct a Tier 1 response to any monthly visual inspections that show a visible oil sheen. Additionally, the removal of the oil and grease benchmark is consistent with EPA's 2021 MSGP.
- Expanded the georegions for accuracy of metals benchmarks and numeric water quality-based effluent limits among regional characteristics, including applied regional translators where appropriate.
- Moved E. coli under Schedule E applicable to specific sectors.

The permit registrant must monitor stormwater discharges for the benchmarks in Table 4. In addition permit registrants must monitor for any sector-specific benchmarks in Schedule E.

Table 4. Statewide Benchmarks

Georegion	pH s.u.	Total Copper mg/L	Total Lead mg/L	Total Zinc mg/L	TSS mg/L	BOD mg/L	Total Phosphorus mg/L	E. coli organism/100 mL
Columbia Slough	5.5-9.0	0.017[2]	0.10[2]	0.24[2]	30	24	0.16	406[1]
Portland Harbor	5.5-9.0	0.015[2]	0.24[2]	0.24[2]	30			
Cascades	5.5-9.0	0.016	0.018	0.068	100			
Coastal	5.5-9.0	0.017	0.039[2]	0.086	100			
Columbia River Mainstem	6.0-9.0	0.023	0.21	0.35	100			
Eastern	5.5-9.0	0.031	0.077[2]	0.16	100			
Willamette Valley	5.5-9.0	0.015[2]	0.11[2]	0.14[2]	100			
Marine Waters	6.0-9.0	0.025	1.10	0.46	100			

[1]Columbia Slough dischargers are only subject to benchmark monitoring, no impairment monitoring
[2]Applied regional translators

An in-depth description of the metals benchmark process can be found in Appendix A. DEQ hired PG Environmental to assess the benchmark methodology used in the 1200-Z permit. It was determined that the benchmark methodology used aligns with EPA's approach and is defensible. However, it was determined the

technological feasibility evaluation conducted for some prior permits was not robust enough and did not evaluate the discharge quality from the best performing sites. Further, benchmarks are used to ensure compliance with applicable water quality criteria, and a technological feasibility analysis is not appropriate. DEQ has built in flexibility into the risk-based modeling to account for the intermittent nature of stormwater discharge. As outlined in the federal process for technological feasibility, the appropriate evaluation would include a selection of model technologies, a defined performance standards, and set a benchmark at a concentration based on best treatment capabilities. DEQ calculated and applied regional translators where appropriate based on dissolved to total paired metal data. An in-depth description of the regional translator process can be found in Appendix C.

As part of the 2021 rulemaking, PG Environmental also conducted a careful review of the Columbia Slough TMDL, GIS-shape files of land use discharging into the Columbia Slough watershed, and historical calculations by DEQ and other jurisdictions' reports. The purpose of the in-depth assessment was to determine if the increase in permitted industrial facilities land use matched the calculations for remaining loading capacity in the original 1998 TMDL. The TMDL establishes industrial stormwater wasteload allocations, and DEQ must determine that there is sufficient remaining loading capacity in the TMDL to allow for the new industrial stormwater discharge.

The TMDL provides for a 50 percent increase in BOD loading from the all stormwater discharges, but does not appropriate any portion of that reserve capacity to any type of stormwater discharge. In other words, that 50 percent can be used by any land use. PG Environmental recommended reducing the BOD_5 in the Columbia Slough watershed to maintain a similar overall load to the Columbia Slough. Based on land use acres, previous applicable land area was ~2,702 acres (587 kg/day), which has grown to 3,816 acres (830 kg/day). Adjusting the benchmark to 24 mg/L brings that loading to back to 603 kg/day, similar to the wasteload allocation-based loading previously considered and well within the available reserve capacity. This retains the current BOD loading for the larger land area (~103% of existing allowable loading), protecting the reserve capacity available within the TMDL for continued growth. In addition, a review of recent data showed that the vast majority of dischargers will be able to meet the 24 mg/L benchmark.

It was determined the 2018/2020 Integrated Report inadvertently included E. coli on the 303(d) list for the Columbia Slough assessment units.. The correct listing is Category 4A because the TMDL includes bacteria allocations target for E. coli at 406 organisms/100 mL. Due to this, all dischargers into the Columbia Slough and its tributaries will be subject to monitoring for the E. coli benchmark, but not subject to impairment monitoring or escalating narrative water quality-based effluent limits.

DEQ has determined sector L and sector T must monitor for E. coli benchmark. The permit now requires monitoring for E. coli under the sector-specific requirements rather than under a statewide benchmark.

4.1.3 Discharges into Category 5: 303(d) listed waters for pH, total copper, total lead and total zinc

As part of the settlement agreement, DEQ committed to considering numeric water-quality effluent limits in the form of one or more proposed site-specific, TMDL-specific, or state-wide numeric water quality-based effluent limit. Permit registrants that discharge stormwater into Category 5: 303(d) listed waters for pH, total copper, total lead and total zinc must monitor for the impairment concentrations listed in Table 5 below. For discharges unable to meet the impairment concentrations for pH, total copper, total zinc and total lead, monitoring requirements escalate to a numeric water quality-based effluent limit.

See Sections 3.8 and 5.0 of this permit evaluation report for detailed rationale on establishment of impairment concentrations, associated permit conditions, and compliance schedules.

The impairment concentrations are equal to the numeric water quality-based effluent limits. DEQ performed modeling to determine the metals benchmarks that also established median hardness for lead and zinc. The median hardness values were used in the metals calculator, Endnote F of Table 30 of OAR 340-041-8033, Aquatic Life Water Quality Criteria for Toxic Pollutants. Regional translators were applied as indicated by footnote 2. The copper concentrations are the same as the benchmarks based on the 10^{th} percentile outputs from

the copper biotic ligand model work completed for this rulemaking. Impairment monitoring and numeric water quality-based effluent limits for pH are established consistent with the applicable water quality criteria defined in OAR 340-041-0021 and -0101 through -0350. These are included in the permit in Appendix A and below.

Appendix A in the permit

Basin or Water Body	OAR	Water	Criteria Range
General	340-041-0021(1)(a)	Marine	7.0 to 8.5
General	340-041-0021(1)(b)	Estuarine and fresh waters	See basin-specific criteria
Columbia River	340-041-0104(1)	Main stem Columbia River (mouth to river mile 309):	7.0 to 8.5
Snake River	340-041-0124(1)	Main stem Snake River (river miles 260 to 335)	7.0 to 9.0
Deschutes Basin	340-041-0135(1)(a)	All other basin streams (except Cascade lakes)	6.5 to 8.5
	340-041-0135(1)(b)	Cascade lakes above 3,000 feet altitude	6.0 to 8.5
Goose and Summer Lakes Basin	340-041-0145(1)(a)	Goose Lake	7.5 to 9.5
	340-041-0145(1)(b)	All other basin waters	7.0 to 9.0
Grande Ronde Basin	340-041-0156(1)	All basin streams (other than main stem Snake River)	6.5 to 9.0
Hood Basin	340-041-0165(1)(a)	Hood River Basin streams (except main stem Columbia River and Cascade lakes)	6.5 to 8.5
	340-041-0165(1)(b)	Cascade lakes above 3,000 feet altitude	6.0 to 8.5
John Day Basin	340-041-0175(1)	All basin streams (other than the main stem Colombia River)	6.5 to 9.0
Klamath Basin	340-041-0185(1)(a)	Fresh waters except Cascade lakes	6.5 to 9.0
	340-041-0185(1)(b)	Cascade lakes above 5,000 feet altitude	6.0 to 8.5
Malheur Lake Basin	340-041-0195(1)	All	7.0 to 9.0
Malheur River Basin	340-041-0207(1)	All	7.0 to 9.0
Mid Coast Basin	340-041-0225(1)(a)	Marine waters	7.0 to 8.5
	340-041-0225(1)(b)	Estuarine and fresh waters	6.5 to 8.5
North Coast Basin	340-041-0235(1)(a)	Marine waters	7.0 to 8.5
	340-041-0235(1)(b)	Estuarine and fresh waters	6.5 to 8.5
Owyhee Basin	340-041-0256(1)	All	7.0 to 9.0
Powder/Burnt Basins	340-041-0265(1)	All basin streams (other than main stem Snake River)	6.5 to 9.0
Rogue Basin	340-041-0275(1)(a)	Marine waters	7.0 to 8.5
	340-041-0275(1)(b)	Estuarine and fresh waters (except Cascade lakes)	6.5 to 8.5
	340-041-0275(1)(c)	Cascade lakes above 3,000 feet altitude	6.0 to 8.5
Sandy Basin	340-041-0290(1)(a)	All basin waters (except main stem Columbia River and Cascade lakes)	6.5 to 8.5
	340-041-0290(1)(b)	Cascade lakes above 3,000 feet altitude	6.0 to 8.5
South Coast Basin	340-041-0305(1)(a)	Estuarine and fresh waters	6.5 to 8.5
	340-041-0305(1)(b)	Marine waters	7.0 to 8.5
Umatilla Basin	340-041-0315(1)	All basin streams (other than main stem Columbia River)	6.5 to 9.0
Umpqua Basin	340-041-0326(1)(a)	Marine waters	7.0 to 8.5
	340-041-0326(1)(b)	Estuarine and fresh waters (except Cascade lakes)	6.5 to 8.5

Basin or Water Body	OAR	Water	Criteria Range
	340-041-0326(1)(c)	Cascade lakes above 3,000 feet altitude	6.0 to 8.5
Walla Walla Basin	340-041-0336	All	6.5 to 9.0
Willamette Basin	340-041-0345(1)(a)	All basin waters (except main stem Columbia River and Cascade lakes)	6.5 to 8.5
	340-041-0345(1)(b)	Cascade lakes above 3,000 feet altitude	6.0 to 8.5

Table 5. Impairment Monitoring Concentrations and Numeric Water Quality-based Effluent Limits

Georegion	Total Copper mg/L	Total Lead mg/L	Total Zinc mg/L	pH s.u.
Columbia Slough	0.017[2]	0.017[2]	0.042[2]	Basin-Specific[1]
Portland Harbor	0.015[2]	0.017[2]	0.041[2]	
Cascades	0.016	0.006	0.021	
Coastal	0.017	0.017[2]	0.043	
Columbia River Mainstem	0.023	0.046	0.082	
Eastern	0.031	0.037[2]	0.070	
Willamette Valley	0.015[2]	0.027[2]	0.057[2]	
Marine Waters	0.0058	0.22	0.095	

[1]See Appendix A for basin-specific pH concentrations
[2]Applied regional translators

Even though Table 5 and Table 5A.1 below include a list of impairments concentrations for monitoring purposes relevant to all basins and georegions, this does not indicate there are Category 5: 303(d) listed impaired waters in all basins or for every pollutant in every georegion. For example, the Columbia River Mainstem georegion includes river segments impaired for pH, E. coli and fecal coliform; however, not for metals impairments.

4.1.4 Discharges to Category 5: 303(d) listed waters for fecal indicator bacteria and total iron

Discharges unable to meet the concentration established for total iron and E. coli requires the permit registrant to implement narrative water quality-based effluent limits. Impairment monitoring will be required to continue throughout the permit cycle for E. coli and total iron unless the sample results can meet the monitoring waiver criteria for impairments. DEQ finds that narrative limits in the form of mandatory source and operational controls are most appropriate for E. coli and total iron exceedances. These pollutants are ubiquitous in our environment and often difficult to treat or trace the source of the elevated pollutants.

Table 5A.1. Impairment Monitoring Concentrations

Impairment Pollutant	Impairment Concentrations
E. coli	406 organisms/100 mL
Total iron	10 mg/L

Since permit registrants have not previously sampled industrial stormwater discharges for fecal coliform or enterococcus, monitoring requirements have been established, though associated concentrations or corrective action conditions are not included. In late 2017 EPA approved DEQ revised water quality standards for bacteria to protect people who recreate in coastal waters. It is important for DEQ to evaluate the appropriate fecal indicator bacteria based on coastal recreation and shellfish harvesting uses in coastal estuaries where fecal coliform and enterococcus impairment listing occur. The 2018/2020 Integrated Report includes listings based on the relevant indicators:

- E. coli for contact recreation in freshwater lakes, rivers, and streams
- Enterococcus for contact recreation in coastal marine and estuary waters
- Fecal coliform for shellfish harvesting in marine and estuarine waters

4.2 Pollutant Parameters

Benchmark monitoring will be identified by DEQ or agent. Statewide georegional benchmarks will be determined by using the latitude and longitude of receiving stream provided by permit registrants in a GIS layer map with the georegions overlaid. Schedule E benchmarks are required based on primary SIC code and any co-located industrial activity. If a discharge point is subject to a statewide benchmark(s) for the same parameter that also has a benchmark(s) in Schedule E, the statewide benchmark supersedes Schedule E concentrations. DEQ has established saltwater benchmarks for the first time in the 1200-Z permit. Marine discharges will be assigned saltwater benchmarks and estuarine dischargers will monitor for the more stringent benchmark between the freshwater and the saltwater.

Impairment monitoring and subsequent permit requirements will also be identified by DEQ or agent using the latitude and longitude of receiving stream provided by permit registrants and the 2018/2020 Integrated Report Interactive Web Map. With the receiving stream pinpointed an accurate assessment of Category 5: 303(d) listed waters can be easily determined. This new mapping tool is easy to use and DEQ includes instruction on our website if assistance is needed. DEQ will also make available a Geocortex map with the significant layers built-in for the purposes of this permit.

Permit registrants must monitor for pH, total copper, total lead, total zinc, total iron and the forms of bacteria, E. coli, fecal coliform and enterococcus, pollutant(s) based on discharge into Category 5: 303(d) listed waters, appropriate to receiving water characteristics, marine, estuarine, or fresh. If a permit registrant provides data demonstrating that the pollutant(s) for which the water body is impaired are not present in the discharge, the facility is exempt from impairment monitoring. If a facility is subject to impairment monitoring for the same pollutant that requires benchmark monitoring, then no benchmark monitoring will be required for that pollutant. For example, if the permit registrant discharges in an impaired water body for copper, then they will not also have a copper benchmark at that discharge point. The permit registrant will only be subject to copper impairment monitoring, exceedance response under Schedule A.13 in the permit and monitoring waiver criteria specific to impairments and not benchmarks for copper at that monitoring point. If impairment monitoring escalates to a numeric water quality-based effluent limit for pH, copper, lead, or zinc, the permit registrant must update the SWPCP and begin monitoring all discharge points determined to be substantially similar to the monitoring point that triggers the numeric limit. The permit registrant may not reduce monitoring requirements associated with substantially similar discharge points for discharges with applicable effluent limits. In the cases where a compliance schedule is requested, monitoring at all substantially similar discharge points resumes when consistent compliance with the limit is achieved.

There may be instances that DEQ or agent will identify additional impairment monitoring at the time of assignment.

4.2.1 Sampling Procedures

The requirements regarding grab sampling and composite sampling are clear that when compositing, composite samples must come from the same storm event. In addition, the permit registrant must have DEQ approval before switching between grab sampling and composite sampling during the full reporting year. Approval is not required when switching sampling methods in different reporting years. It is preferable, but not required, that all sample locations be sampled during the same storm event. pH, bacteria, and oil and grease (sector-specific monitoring) sampling procedures do not allow for composite sampling. pH must be sampled with a calibrated meter in the field and bacteria must be collected in the flow and has a very short hold time. These requirements are based on Code of Federal Regulations required methods. Registrants must follow the latest version of 40 CFR 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants* that outlines analytical methods, sampling containers, need for preservation, and among other procedural details, maximum holding times. All sampling must be performed using the proper sampling techniques in accordance with Schedule F, Section C3.

Facilities must be prepared with the proper sample bottles from the laboratory, chain of custody forms, field notebook to record pH readings, weather observations, and visual observation, gloves, coolers, and ice or dry ice, and as needed packaging materials.

The term *full reporting year* has replaced the reference to *monitoring year*; however, the definition of full reporting year in Schedule D, means the same as it did in the 2017 permit under monitoring year; representing July 1 to June 30.

The multiple discharge section of the permit lists specific occasions when discharge points are not required to be monitored. This section includes discharge points from approved mass reduction measures that reduced the mass of pollutants at or above DEQ-approved design storm capacity. For mass reduction measures installed during previous permit cycles, the permit registrant must comply with Schedule A.6, subject to proper operations and maintenance.

The discharge must be monitored during the first 12 hours of the discharge event, which is a storm event or snowmelt resulting in an actual discharge from a site. If it is not practicable to collect the sample within this period, then collect the sample as soon as practicable and provide documentation with the Discharge Monitoring Report and include why it was not practicable to take samples within the first 12-hour period. The permit registrant is not required to sample outside of regular business hours of operation or during unsafe conditions. The permit registrant must wait 14-days between storm events for sample collection to count as a qualifying sample under Schedule D, definitions. The permit registrant must monitor stormwater discharge according to the frequency described in Table 6, unless DEQ or agent grant a monitoring waiver or approve a monitoring variance.

Table 6. Monitoring Frequency

Pollutant Category	Minimum Frequency
All applicable statewide benchmarks in Table 4, any applicable sector-specific benchmarks in Schedule E and any impairment pollutants	Four times per year, two samples between January 1 and June 30, and two samples between July 1 and December 31
Any applicable numeric effluent limitations	Two times per year, One sample between January 1 and June 30, and one sample between July 1 and December 31 (unless exceed numeric effluent limit, four times per year)
Any wasteload allocations or additional schedules in EPA-approved TMDL	As specified in the TMDL

4.3 Monitoring Variance

Permit registrants must request a monitoring variance for missed samples due to non-storm events of sufficient magnitude to produce run-off during regular business hours of operation and safe conditions. Except for rare cases, this is the only criteria for approval of a monitoring variance. A variance request must be substantiated with supporting data and analysis demonstrating why there was insufficient discharge for monitoring to occur. If DEQ or agent has evidence contradicting this claim, then it is considered a permit violation for failure to monitor.

The permit includes a description of certain types of supporting documentation. This description is not intended to include all data and analysis a facility can provide. However, additional information that can be provided will make it easier for DEQ and agents to substantiate the claim. Neither DEQ nor agents are obligated to respond when approving a monitoring variance, though they strive to evaluate requests and communicate with facilities. However, if DEQ or its agent has evidence to contradict the monitoring variance, the permit registrant will be contacted.

Discharge Monitoring Reports are due quarterly. A full reporting year is defined in Schedule D as July 1 of one year to June 30 of the following year. In most cases it would not make sense to submit a variance request during the 1st and 3rd quarters. For this reason, variance requests are required semi-annually on February 15 and August

15, when applicable. If a permit registrant is unable to collect the minimum sample frequency of two samples July 1 through Dec. 31, and two samples Jan. 1 through June 30, because there was not a storm event that resulted in a measurable amount of precipitation causing an actual discharge, then a monitoring variance is required. Your DEQ Online will be the electronic portal for these requests, except for facilities in agent's jurisdictions, until notified by DEQ or agent.

Facilities that have installed mass reduction measures reducing the mass of pollutants at or above DEQ-approved design capacity may still need to request a monitoring variance if DEQ or agent requires monitoring and the discharge monitoring report claims, "no discharge."

4.4 Monitoring Waivers

When benchmark monitoring results of five consecutive samples with a geometric mean equal to or below the statewide or sector-specific benchmarks in Schedule E, a permit registrant may request a monitoring waiver. The minimum frequency of monitoring in a full reporting year (July 1 through June 30) is four samples for benchmark monitoring. Because the permit allows facilities to collect more than the minimum required frequency, a monitoring waiver request makes clear that only once a full monitoring year of data meets the condition, can a permit registrant request a monitoring waiver. In other words, a monitoring waiver request will not be accepted for samples collected in less than a full reporting year, July 1 to June 30.

The National Academies of Science was commissioned by EPA to evaluate the multi-sector general permit for industrial stormwater discharges. The consensus report made recommendations to EPA on how to improve the federal industrial permit and helped to inform the development of the 1200-Z permit. One of The National Academies of Science recommendations were that the MSGP should require a minimum of continued annual sampling, to ensure appropriate stormwater management throughout the remainder of the permit term. Extended sampling over the course of the permit would provide greater assurance of continued effective stormwater management and help identify adverse effects from modifications in facility operation and personnel over time. Given the natural variability and the limitations of grab samples, substantial uncertainty is associated with using the average of only four stormwater samples.[12]

DEQ increased the threshold from the geometric mean calculation being equal or below five samples from four, because five samples is a more appropriate sample size for this type of calculation. Pollutant concentrations in industrial stormwater have extremely high variability. Given the high amount of variability, a greater number of samples provides higher confidence that the calculated geometric mean will be representative of pollutant concentrations over the long-term. Moving from four samples to five samples provides 20 percent greater data at a relatively low cost and increases the confidence in the final determination to provide a monitoring waiver. Similarly, the use of five samples for calculating a geometric mean is consistent with data handling practices often employed for other environmental data with calculated geometric means, such as indicator bacteria. In addition to increasing the sample size requirement, DEQ added a new requirement that approved monitoring waivers are valid until July 1, 2025. The National Academy of Sciences reports, this will give DEQ a greater assurance of continued effective stormwater management over the permit term, in addition providing DEQ with two full reporting years of data for all permitted facilities. All facilities must reinstate monitoring during the first full reporting year of a permit term. This condition to reinstate monitoring during the last full reporting year will assist DEQ when analyzing the stormwater data to make sound permit decisions.
For the parameters and discharge points that triggered Tier 2, a monitoring waiver may not be requested until Tier 2 corrective action has been implemented. A waiver can be requested once approved Tier 2 corrective actions are complete and the geometric mean of five consecutive sampling results during at least a full reporting year is equal to or below the benchmarks for Tier 2 parameters. No reduction in monitoring for visual observation and federal numeric effluent limit guidelines is permitted. Also, no reduction of monitoring is allowed during the first and the last full reporting year of the permit cycle.

[12] Improving the EPA Multi-Sector General Permit for Industrial Stormwater Discharges, The National Academy of Sciences, 2019; pg. 6

4.5 Inspections

This section was updated to be consistent with permit language, provide clarity around inspection requirements, and includes minor edits to terminology. The permit registrant must take all steps to temporarily minimize or prevent discharge of pollutants until permanent corrective action is complete.

Monthly inspections are required, including visual observation of discharge by facility staff. Visual observations are used as a regular check to confirm that pollution control measures are functioning properly. If there is no discharge from a facility, the inspection can be done at any time during the month. If at any time during a month there is a discharge, then the permit requires staff to conduct visual observation at all discharge points during the same month. Visual observation must occur regardless of whether or not the monthly inspection has already occurred. The inspection must observe stormwater discharge for floating solids, odor, foam, visible oil sheen, suspended solids, or discoloration. If any of these are observed, facility staff must investigate the cause and document any corrective action or maintenance taken in a Tier 1 report.

The accurate evaluation of settleable solids requires a permit registrant to determine the amount of solid observed, preferably using an Imhoff Cone, over a given period of time. Due to the added complexity and settling time needed to properly consider settleable solids at the facility, the permit no longer requires visual observations for settleable solids. Visual observations of a stormwater sample must still be assessed for floating and suspended solids.

Visual observations are required at all discharge points monthly when discharging. The permit registrant must take a sample in a clean, colorless glass or plastic container in well-lit area during regular business hours of operation and safe conditions. Sample collection is not required to conform to 40 CFR 136 sampling procedures. For exceptionally large facilities where monthly inspections of all areas or visual observation at all substantially similar discharge points are infeasible, DEQ or agent may approve a modified inspection frequency.

4.6 Reporting and Recordkeeping Requirements

4.6.1 Reporting Monitoring Data

Permit registrants must include supporting data with the Discharge Monitoring Reports (DMR). This includes laboratory quality assurance/quality control pH field notes and chain-of-custody forms. Proper documentation is paramount for regulatory assurance and to substantiate proper handling of samples by field and lab staff.

Although only qualifying samples may be used to evaluate geometric mean and monitoring waivers, all sampling results must be reported. DEQ prefers that those results be identified as non-qualifying. The permit registrants must submit DMRs quarterly. Even if a quarterly DMR has no monitoring data to submit, a DMR must be received by the due dates in Table 7 below.

Table 7. DMR Submission Deadlines

Reporting Quarters	Months	DMR Due Dates
1st	July-September	November 15
2nd	October-December	February 15[1]
3rd	January-March	May 15
4th	April-June	August 15[1]

[1]Variance request must be submitted semi-annually, as applicable

Authorized NPDES programs must conform to electronically portal requirement as an authorized NPDES program of EPA to ensure that there is consistent and complete reporting nationwide, and to expedite the collection and processing of the data, thereby making it more accurate and timely.[13] While the rule changes, the method by which information is provided (i.e., electronic rather than paper-based) does not increase the amount of

[13] EPA's Final NPDES Electronic Reporting Rule fact sheet, September 2015, page 1

information required from NPDES regulated entities under existing regulations.[14] EPA anticipates that the final rule will save significant resources, while resulting in a more complete, accurate, and nationally-consistent set of data about the NPDES program.

Implementation of DEQ's new electronic environmental data management system, Your DEQ Online, will increase efficiency and timeliness for both DEQ and the facilities with 1200-Z permit coverage over time. DEQ's Electronic Data Management System will also reduce the costs currently associated with paper processing, mailing of hard copy discharge monitoring reports, associated quarterly laboratory reports, Tier 2 reports, and SWPCPs for facilities and DEQ. DEQ is scheduling Your DEQ Online for industrial stormwater permit registrants beginning in spring-summer 2021.

Although permit registrants within agents' jurisdictions will not follow the same electronic reporting schedule as DEQ, all permit holders will change to electronic reporting and recordkeeping instead of mailed hard copies and paper documents by the end of the permit cycle. This change will reduce costs for permit holders who no longer print, mail, and manage paper files onsite. Moreover, DEQ expects a number of efficiencies with implementing Your DEQ Online, including time-savings associated with processing, reviewing, and responding to discharge monitoring reports, corrective action reports, and monitoring waiver requests.

The public will have more information directly available to them with the implementation of Your DEQ Online, including the location of facilities with permit coverage, the stormwater discharge locations, monitoring results, and the SWPCPs implemented at all sites with permit coverage.

There is a waiver process from electronic reporting under certain circumstances. In addition to electronic reporting changes, there were minimal clarifications made. Such as all sample results from discharge points must be reported.

4.6.2 Exceedance Report for Numeric Effluent Limits

No changes were made to this section.

4.6.3 Recordkeeping Procedures

All records must be retained at a minimum three years and DEQ has included a summary table of reporting requirements and deadlines for quick reference. This table is not an exhaustive list of all reports. DEQ has attempted to update this permit with language and tables to assist registrants in understanding compliance expectations. At the time of inspection, DEQ or agent will perform a complete document review as part of permit compliance evaluation. The list now separates the requirements and incorporates EPA's MSGP language to read:

- A copy of the SWPCP and any revisions, including revised stamped SWPCP from Tier 2 corrective action;
- A copy of this permit;
- DEQ's notice of permit coverage under the current permit term;
- Documentation of maintenance and repairs of control measures, treatment systems and mass reduction measures;
- Mass reduction measures re-certification as required by Schedule A.6;
- Tier 1 reports, including industrial-specific checklist(s);
- All inspection reports;
- Documentation of any benchmark exceedance and corrective action taken;
- All copies of any reports or corrective action submitted to DEQ or agent;
- Spills or leaks of significant materials (See Schedule D.3, Definitions) that impacted or had the potential to impact stormwater or surface waters. Include the corrective actions to clean up the spill or leak as well as measures to prevent future problems of the same nature;

[14] EPA's Final NPDES Electronic Reporting Rule fact sheet, September 2015, page 1

- Documentation to support a claim that a facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections;
- Discharge Monitoring Reports, laboratory reports, pH calibration and field sampling notes;
- Compliance schedule reports as specified in Schedule C;
- Numeric limits exceedance reports;
- Water Quality Standards Report; and
- Employee education materials and records of training.

Below in Table 8 is a summary of reporting requirements and submittal date.

Table 8. Reporting

Permit Condition	Permit Schedule	Report Required	Due Date
Must not cause or contribute to a violation of instream water quality standard	Schedule A.3	Water Quality Standards Corrective Action Report	No later than 30 calendar days after receiving monitoring results
Certification of mass reduction measures installed during previous permit cycles	Schedule A.6	Stamped certification	December 31, 2021
SWPCP submission	Schedule A.9	SWPCP revision	No later than 30 calendar days after the completion of modification or as requested by DEQ or agent
Sample results exceed applicable statewide or sector-specific benchmarks or visual observations show signs of pollution	Schedule A.11	Tier 1 Report	No later than 30 calendar days after receiving monitoring results; Retain on-site and submit upon request
Geometric mean exceeds statewide benchmarks in full reporting year (July1 – June 30)	Schedule A.12	Tier 2 Report	No later than December 31, six months after June 30 (date triggered)
Geometric mean exceeds statewide benchmarks in full reporting year (July1 – June 30) Confirmation of Tier 2 implementation Confirmation of Tier 2 implementation	Schedule A.12 Schedule A.12.i.iv Schedule A.12.i.iv	Tier 2 Mass Reduction Waiver Tier 2 Background Waiver Notification confirming Tier 2 proposal installation	No later than December 31, six months after June 30 (date triggered) No later than 30 calendar days of implementation No later than 30 calendar days of implementation
Sample results continue to exceed benchmark for Tier 2 parameters post-implementation	Schedule A.11.c.v	Tier 1 Report	No later than 30 calendar days after receiving monitoring results; Retain on-site and submit upon request
Trigger numeric water quality-based effluent limit	Schedule A.13.e	WQBEL notification and compliance schedule request	No later than 30 calendar days after receiving monitoring results
Submission of monitoring results after the preceding calendar quarter	Schedule B.14	Discharge Monitoring Report	No later than February 15, May 15, August 15, and November 15
Sample results exceed numeric effluent limitations	Schedule B.15	Exceedance Report	No later than 30 calendar days after receiving monitoring results and increase monitoring frequency

5.0 Schedule C- Compliance Schedule

OAR 340-041-0061(12) allows for compliance schedules for the implementation of effluent limits derived from water quality criteria that are newly applicable to the permit. The conditions of the compliance schedule must comply with provisions in 40 CFR 122.47.

The regulations at 40 CFR 122.47 require that compliance schedules require: 1) compliance as soon as possible; 2) compliance schedules only be included when necessary to allow a reasonable opportunity to attain compliance with the new or revised requirements; and 3) compliance schedules exceeding 1 year establish interim requirements not exceeding 1 year, including submission of progress reports.

The permit establishes numeric water quality-based effluent limits for total copper, total lead, and total zinc for some permit registrants under certain situations. Previous permits contained benchmark values that allowed for the geometric mean of multiple samples. The application of numeric water quality-based effluent limits for these parameters are new to the permit, more stringent than previous permit conditions, and consistent with the requirements of OAR 340-041-0061(12).

The application of the numeric water quality-based effluent limits is based on repeated failures to achieve benchmarks or very high pollutant concentrations. If it is not feasible for permit registrants to immediately comply with the applicable final effluent limits for these pollutants, a compliance schedule is included in the permit. In many cases, permit registrants will be able to immediately comply with the final numeric water quality-based effluent limits, and the compliance schedule will not be applicable. A maximum two-year compliance schedule must be requested when monitoring results demonstrate that immediate compliance is not feasible and the request must account for economic and engineering considerations that impact the necessary time to comply with the final effluent limits.

DEQ has determined that two years represents a conservative and reasonable timeframe for permit registrants discharging industrial stormwater to identify the source(s) of the pollutant, to evaluate economic and engineering alternatives to address the exceedances, to secure funding, to select the best approach, and to implement the selected approach or begin construction, and complete construction. In some cases, two years may not be enough time for many permit registrants; if a registrant is unable to comply with the two-year timeframe, the registrant may need to seek coverage under an individual permit.

40 CFR 122.47 requires that no later than 14-days following each interim date and final date of compliance, the registrant must submit a progress report regarding compliance or noncompliance with the applicable interim action. This permit requires permit registrant to submit status reports for each of the specified actions within 14-days of each due date. The compliance schedule established in the permit is consistent with the requirements of OAR 340-041-0061(12) and 40 CFR 122.47.

Interim actions corresponding to a logical method for complying with an applicable final effluent limit have been established, and do not exceed a period of one year between interim due dates. These actions provide flexibility for the wide variability of permit registrants and operations covered under this permit yet are sufficiently specific to ensure and evaluate progress towards achieving compliance with applicable final effluent limits. In addition, the permit registrant may request more time from DEQ or agent if needed to meet the interim milestones. DEQ or agent will notify the permit registrant no later than 30 calendar days from receipt if the delay is approved or denied. However, the final deadline to comply with the numeric water quality-based effluent limits is within 24 months. An extension of the final compliance date is prohibited and will result in a permit violation.

6.0 Schedule D - Special Conditions

6.1 Releases in Excess of Reportable Quantities

No changes have been made to this section.

6.2 Availability of Stormwater Pollution Control Plan and Monitoring Data

No changes have been made to this section.

6.3 Definitions

The following definitions were added or edited in the permit:

- Background Pollutants (terminology changed from natural background)
- Compliance Schedule
- Discharge Point (includes sheet flow)
- Full reporting year
- Immediately (in context of control measures)
- Industrial-specific Checklists
- Monitoring point
- Significant Materials (expanded to include TSCA)
- Storm event
- Stormwater discharge associated with industrial activity

6.4 DEQ Agents

Minor changes were made to the wording in this section.

7.0 Schedule E - Sector Specific Requirements

Permit registrants must meet the sector-specific requirements that are associated with their primary industrial activity and any co-located industrial activities that meet the description of industrial activities covered by the stormwater regulations (CFR 122.26(b)(14)(i-ix, xi)) and/or are identified in Table 1: Sources Covered on page three and four of the permit. Some permit registrants may have multiple industrial activities that are identified in Table 1 the permit and may be subject to more than one sector-specific requirement. For example, if a facility has multiple discharge points, there may be different requirements for each depending on the type of industrial activity conducted in the drainage area associated with that discharge. This section of the permit lists the industrial activities and their corresponding SIC codes, including any sector-specific benchmarks, additional narrative technology-based effluent limits, as well as, numeric effluent limits. Facilities are required to conduct monitoring for those discharge points associated with each SIC code.

Schedule E, sector-specific monitoring has added both saltwater and freshwater criteria. Additionally, Schedule E now includes all monitoring requirements even if the monitoring requirements are duplicative with the statewide benchmarks for completeness. The table denotes “statewide benchmark” when monitoring requirements include repeat parameters from statewide benchmarks Table 4. Schedule E was adopted from EPA so some of the concentrations were based on federal promulgation of water quality standard, rather than Oregon’s water quality standards. All pollutant parameter concentrations have been revised to match Oregon’s water quality standards, except aluminum aquatic life criteria that is waiting for EPA to publish a new water quality rule for Oregon in the federal register. Since EPA’s national recommended criteria is anticipated to become effective in Oregon, Schedule E used the new aluminum concentration from EPA’s 2021 permit in the1200-Z permit.

Some of the updated concentrations include cadmium, chromium, nitrates plus nitrite, aluminum, and arsenic. The permit eliminated iron and magnesium monitoring from Schedule E consistent with EPA 2021 permit and National Academies of Science report[15] due to lack of documented toxicity to aquatic life.

Schedule E includes a table of the median hardness for each georegion for reference to use in the hardness calculation in Table 30.[16] Table 9 includes the calculated concentrations used for metals benchmark monitoring based on the median hardness listed.

[15] Improving the EPA Multi-Sector General Permit for Industrial Stormwater Discharges, The National Academy of Sciences, 2019

[16] Table 30: Aquatic Life Water Quality Criteria for Toxic Pollutants, Endnote F; OAR 340-041-8033

Table 9. Benchmark concentrations for metals in Schedule E

Georegion	Median Hardness mg/L	Total Cadmium mg/L	Total Chromium III mg/L	Total Nickel mg/L	Total Selenium[1] mg/L	Total Silver mg/L
Cascades	12.9	0.00039	0.34	0.083	0.013	0.00011
Coastal	29.75	0.0010	0.67	0.17	0.013	0.00047
Columbia River Mainstem	63.8	0.0024	1.2	0.32	0.013	0.0017
Columbia Slough	29.4	0.00099	0.66	0.17	0.013	0.00046
Eastern	53.3	0.0019	1.1	0.28	0.013	0.0013
Portland Harbor	28.55	0.00095	0.65	0.16	0.013	0.00044
Willamette Valley	41.9	0.0015	0.88	0.22	0.013	0.00085

[1] DEQ Memorandum, Implementations Instruction for Selenium, Oct. 2014, https://www.oregon.gov/deq/wq/Pages/WQ-Standards-Toxics.aspx

The monitoring table was updated after PG Environmental provided DEQ technical support to evaluate the appropriateness of Schedule E benchmarks in Oregon. These changes were discussed during the rulemaking advisory committee process. Presentations are located in the rulemaking record.

Schedule E also includes saltwater criteria applicable to marine waters stormwater dischargers. Pacific Ocean dischargers will be assigned saltwater criteria in Schedule E for all parameters. Dischargers into estuarine waters, will be assigned the most stringent benchmark between freshwater and saltwater.

8.0 Schedule F - NPDES General Conditions

These conditions are standard to all industrial NPDES permits and include language regarding operation and maintenance of facilities, monitoring and record keeping, and reporting requirements. If conflicts arise between Schedule F and any other schedule of the permit, the requirements in Schedule F will not apply.

9.0 Appendix A: Industrial Stormwater Benchmark Model Development

9.1 Methodology

DEQ developed water quality based benchmarks for copper, lead, and zinc in freshwaters and copper, lead, and zinc using Coastal and Marine Estuarine Classification Standards data—by using a modeling method based on the approach used by Herrera Environmental Consultants for the Washington Department of Ecology's Industrial Stormwater General Permit.[17] Herrera's approach considers characteristics of the receiving water body including background metals concentrations, hardness, and dilution. Monte Carlo simulations were used in the model to incorporate uncertainty and environmental variability in estimating the probability of exceeding water quality standards for a range of effluent concentrations. An acceptable probability of exceeding water quality standards is selected, and the benchmark is the effluent concentration that produces an acceptable probability of exceeding water quality standards. Herrera ran the model on multiple scenarios considering different dilution factors and receiving body conditions of both Eastern and Western Washington.

[17] Herrera Environmental Consultants, 2009. Water Quality Risk Evaluation for Proposed Benchmarks/Action Levels in the Industrial Stormwater General Permit. Prepared for the Washington State Department of Ecology

This methodology reflects the adopted aquatic life criterion for copper adopted by DEQ in January 2017, which requires use of the copper biotic ligand model rather than the hardness-based calculations. Renewal of the lead and zinc benchmarks remained as hardness-based calculations for this benchmark renewal. To accommodate regional differences in water hardness, the state was separated into seven georegions with similar water chemistry characteristics derived from US EPA's level III ecoregions (Figure A.1). In addition, estuarine waters subject to saltwater criteria were evaluated separately from the freshwater Coastal georegion (Figure A.2). Data from 2010-2019 was used in this renewal process to ensure that sufficient data sets existed for each georegion.

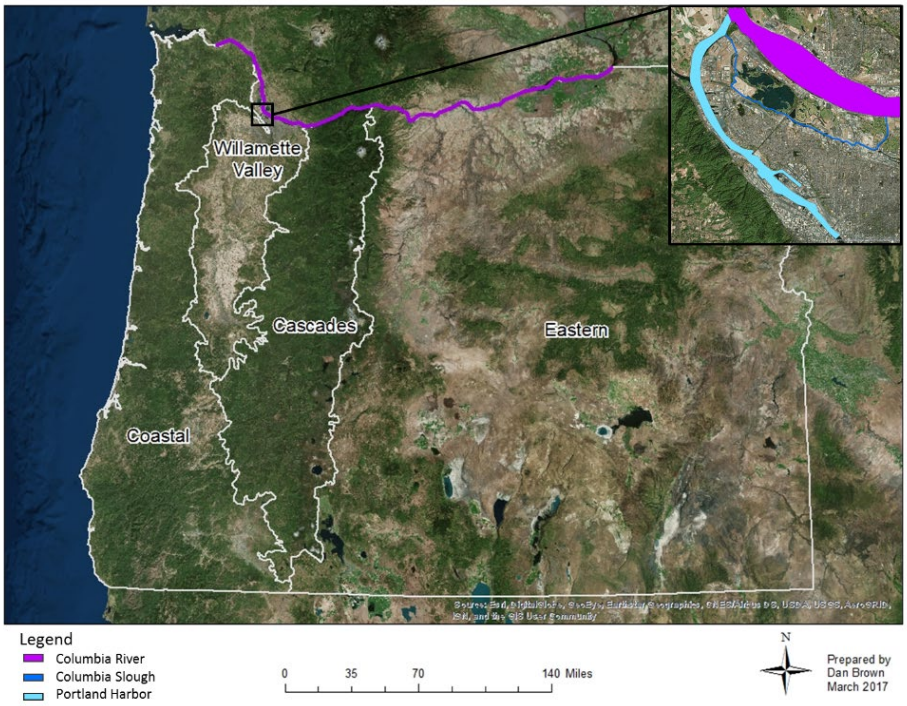

Figure A.1. Map of the seven georegions used in benchmark development

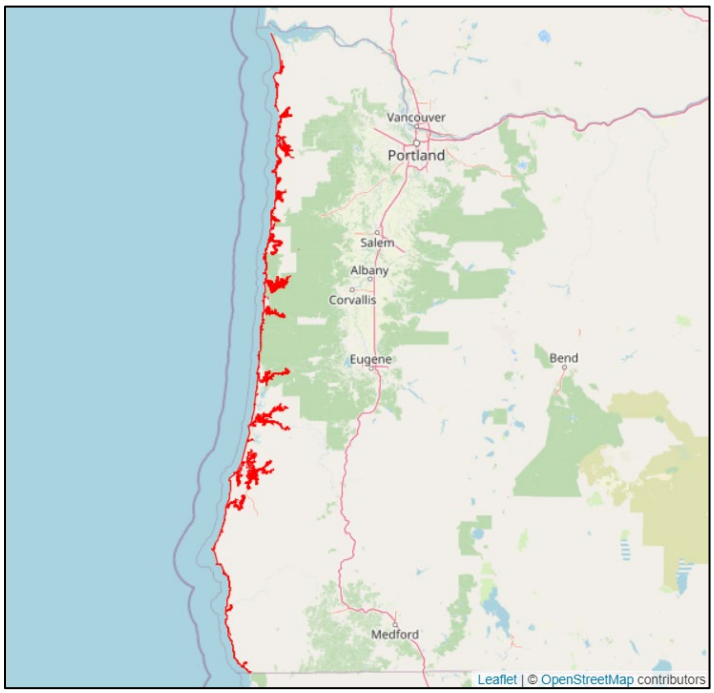

Figure A.2. Map of marine and coastal estuarine waters on Pacific coast subject to saltwater criteria. Estuarine waters marked in red.

9.2 Modeling Method

The risk-based modeling generates a large number of potential outcomes in order to estimate probabilities for the outcomes of interest. In this case, the outcome of interest is whether the receiving water concentration downstream of the discharge exceeds water quality criteria. To determine in-stream concentration downstream of a discharge, conservation of mass was used as expressed in the Herrera document by the following dilution equation:

$$C_r = \left[\left(\frac{1}{F_d}\right) \times C_f\right] + \left[\left(1 - \frac{1}{F_d}\right) \times C_b\right]$$

Where: C_r = receiving water concentration downstream of the discharge;
F_d = dilution factor;
C_b = receiving water background concentration; and
C_f = stormwater runoff concentration.

Analyses were performed using representative receiving water background concentrations (C_b) for copper, lead and zinc. A dilution factor (F_d) of five was used in all analyses. Monte Carlo simulation was used to address environmental variability of the following variables:

- Receiving water background concentrations; and
- Receiving water hardness in the seven georegions where applicable criteria are hardness-dependent. Saltwater metals criteria for the target parameters are not hardness-dependent.

The effluent concentration (Cf) was held constant throughout these iterations. At each iteration, the accompanying hardness was used to calculate a hardness-dependent water quality criterion (where applicable) for that iteration. The risk of exceeding the state water quality standard for the selected effluent concentration was then determined as the percentage of these iterations where the estimated downstream water concentration (Cr) exceeded the accompanying water quality standard. These model runs were performed across a range of potential effluent concentrations in order to generate "risk curves" that show the probability of exceeding water quality standards as a function of the effluent concentrations.

9.3 Site Selection and Data Acquisition

For this permit renewal evaluation, statewide surface water data was compiled from DEQ's Ambient Water Quality Management System (AWQMS) database, USGS's National Water Quality Information System (NWIS), and EPA's Water Quality Portal which integrates publically available data from EPA along with other state, federal, tribal and local agencies. Additional data for the Columbia Slough and Portland Harbor georegions were provided by the City of Portland.

For the freshwater benchmarks, remote mountain streams at elevations above the highest outfall (4700 ft.) were omitted. Estuarine sites impacted by tidal intrusion were evaluated separately from freshwater sites in the Coastal georegion. In addition, sites were omitted based on a proximity to an industrial facility outfall (less than 500 meters downstream). Such sites were identified by the site description or by mapping site locations against the most recent NPDES facility layer in ArcGIS. This site-selection process resulted in just over 2,000 sites with the parameters necessary for this analysis. Once the final site list was established, sites were classified into the correct georegion based on location. All data collected between 2010 and 2019 from sites in the final site list were used in the freshwater analyses; and a data range of 2013-2019 for saltwater benchmarks.

9.4 Assessment of georegions

To accommodate regional differences, the state was separated into seven georegions based on US EPA's level-III ecoregions, as illustrated in Figure A, and estuarine waters impacted by tidal intrusion were assessed separately (Figure B). Georegions comprised of adjacent ecoregions with similar water-chemistry characteristics were derived from the EPA ecoregions or major water bodies but are specifically for the copper BLM implementation. The five of the georegions are the Cascades, Coastal, Columbia River Mainstem, Eastern, and Willamette Valley.

In addition, separate benchmark modeling was performed for the Portland Harbor (that is, the lower 12 miles of the Willamette River), the Columbia Slough, and the marine and estuarine (coastal) water bodies in the Coastal georegion.

9.5 Distribution Fitting

OriginLab software was used to determine the best fit distribution based on the available data in each georegion for the following parameters: temperature, pH, dissolved copper, dissolved organic carbon, conductivity, total recoverable lead, total recoverable zinc and hardness. This software fits five different continuous distributions to the data and ranks the fit of each distribution based on the Kolmogorov-Smirnov goodness-of-fit test. This analysis was limited to the use of only uniform, continuous distributions due to the number of inverse distribution formulas included in MS Excel (i.e., normal, lognormal, and gamma). As a conservative measure, detections below the minimum reporting limit were replaced with the minimum reporting limit value. Regional default values were also used in the copper benchmark analysis based on guidance from DEQ Water Quality Standards Program (PDF). If default or minimum reporting limit values made up more than 10% of a dataset, then ProUCL software was used to determine the best fit distribution. This software is designed to be used on datasets with censored data, i.e., non-detect or values below the minimum reporting limit. The best fit distribution was selected using the regression on order statistics method. The highest ranked uniform, continuous distribution was selected for each parameter in this analysis (Tables A.1 – A.4).

Table A.1. Best fit distribution results for parameters in each of the georegions

Georegion	Temp.	pH	Copper	DOC
Cascades	Lognormal	Normal	Lognormal	Lognormal
Coastal	Lognormal	Lognormal	Lognormal	Lognormal
Columbia River	Normal	Normal	Lognormal	Gamma
Columbia Slough	Lognormal	Lognormal	Lognormal	Lognormal
Eastern	Normal	Lognormal	Lognormal	Lognormal
Portland Harbor	Lognormal	Lognormal	Lognormal	Lognormal
Willamette Valley	Normal	Normal	Lognormal	Normal
Marine/Estuarine Coastal	Not Applicable	Not Applicable	Lognormal	Not Applicable

Table A.2. Best fit distribution results for parameters in each of the georegions

Georegion	Conductivity	Lead	Zinc	Hardness
Cascades	Lognormal	Lognormal	Lognormal	Lognormal
Coastal	Lognormal	Lognormal	Lognormal	Lognormal
Columbia River	Normal	Lognormal	Lognormal	Normal
Columbia Slough	Lognormal	Lognormal	Lognormal	Lognormal
Eastern	Lognormal	Normal	Normal	Lognormal
Portland Harbor	Lognormal	Lognormal	Lognormal	Lognormal
Willamette Valley	Gamma	Lognormal	Lognormal	Gamma
Marine/Estuarine Coastal	Not Applicable	Lognormal	Lognormal	Not Applicable

Table A.3. Descriptive statistics for in-stream total lead and zinc in each of the georegions

Georegion	Dissolved Lead				Dissolved Zinc			
	Sample Size	Mean (µg/L)	Median (µg/L)	St. Dev. (µg/L)	Sample Size	Mean (µg/L)	Median (µg/L)	St. Dev. (µg/L)
Cascades	55	1.093	0.1	3.816	57	3.332	2.5	1.949
Coastal	496	0.231	0.1	6.636	475	4.164	2.5	4.106
Columbia River	37	0.087	0.068	0.11	31	1.6	1.34	1.233
Columbia Slough	484	0.29	0.052	0.52	484	1.93	0.969	2.32
Eastern	998	2.278	0.1	7.862	1020	4.457	2.5	10.21
Portland Harbor	93	0.037	0.018	0.0542	85	2.74	1.06	5.03
Willamette Valley	2494	0.108	0.0467	0.686	2672	4.691	2.5	10.33
Marine/Estuarine Coastal	144	0.098	0.0776	0.0718	144	2.064	1.047	2.979

Table A.4. Descriptive statistics for in-stream hardness and dissolved copper in each georegion

Georegion	Hardness				Dissolved Copper			
	Sample Size	Mean (µg/L)	Median (µg/L)	St. Dev. (µg/L)	Sample Size	Mean (µg/L)	Median (µg/L)	St. Dev. (µg/L)
Cascades	191	13.22	12.9	3.31	53	0.623	0.75	0.874
Coastal	490	53.84	29.75	110.11	492	0.864	0.75	0.901
Columbia River	36	63.74	63.8	8.27	36	0.605	0.564	0.239
Columbia Slough	475	49.24	29.4	28.8	330	0.829	0.73	0.462
Eastern	931	79.35	53.3	68.24	1004	1.692	1	2.208
Portland Harbor	70	41.66	28.55	19.48	86	0.665	0.529	0.464
Willamette Valley	2781	551.71	41.9	1383.17	2167	1.171	1.09	0.958
Marine/Estuarine Coastal	--	--	--	--	144	0.387	0.215	0.544

10.0 Generating Random Input Data and Histogram Verification

Once the best fit distribution was determined for a parameter, then MS Excel was used to generate random input data using the inverse of the best fit distribution for the freshwater georegions. For the marine estuarine (coastal) waters, the same process was implemented using R Statistical Computing software. The inverse distribution equations factor in the distribution's characteristic parameters such as mean, standard deviation, alpha, log-mean, log-standard deviation, and beta. This simulation was used to create a dataset of 10,000 randomly generated data points. To ensure the consistency of the randomly generated values, the process was repeated 10 times.

Histograms of the randomly generated datasets were compared to the distributions of the original data to verify that the OriginLab software identified the correct distribution as the best fit. The number of bins and bin size of the histogram was determined based on the original data. If the histogram verification indicated a poor fit, a different distribution that better represented the original data was selected (Figure A.3, Conductivity and Temperature).

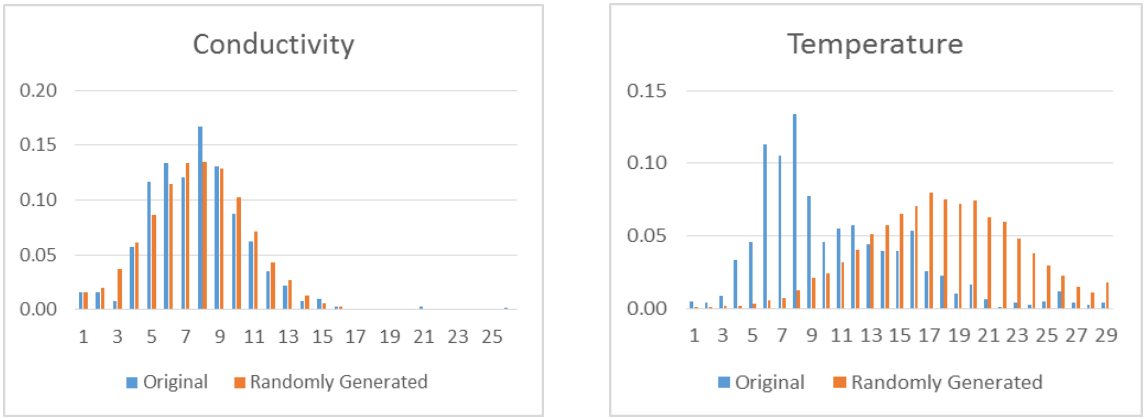

Figure A.3. Histograms indicating a good fit (left) and poor fit (right) between the original data and the randomly generated data

11.0 Modeled Results

11.1 Copper Benchmark Calculation

Where Cr is the receiving water concentration at the point of discharge, Fd is the dilution factor, Cf is the effluent concentration, and Cb is the receiving water background concentration. For the purposes of this analysis, the dilution factor was held constant at five, a representative value for the state, the effluent concentration ranged from 0-30 µg/L, and the background concentration is a value from the randomly generated copper dataset.

The Cu-BLM was used to determine the freshwater criteria against which the in-stream copper concentration is compared. The Cu-BLM program from Windward Environmental L.L.C. predicts the bioavailability of copper under a wide range of water chemistry conditions. The randomly generated datasets for temperature, pH, copper and dissolved organic carbon are required for the model to run, whereas the randomly generated dataset for conductivity is used to calculate the concentration of the geochemical ions needed for the model (Table A4). Default values for humic acid (10%) and sulfide (0.00001mg/L) were used following the EPA's recommendation. The Cu-BLM calculated a final acute value for each of the 10,000 randomly generated copper values, which was used as the criteria for the corresponding in-stream concentration.

Table A.5. Geochemical ion estimation equations

Where, "SpC" is a measurement of specific conductance in µmhos/cm, "ln" is the natural logarithm, and "exp" is a mathematical constant that is the base of the natural logarithm (~2.71828)

Parameter	Equation
Alkalinity	$Alk. = exp^{(0.88*[ln(SpC)]-0.41)}$
Calcium	$Ca = exp^{(0.96*[ln(SpC)]-2.29)}$
Chloride	$Cl = exp^{(1.15*[ln(SpC)]-3.82)}$
Magnesium	$Mg = exp^{(0.91*[ln(SpC)]-3.09)}$
Potassium	$K = exp^{(0.84*[ln(SpC)]-3.74)}$
Sodium	$Na = exp^{(0.86*[ln(SpC)]-2.22)}$
Sulfate	$SO_4 = exp^{(1.45*[ln(SpC)]-0.5.59)}$

For the marine estuarine (coastal) waters, the saltwater acute criterion is applicable (4.8 µg/L) from the Aquatic Life Water Quality Criteria for Toxic Pollutants Table 30 (PDF).

11.2 Copper Results by Georegion

Table A.6 identifies the modeled stormwater runoff concentrations that correspond to a 10% probability of exceeding water quality criteria for copper in each georegion. Dissolved benchmarks were converted to total metal concentrations using georegional translators where feasible, and default translators otherwise.

Table A.6. Modeled stormwater runoff concentrations that correspond to a 10% probability of exceeding water quality criteria for copper

Georegion	Total Copper (mg/L)
Cascades	0.016
Coastal	0.017
Columbia River	0.023
Columbia Slough	0.017
Eastern	0.031

Georegion	Total Copper (mg/L)
Portland Harbor	0.015
Willamette Valley	0.015
Marine Waters	0.025

11.3 Lead and Zinc Benchmark Calculation

DEQ developed water quality based benchmarks for lead and zinc using the same modeling method as copper. The dilution factor was also the same. Rather than using the BLM software to calculate the benchmarks, DEQ has established formulas for hardness-dependent freshwater metals criteria for lead and zinc as a part of the Aquatic Life Water Quality Criteria for Toxic Pollutants Table 30 (PDF). For the marine estuarine (coastal) waters, acute saltwater criteria from Table 30 were used. Table A.7 contains the acute criteria equations for lead and zinc, and the saltwater acute benchmarks for lead and zinc.

The in-stream concentrations and acute criteria were calculated in the same manner and the calculations were performed for each of the 10,000 randomly generated lead and zinc values. The in-stream concentrations were initially calculated at effluent concentrations from 0-30 µg/L, at 2 µg/L increments, and adjusted to higher effluent concentrations, if necessary. As with the copper analysis, this created a probability distribution of receiving water lead and zinc concentrations.

Table A.7. Hardness-dependent acute aquatic life water quality criteria

Equations for lead and zinc where, "ln" is the natural logarithm and "exp" is a mathematical constant that is the base of the natural logarithm (~2.71828).

Parameter	Freshwater Equation	Saltwater Criterion (mg/L)
Lead	$Pb = exp^{(1.273*[ln(Hardness)]+(-1.460))}$	0.21
Zinc	$Zn = exp^{(0.8473*[ln(Hardness)]+0.884)}$	0.090

11.4 Lead and Zinc Results by Georegion

Table A.8 displays the modeled stormwater runoff concentrations that correspond to a 10% probability of exceeding water quality criteria for lead and zinc in each georegion. Dissolved benchmarks were converted to total metal concentrations using georegional translators where one was available, and default translators otherwise.

Table A.8. Modeled stormwater runoff concentrations that correspond to a 10% probability of exceeding water quality criteria for lead and zinc

Georegion	Total Lead (mg/L)	Total Zinc (mg/L)
Cascades	0.018	0.068
Coastal	0.039	0.086
Columbia River	0.21	0.35
Columbia Slough	0.10	0.24
Eastern	0.077	0.16
Portland Harbor	0.24	0.24
Willamette Valley	0.11	0.14
Marine Waters	1.10	0.46

11.5 Modeled Risk-based Benchmark Curves

Figures A.4-A.6 show the modeled risk-based benchmark curves for copper, lead and zinc for each of the different georegions used in this analysis.

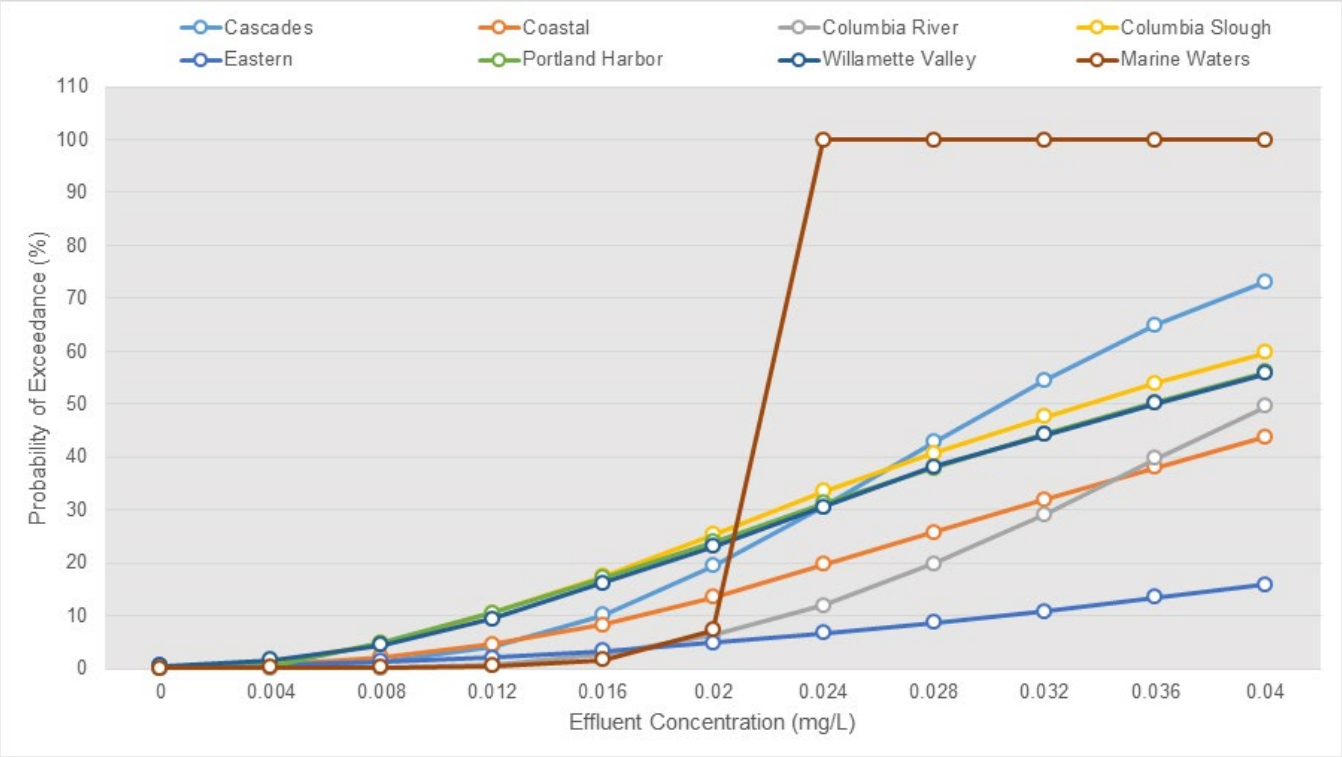

Figure A. 4. Modeled risk-based benchmark curve for dissolved copper by georegion

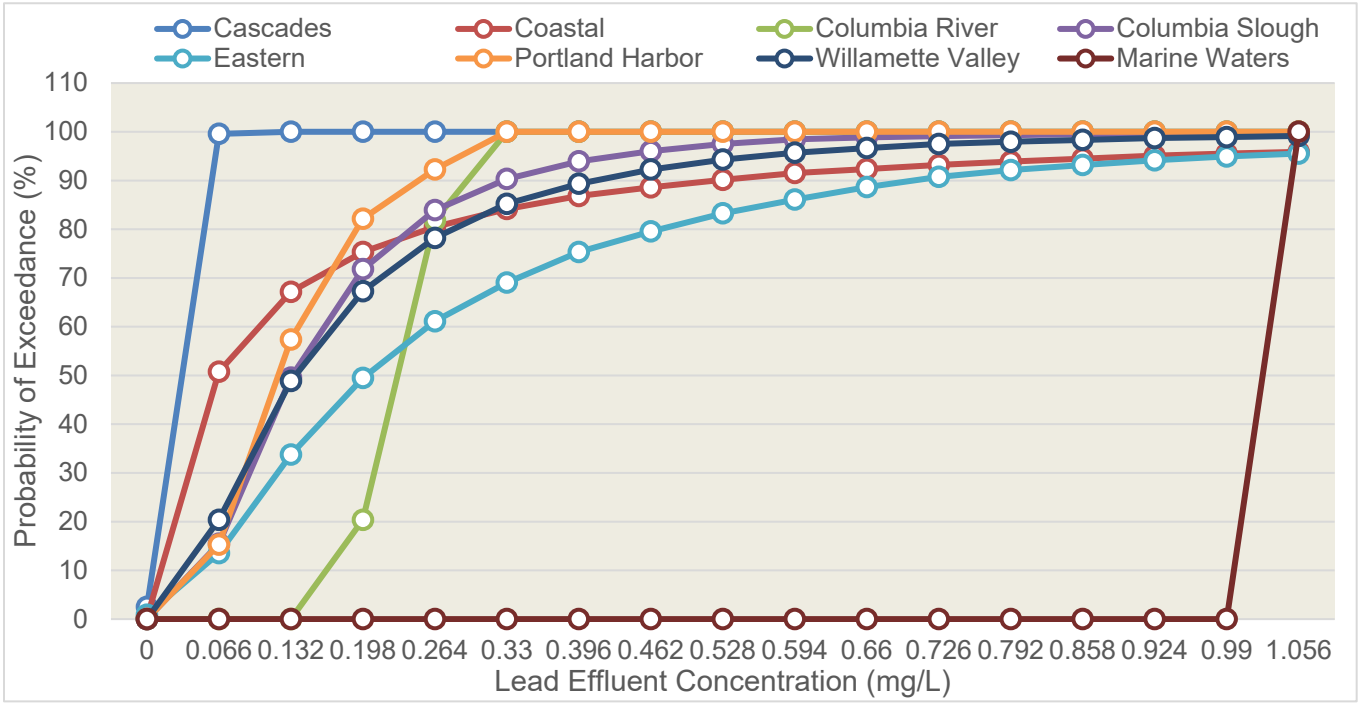

Figure A.5. Modeled risk-based benchmark curve for dissolved lead by georegion

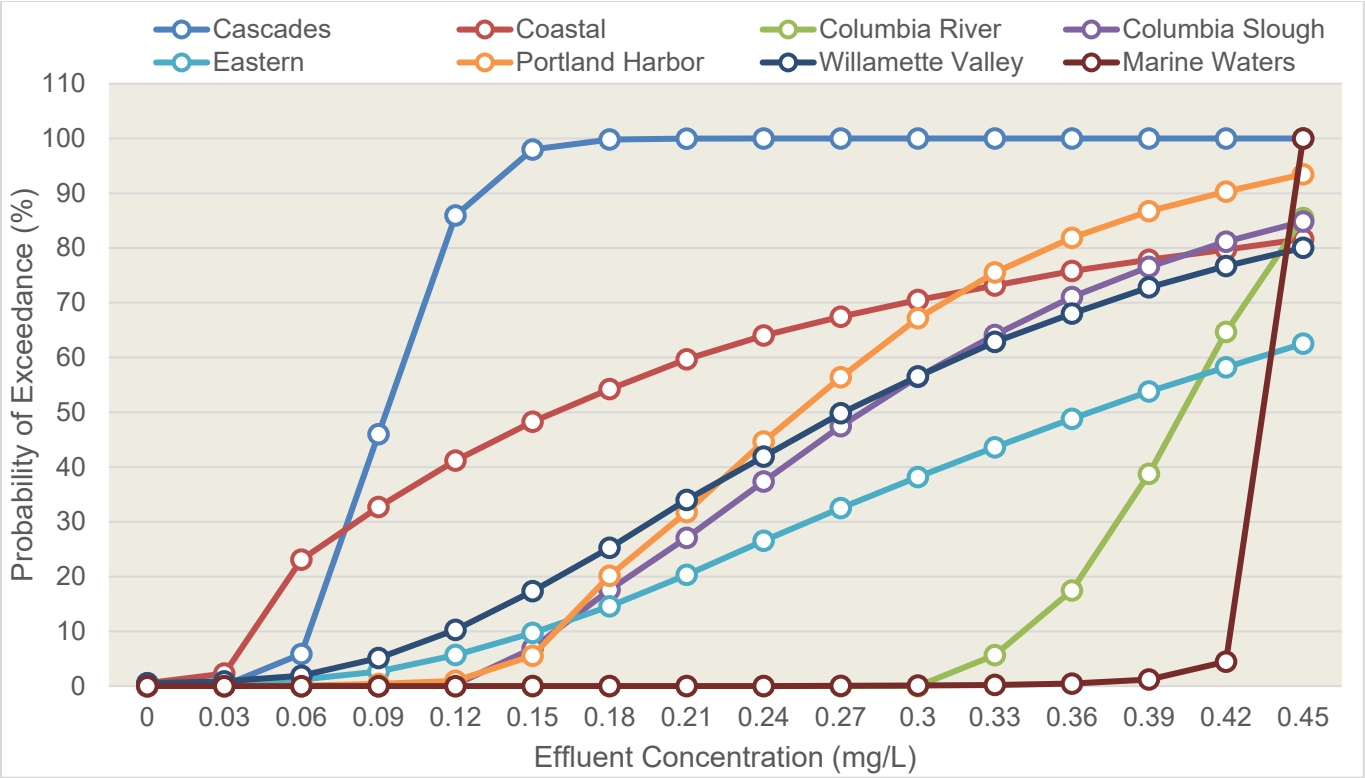

Figure A.6. Modeled risk-based benchmark curve for dissolved zinc by georegion

12.0 Final Benchmarks

Table A.9. Final Modeled Benchmarks converted to Total using either Footnote F TABLE 30: Aquatic Life Water Quality Criteria for Toxic Pollutants, or georegional translators, as applicable

Georegion	Total Copper (mg/L)	Total Lead (mg/L)	Total Zinc (mg/L)
Cascades	0.016	0.018	0.068
Coastal	0.017	0.039	0.086
Columbia River	0.023	0.21	0.35
Columbia Slough	0.017	0.10	0.24
Eastern	0.031	0.077	0.16
Portland Harbor	0.015	0.24	0.24
Willamette Valley	0.015	0.11	0.14
Marine Waters	0.025	1.10	0.46

13.0 Appendix B: Assessment of Dilution Rate

DEQ evaluated this work during the 2012 renewal. During this rulemaking PG Environmental presented during the advisory committee process an analysis on Oregon's benchmark methodology. This included literature review and comparison of other states and EPA. PG Environmental findings were to maintain risk-based assessment while discontinuing the use of technical achievability analysis. This is the benchmark methodology used in the metal modeling described in Appendix A. Further explanation of dilution used in development of the risk-based metals benchmark is described below.

Dilution is defined as the total streamflow divided by effluent flow (for this modeling, effluent flow is facility stormwater runoff). A higher dilution factor means that there is relatively less effluent in the receiving water, compared to a lower dilution factor. Thus, a higher dilution rate is more protective of the environment than a lower dilution rate.

DEQ's prior benchmarks in the 1200-Z permit are based on a dilution rate of 5, which accounts for higher receiving stream flows during storm events than during dry weather. To select an appropriate dilution rate for model input, DEQ assessed the adequacy of the current dilution rate. DEQ estimated potential dilution based on commonly occurring storm events in different regions of the state, the stormwater runoff from 48 randomly selected facilities, and the flow in streams to which they discharge. Facilities were selected using a stratified random sampling method. This method is appropriate when a known factor may contribute to differences between the items being sampled. In this case, stream size was the factor of concern. Therefore, the facilities were selected based on the size of the stream to which they discharged (see Table B.1 below). Because more facilities discharge to streams in larger watersheds, more facilities were selected from large watershed categories.

Table B.1. Distribution of evaluated facilities based on regional location and the watershed size corresponding to the point the discharge enters the receiving body

	Watershed Size		Number of Facilities	
Bin	larger than (mi^2)	equal to or less than (mi^2)	NWR & WR region	ER region
A	0.01	0.1	1	
B	0.1	1	5	
C	1	10	10	1
D	10	100	9	
E	100	1000	10	2
F	1000	10000	8	1
G	10000	--	1	

The assessment utilized the rational method, a simple rainfall-runoff equation, to estimate facilities' stormwater runoff based on rainfall depth. The rational method accounts for surface conditions, such as impervious areas, through a runoff coefficient. To calculate the dilution for each facility, estimated facility runoff was compared to the estimated receiving water streamflow. Flows were calculated as follows:
Runoff from facility

- The impervious area for each facility was used to calculate the total area that contributes runoff for each facility. Facility impervious area was obtained from the facilities' application form and SWPCP.
- Rainfall intensity was then used to calculate runoff from the facility. Rainfall data were evaluated from three regions in the state (Rogue Valley, Willamette Valley and Eastern Oregon). For each region, the median storm size was calculated, and then three storms with median flow were selected. The rainfall intensity was estimated by looking at the maximum sustained intensity for the three storms.

Stream flow

- DEQ estimated a median streamflow using the daily average flows from the rainy season for the last three years.
- DEQ estimated the flows for each facilities' stream based on the contributing area size of the watershed.

Results:

DEQ's analysis indicated that the dilution factor of 5 in the current permit is reasonable for the following reasons:

- The estimated dilution factor was 5 or more for approximately 80% of the facilities (see histogram in Figure B.1 below). Approximately 20% of the facilities had estimated dilution factors that were less than 5. These facilities all discharged to smaller watersheds (less than 5 square miles), and typically had a large impervious areas contributing to stormwater runoff (see watershed size in Figure B.2 below).
- The estimated dilution factor was more than 10 for over three-quarters of the facilities.
- The estimated dilution factor was greater than 200 for over half of the facilities.

Because this is a general permit that applies to wide variety of sources discharging too many different water bodies, and the dilution factor of 5 in the current permit is appropriate for the majority of the facilities, DEQ concluded that the dilution factor of 5 is protective of the environment and appropriate for model input.

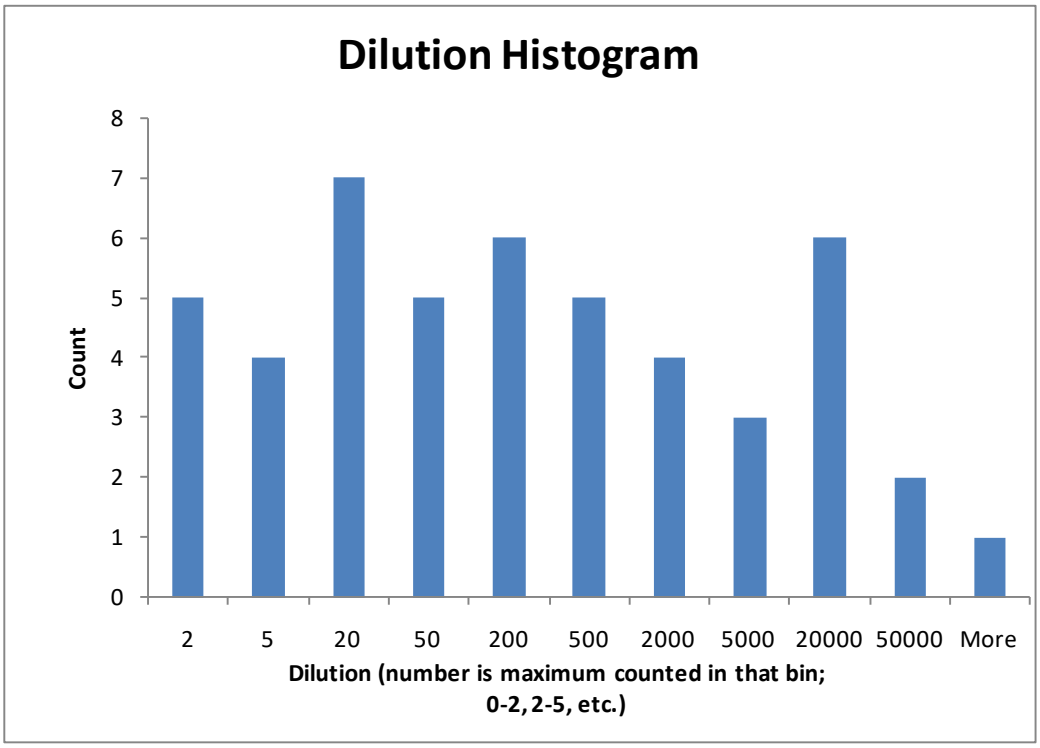

Figure B.1. Histogram of dilution factors available to 48 evaluated facilities

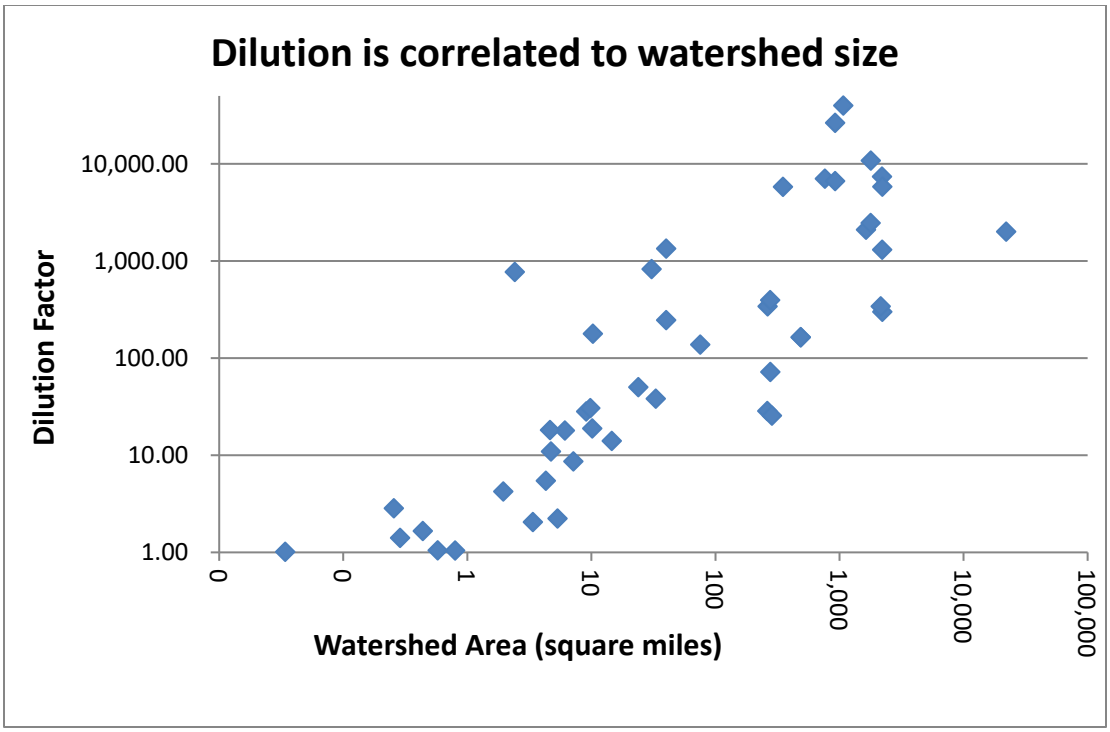

Figure B.2. Dilution factors available to 48 facilities plotted against the receiving bodies' watershed area defined by the point the discharge enters the receiving body

14.0 Appendix C: Regional Metals Translator Analyses

14.1 Introduction

A metal translator is a regulatory value for use in translating a dissolved metal concentration into a total recoverable metal concentration. 40 CFR 122.54(c) requires that National Pollutant Discharge Elimination System (NPDES) permits must specify permit conditions for metals in the total recoverable form. The U.S. Environmental Protection Agency (USEPA) has promulgated default translators which are protective of a diverse array of receiving waters, which are used in Oregon.[18] However, site- or region-specific translators may be developed tailored to specific receiving waters of interest.

DEQ reviewed and summarized existing ambient water quality monitoring data to ascertain the feasibility of estimating regional metal translators for the 1200-Z Permit. Parameters of interest were copper (Cu), lead (Pb), and zinc (Zn) for waters where freshwater criteria were applicable, and in estuarine waters where saltwater criteria were applicable.

14.2 Data Assessment

DEQ evaluated freshwater samples dated from January 2010 through December 2019, and estuarine samples dated from April 2013 through September 2019. Paired metal measurements were identified by matching sample monitoring station, sample date and time, georegion, and parameter attributes. Duplicate sample observations (i.e., sample location, sampling time, parameter, metal fraction type, qualifier, and result/MRL were identical) were identified and discarded. The remaining data pairs were used to compute the fraction of dissolved metal present in the sample pair.

The dataset was reviewed and sample pairs meeting the following criteria were discarded:

- Sample did not indicate the metal fraction type (i.e., dissolved or total recoverable metal), rendering it infeasible to compute a dissolved metal fraction.
- Sampling date was not recorded, rendering it infeasible to identify paired values.
- Sample pairs where both the dissolved metal observation and the total metal observation were non-detect, due to the infeasibility of computing a suitably accurate dissolved metal fractions using two interval estimate concentrations (i.e., concentrations known only to be present on the interval between 0 and the MRL).
- Sample pairs where the dissolved concentration was double (2x) the total metal concentration or greater. A large fraction of these discarded pairs (69 percent of the pairs discarded based on this criterion) had non-detect dissolved values where the MRL was much greater than the detected total recoverable metal concentration, which suggests the sensitivity of the analytical methods utilized for these samples pairs were incommensurate and inappropriate for use in metal fractionation computations. The remainder were discarded as likely having other unidentified data quality issues, since by definition the dissolved fraction of metal cannot exceed 1.0. The cutoff threshold was selected based on best professional judgement as a value likely to correctly identify problematic sample pairs, without discarding too many pairs where the deviation above 1.0 fraction is due to imprecision of the dissolved and total metal analytical methods when compounded together. The overall effect of discarding these values reduces the number of sample pairs where metal is present entirely in the dissolved form and, in most cases, reduces the computed metal translator.

[18] See OAR 340-041-8033, Footnote F to Table 30: https://www.oregon.gov/deq/Rulemaking%20Docs/tables303140.pdf

Table C.1. Summary of Paired Metals Data

Georegion	Parameter	No. of Metal Pairs	Dissolved Metal (ug/L)				Total Metal (ug/L)			
			Percent Non-Detect (%)	Minimum	Median	Maximum	Percent Non-Detect (%)	Minimum	Median	Maximum
Cascades	Cu	12	8	0.15	0.22	0.39	25	0.15	0.19	7.6
	Pb	15	40	0.020	0.020	0.15	7	0.020	0.030	0.10
	Zn	2	0	5.1	5.4	5.6	100	5.0	5.0	5.0
Coastal	Cu	186	9	0.15	0.66	5.7	4	0.15	0.83	7.0
	Pb	183	29	0.020	0.030	0.20	1	0.02	0.10	1.1
	Zn	72	25	2.0	5.6	33	25	1.20	5.95	39
Columbia River	Cu	32	0	0.38	0.55	0.99	0	0.478	0.79	1.3
	Pb	34	47	0.010	0.012	0.67	0	0.049	0.13	1.3
	Zn	29	83	0.50	0.53	5.4	0	0.660	1.4	5.3
Columbia Slough	Cu	109	3	0.20	0.67	2.2	0	0.28	1.3	11
	Pb	101	90	0.040	0.10	0.60	0	0.10	0.46	5.2
	Zn	107	20	0.50	1.54	13	0	0.65	5.1	56
Eastern	Cu	228	25	0.25	1.32	5.3	3	0.15	1.6	15
	Pb	223	43	0.020	0.030	0.27	2	0.020	0.20	7.3
	Zn	70	63	5.0	5.0	43	13	2.7	6.2	173
Portland Harbor	Cu	77	1	0.15	0.53	2.7	0	0.47	0.85	13
	Pb	80	14	0.0050	0.017	0.20	0	0.005	0.11	6.9
	Zn	78	42	0.40	0.60	33	0	0.40	1.5	84
Willamette Valley	Cu	1,428	9	0.15	0.90	7.4	1	0.150	1.7	16
	Pb	961	20	0.0040	0.034	1.9	0	0.016	0.25	8.7
	Zn	1,422	5	0.0025	3.1	9,460	1	0.106	6.4	9,705
Marine/ Estuarine (coastal)	Cu	7	72	0.62	1.5	3.9	29	1.3	2.1	3.7
	Pb	15	100	0.02	0.07	0.24	0	0.2	0.24	0.47
	Zn	9	0	5.04	11.6	18.8	56	5	7.2	11.7

14.3 Sample Size Characteristics

Each data set was evaluated according to its sample size characteristics, geographic characteristics (i.e., can it reasonably represent water quality throughout the georegion), and temporal characteristics (i.e., is a reasonable time span represented in the dataset, and are wet and dry seasons present). The following subsections describe the methodology used in evaluating the data sets and summarizes any deficiencies identified.

Sample size characteristics of the data sets were evaluated to determine if a sufficient quantity of high-quality data was available to support deriving metal translators. Data which was poor quality (e.g., metal pairs which were both censored, high method reporting limits [MRLs], etc.) were identified and removed from the analysis, as discussed in the section above. Data sets where a high proportion of the dissolved or total metal data were censored were noted. Data sets where an insufficient number of samples were present to characterize the target empirical distributional percentiles were also excluded.

Minimum sample sizes necessary to capture the 80th percentile of a distribution were computed using the following relationship[19]:

$p_n = (1 - \text{Confidence Level})^{1/n}$

[19] Method according to Section 3.3.2 of USEPA's Technical Support Document for Water Quality-based Toxics Control guidance (1991)

Where,

p_n = Percentile of distribution represented by largest value in the sample data set
n = The number of samples in the data set

At a 97.5% overall confidence level (which is equivalent to a 95% confidence level for the dissolved metal computation and a 95% confidence level for the total metal computation), a minimum of 17 samples are needed to capture the 80th percentile of the underlying distribution in both sample data sets.

As shown in Table 1, the copper, lead, and zinc datasets for the Cascades georegion do not meet the 97.5% confidence level sample size threshold, nor do the copper, lead, and zinc datasets for the Estuarine waters.

14.4 Geographic Characteristics

Geographic characteristics of the data set were evaluated to determine if the data sets were adequate to represent their geographic regions, and if pooling all data within a georegion was appropriate. To assess the first attribute, monitoring station locations were mapped along with state rivers[20] to assess general levels of regional coverage. To assess whether pooling data was appropriate, dissolved and total metal concentration boxplots for each monitoring station were constructed and reviewed. Boxplots were also compared along latitudinal and longitudinal gradients. Regional coverage maps are shown in Figures C.1 and C.2. Estuarine water bodies are tidally influenced water bodies along the Pacific Ocean coastline (Figure C.3). No issues were identified via the station boxplots.

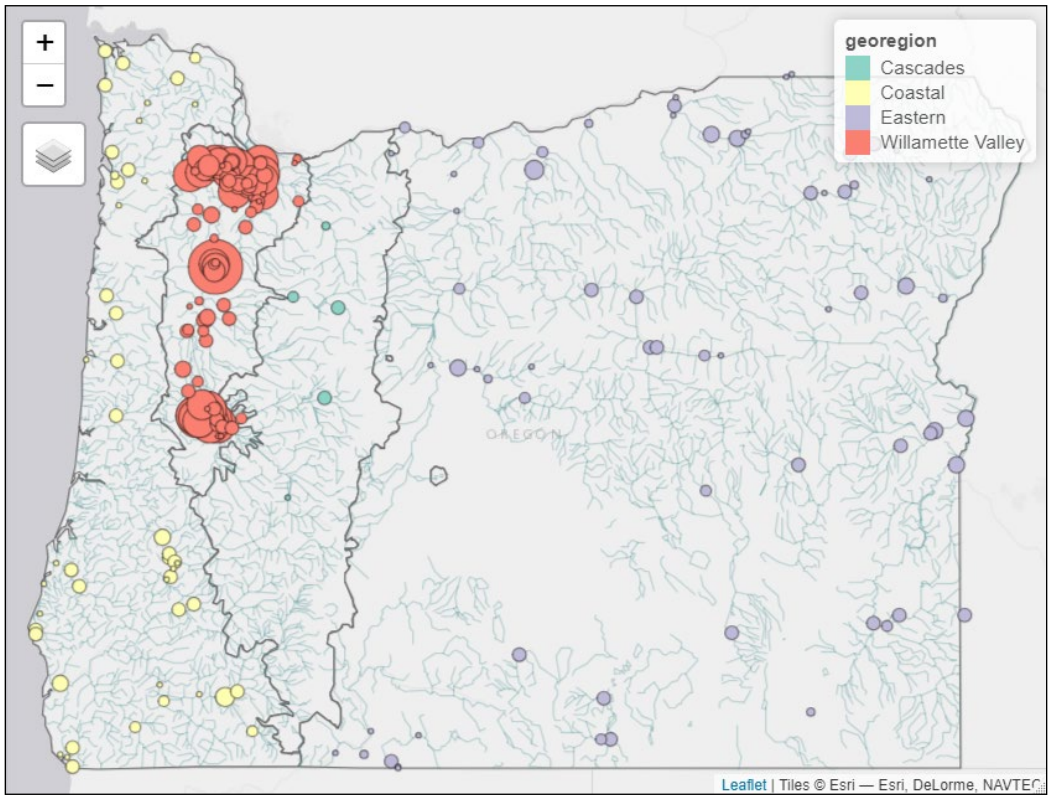

Figure C.1. Monitoring station locations for the Coastal, Willamette Valley, Cascades, and Eastern georegions. Size of dot indicates the number of samples associated with the monitoring station

[20] Source: Oregon Spatial Data Library, 2009. Obtained December 2020: https://spatialdata.oregonexplorer.info/geoportal/details;id=01606665b1034dc6877fbad58bb9879a

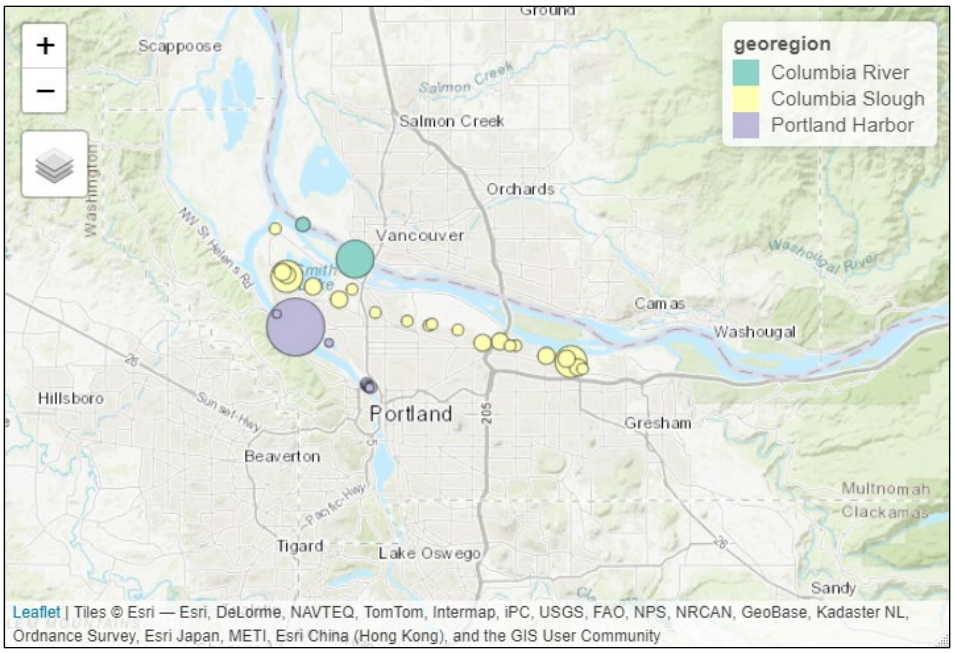

Figure C.2. Monitoring station locations for the Columbia River, Columbia Slough, and Portland Harbor georegions. Size of dot indicates the number of samples associated with the monitoring station

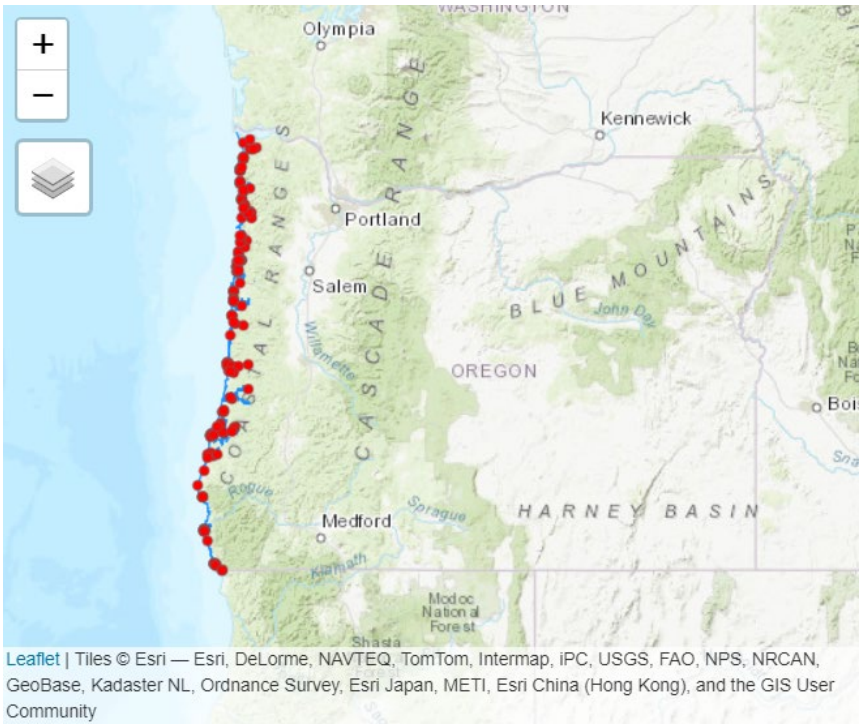

Figure C.3. Monitoring station locations for estuarine waters on the Pacific coast

The metals data sets for the Columbia River are all localized in the vicinity of the Portland metro area (Figure C.2) and do not include the vast majority of the mainstem of the Columbia River within Oregon's jurisdiction which stretches along two-thirds of the northern border of the state. The data for the Cascades georegion is relatively broader, but is missing data from drainage networks in the northern and southern portions of the georegion (Figure C.1).

14.5 Temporal Characteristics

Temporal characteristics of the data sets were reviewed to identify whether an adequate historical record was present to characterize long-term water quality behavior, and to ensure a range of seasonal conditions were represented in the data set. Figure C.4 displays the frequency and time-span of data included in the analysis for the georegions and C.5 (estuarine waters) display the day of each year on which each sample was collected and reflects the seasonal coverage of the dataset.

Each of the georegion metal data sets possessed at least three years of data and reflected the full range of seasonal conditions, with the exception of the Cascades data which was limited due to the low sample count.

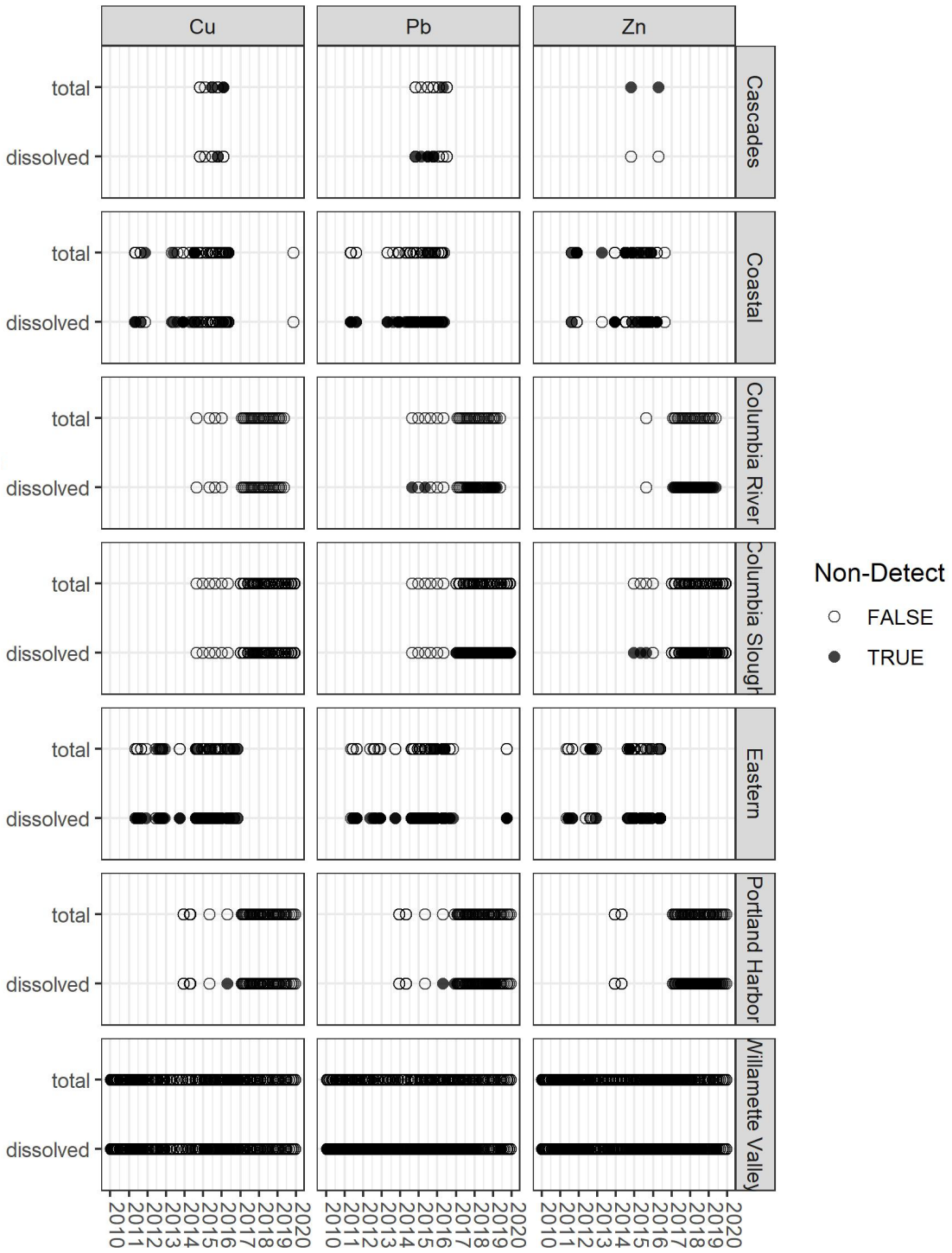

Figure C.4. Dates samples were collected. Non-detect status: false indicates a detected value, and true indicates a non-detect value

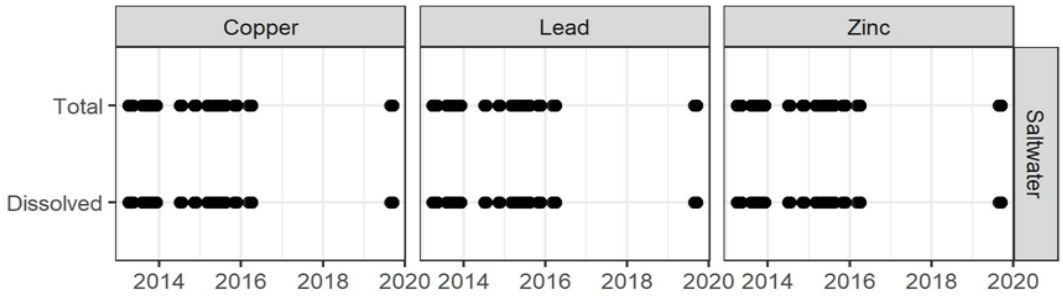

Figure C.5. Estuarine water bodies. Dates samples were collected.

14.6 Summary of Data Assessment

Based on the above assessment, it was determined that calculation of region-specific Cu, Pb, and Zn translators would be infeasible for the Columbia River and Cascades georegions. Similarly, for the estuarine waters, translators for copper, lead and zinc are infeasible due to an insufficient quantity of data. The use of the default translators is recommended for copper, lead and zinc in the Cascades, Columbia River georegions, and the estuarine water bodies. Metal translators were computed for the remaining georegions.

15.0 Metals Translators

Metal fractions were computed for all data pairs according to the following formula:

fd = Cdissolved / Ctotal

Where,

fd	= Fraction of metal in the dissolved form
Cdissolved	= Dissolved metal concentration, mg/L
Ctotal	= Total recoverable metal concentration, mg/L

Where non-detect values were present, the full value of the MRL was substituted in for the sample concentration. This substitution value will tend to overestimate fd when the dissolved metal sample is non-detect, and underestimate fd when the total recoverable sample is non-detect. Sample pairs where both values were non-detect were discarded from the analysis.

Non-detect values were more common among dissolved metal measurements than among total metal, so use of the full MRL substitution value was more conservative (i.e., protective of water quality) than use of the half-MRL substitution value. In addition, sample pairs where fd $\geq$ 2 were discarded which tended to capture sample pairs where the dissolved metal analytical methods were less sensitive than those used for the total metal (e.g., a pair with a dissolved metal concentration at <2 mg/L and a total recoverable metal at 0.01 mg/L) and corrected for some biases introduced by differences in dissolved and total MRLs.

Figure C.8 displays the resulting empirical cumulative distributions for fd by parameter and georegion with a blue vertical line marking the 80th percentile of the distribution.

An empirical 80th percentile value of the dissolved metal fraction distribution was used to estimate the translator, instead of a median or geometric mean, to provide a margin of safety on the regional translators. The rationale for assuming a margin of safety is discussed in the following section of this memo. Table 2 presents the computed metal translators for each georegion. Where it was infeasible to estimate a translator, or if the computed translator exceeds the default metal translator, the default translator has been selected in lieu of a region-specific translator.

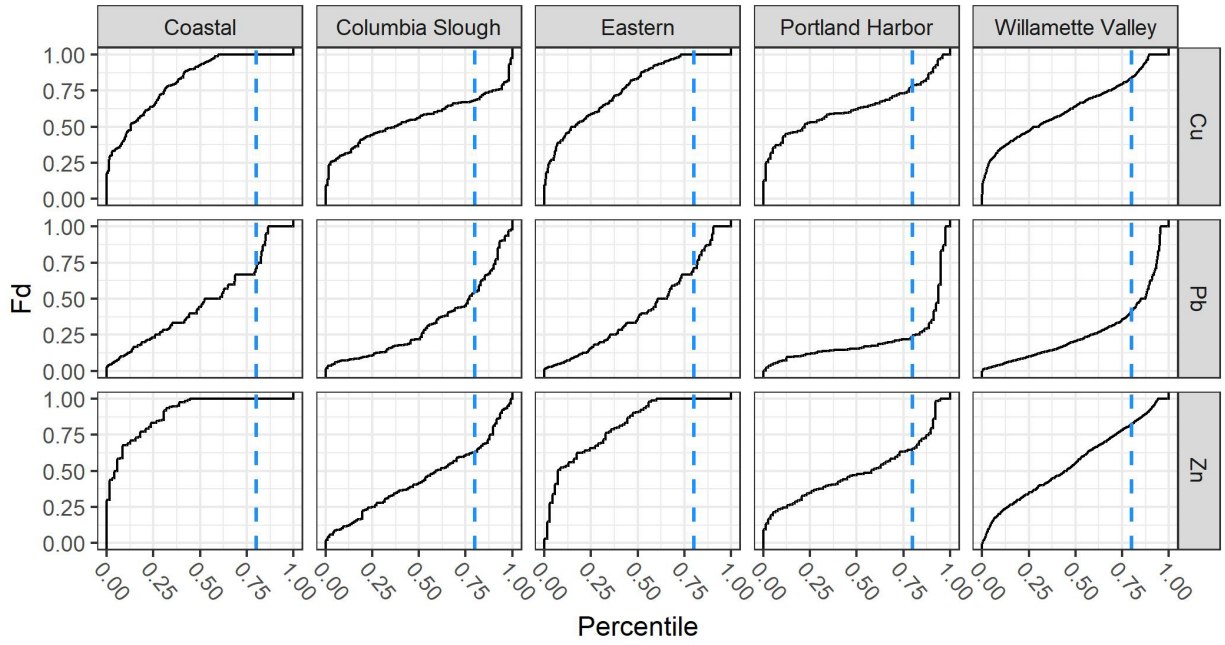

Figure C.6. Empirical cumulative distributions of dissolved metal fractions (fd) by parameter and georegion. Percentile represents the percent of values which are exceeded by a given fd value. 80th percentile marked with blue line

Table C.2. Georegional metals translators

Georegion	Copper	Lead	Zinc
Cascades	Default[1]	Default[1]	Default[1]
Coastal	Default[2]	0.70	Default[2]
Columbia River	Default[1]	Default[1]	Default[1]
Columbia Slough	0.68	0.55	0.63
Eastern	Default[2]	0.70	Default[2]
Portland Harbor	0.78	0.24	0.65
Willamette Valley	0.84	0.41	0.82
Marine Waters	Default[2]	Default[2]	Default[2]

[1] Infeasible to estimate translators for the Cascades and Columbia River georegions, and for estuarine water bodies
[2] Computed translator was less stringent than the OAR 340-041-8033 default metal translator and were not be used

15.1 Translator Percentile and Assumptions Protective of Water Quality

The use of 80th percentile threshold (Figure C.6) is a conservative assumption designed to ensure the maintenance of water quality standards in a diverse array of receiving waters throughout each georegion. The Coastal, Willamette Valley, and Eastern georegions are large and the within-region sampling intensity can be uneven. The Willamette Valley, in particular, displays some regional variation in dissolved metal fraction behavior with the less-well sampled central portion of the region showing higher dissolved metal fractions than the northern and southern portions (Figure C.7). No other region displayed a strong geographic pattern in dissolved metal fractionation at the 80th percentile dissolved metal fraction threshold.

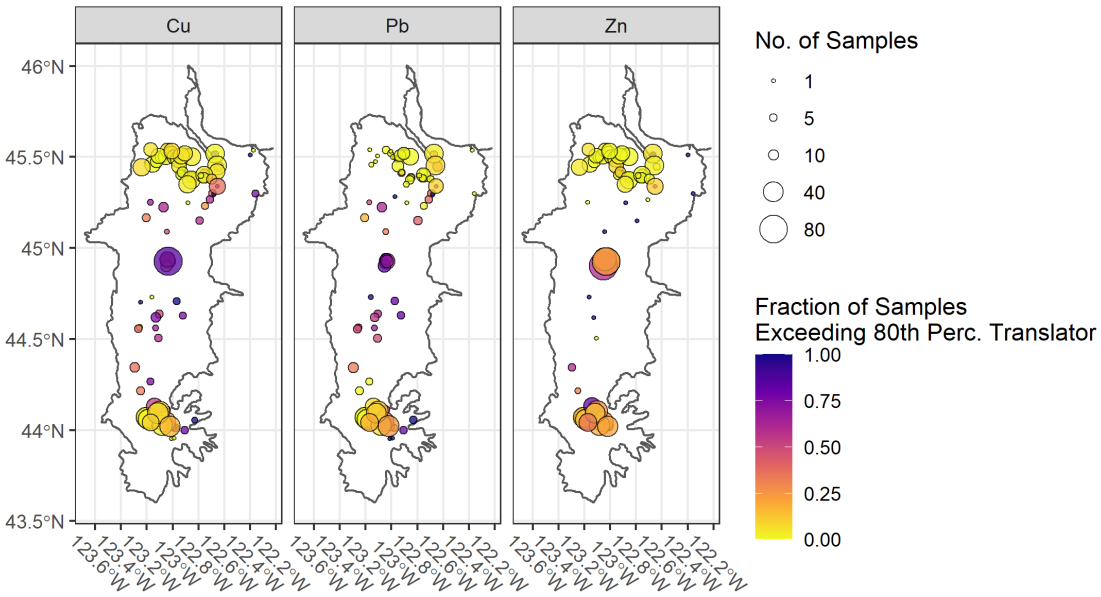

Figure C.7. Willamette Valley monitoring locations. Size of bubble indicates number of metal sample pairs included in translator computation. Color indicates the fraction of sample pairs where the dissolved metal fraction exceeds the computed regional translator.

The Columbia Slough lead metal translator was computed from a dataset which included a large proportion of non-detects (90% non-detect for dissolved metal, 0% non-detect total metal; refer to Table C.1). In this case, it was determined the data set could be used despite the limited availability of uncensored data. Use of the full MRL as the non-detect substitution value provides a conservative upper bound on the dissolved fraction since the MRL represents the maximum possible concentration which might be accurately quantified using an analytical method. The true concentration is somewhere on the interval of zero to the MRL. Therefore, the estimated Columbia Slough metal distribution represents a conservative estimate of metal fractionation despite the high prevalence of non-detect dissolved values.