



State of Oregon Department of Environmental Quality
1200-Z Permit Rulemaking
Background Paper: Water Quality-Based
Numeric Effluent Limits

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This background paper supports information for this rulemaking to renew Oregon’s industrial stormwater permit, officially called the National Pollutant Discharge Elimination System Stormwater Discharge General Permit No. 1200-Z.

Federal Definitions

The definitions below are used throughout this document and in presentations by DEQ.

Term	Definition
Water Quality-Based Effluent Limitation (WQBEL)	An effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water.
Water Quality Criteria	Elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.
Wasteload Allocation (WLA)	The portion of a receiving water’s loading capacity that is allocated to one of its existing or future point sources of pollution.
Water Quality Limited Segment	Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by Clean Water Act sections 301(b) and 306.

Background

Numeric water quality-based effluent limits (WQBELs) typically involve a site-specific evaluation of a discharge and its effect on the receiving water for individual permits. A WQBEL is designed to protect the quality of the receiving water by ensuring that state water quality standards are met.

Section 303(d) of the Clean Water Act establishes a process for states to identify waters where implementing technology-based controls is inadequate to achieve water quality standards. States establish a priority ranking of these waters and develop total maximum daily loads (TMDLs). A TMDL determines the amount of a specific pollutant from point, nonpoint, and natural background sources, including a margin of safety that may be discharged to a waterbody while continuing to ensure that the waterbody achieves water quality standards. Effluent limits in National Pollution Discharge Elimination System (NPDES) permits must be consistent with the assumptions used to derive wasteload allocations.

In the absence of a TMDL, permitting authorities must assess the need for effluent limits based on water quality standards and where necessary, develop effluent limits. If technology-based effluent limits are not sufficient to meet the water quality standards in the receiving water, the Clean Water Act and NPDES regulations require that permit has the appropriate WQBELs.

Water quality-based effluent limits may be expressed in a permit as numeric, narrative, or a combination of both. When numeric effluent limits are infeasible, the Clean Water Act authorizes best management practices for permit conditions for controlling stormwater discharges. The U.S. Environmental Protection Agency issued a policy for states to adopt an interim permitting approach for regulating stormwater discharges. The policy states, “Due to the nature of stormwater discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA will use...best management practices (BMPs) in first-round stormwater permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards.”¹ To date, Oregon and most states, and the EPA, have not developed a methodology for the inclusion of WQBELs in general stormwater permits.

Washington State Ecology, Industrial Stormwater Permit Water Quality-Based Effluent Limits for Dischargers to 303(d)-listed Waters

Oregon’s 2018 settlement agreement on the permit committed DEQ to assess and consider the information reflected in Washington State Ecology’s 2015 permit. Appendix A provides Table 6 from Ecology’s permit: Sampling and Effluent Limits Applicable to Discharges to 303(d)-listed Waters. The entire permit may be found online with associated permit documents.²

After years of legal challenges to Ecology’s industrial permit, the Washington state legislature directed Ecology to use numeric water-quality effluent limits in their stormwater permits. In response, Washington state regulations set conditions for when Ecology should implement numeric effluent limits. According to the revised code, the department must require compliance with numeric effluent limits when the discharges are subject to:

- Numeric limits established in federally adopted, industry-specific effluent guidelines;
- State developed, industry-specific, performance-based numeric limits;

¹ Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, U.S.EPA National Policy, August 26, 2006

² <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Industrial-stormwater-permit>

- Numeric limits based on a completed TMDL or other pollution control measures; or
- Ecology determination that the covered discharges have a reasonable potential to cause or contribute to violation of state water quality standards and that effluent limitations based on nonnumeric best management practices are not effective in achieving compliance with state water quality standards.³

In making a determination regarding reasonable potential to cause pollution and ineffectiveness of BMPs, Ecology must use procedures that account for existing controls on point and nonpoint pollution sources, variability of the pollutant in stormwater runoff, and as applicable, the dilution of the storm water in the receiving water.³

The 2010 Ecology industrial stormwater general permit included numeric effluent limits for 303(d) impairments applied to impaired waterbodies that were “listed” due to pollutants that are typically present in industrial stormwater discharges.

The 2015 permit fact sheet explains: Ecology has determined that stormwater discharges may cause a violation of water quality standards for a variety of pollutant parameters based on professional judgement and EPA’s Nationwide Urban Runoff Program, Evaluation of Washington’s Industrial Stormwater General Permit.⁴

Ecology has used varied compliance schedules to give permit registrants time to make appropriate changes to their sites prior to numeric effluent limits becoming effective. In Washington, it is a permit violation if a facility fails to meet a numeric effluent limit, unless the facility is operating under the conditions of the compliance schedule.

Washington’s 2015 industrial stormwater general permit designates water quality-based numeric effluent limits for certain dischargers to impaired water (without a TMDL) for the following parameters:

- Turbidity
- Total Suspended Solids
- Total Mercury
- Total Phosphorus
- Total Ammonia as Nitrogen
- Total Copper
- Total Zinc
- Total Lead
- Total Mercury
- pH
- Pentachlorophenol
- Bacteria: Fecal Coliform, E. coli*, Enterococci* (reporting only, no corrective action, narrative water quality-based effluent limit)

*new requirement 2019 draft permit based on water quality standards update

³ Summarized from 2005 Washington Revised Code RCW 90.48.55: Construction and Industrial storm water general permits effluent limitations – Expired January 1, 2015

⁴ Evaluation of Washington’s Industrial Stormwater General Permit, EnviroVision and Herrera Environmental Consultants, November, 2006

Washington State TMDL Procedure for Industrial Stormwater

Language from Washington State’s 2014 fact sheet: “Where an operator indicates on its application for coverage form that the discharge is to an impaired waterbody, Ecology will review the applicable TMDL to determine whether the TMDL includes requirements that apply to the individual discharger or its industrial sector. Ecology will also determine whether more stringent requirements are necessary to comply with the wasteload allocation, whether compliance with the existing permit limits is sufficient, or alternatively, whether an individual permit is necessary. If Ecology determines that additional requirements are necessary, Ecology will incorporate the final limits as site-specific terms to the facilities general permit coverage.”⁵

Currently, there is only one facility in Washington subject to a numeric effluent limit based on TMDL requirements covered under the general permit, below.

Site Name	Parameter	Units	Average Monthly	Maximum Daily	Minimum Sampling Frequency
Rockford Elevator & Agronomy	TSS	mg/L	27	88	1/month

Oregon Permit Considerations for Discussion

- What methodology would be appropriate for calculating or deriving numeric water quality-based effluent limits for industrial stormwater?
- Should discharges of impairment pollutants to impaired waters be required to submit additional information as part of their Stormwater Pollution Control Plan, including a proposal for active or passive treatment when appropriate, as a condition of permit coverage?
- If DEQ sets water quality-based numeric limits, should DEQ continue to notify permit registrants through permit assignment letters if they are not set in the permit? This would apply to those pollutants which are dependent on waterbody specific characteristic, such as hardness, pH, or copper BLM inputs. This generally applies to metals and total ammonia as nitrogen acute criterion.

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

⁵ Washington State Ecology Industrial Stormwater General Permit – Fact Sheet, May 7, 2014

Appendix A

Table 6: Sampling and Effluent Limits Applicable to Discharges to 303(d)-listed Waters from Washington State Ecology’s Industrial Stormwater Permit

Parameter	Units	Maximum Daily ^a		Analytical Method ^b	Laboratory Quantitation Level ^c	Sampling Frequency ^d
		Freshwater	Marine			
Turbidity	NTUs	25	25	EPA 180.1 Meter	0.5	1/quarter
pH	SU	j	Between 7.0 and 8.5	Meter	±0.1	1/quarter
Fecal Coliform Bacteria	# colonies/ 100 mL	i	i	SM 9222D	20 CFU/ 100 mL	1/quarter
TSS ^f	mg/L	30	30	SM2540-D	5	1/quarter
Phosphorus, Total	mg/L	g	g	EPA 365.1	0.01	1/quarter
Total Ammonia (as N)	mg/L	g	g	SM 4500 NH ³ -GH	0.3	1/quarter
Copper, Total	µg/L	g	g	EPA 200.8	2.0	1/quarter
Lead, Total	µg/L	g	g	EPA 200.8	0.5	1/quarter
Mercury, Total	µg/L	2.1	1.8	EPA1631E	0.0005	1/quarter
Zinc, Total	µg/L	g	g	EPA 200.8	2.5	1/quarter
Pentachlorophenol	µg/L	9 ^h	g	EPA 625	1.0	1/quarter

^a Maximum daily effluent limit means the highest allowable daily discharge. The daily *discharge* means the *discharge of a pollutant* measured during a calendar day. The daily discharge is the average measurement of the *pollutant* over the day; this does not apply to pH.

^b Or other equivalent method with the same reporting level.

^c The Permittee shall ensure laboratory results comply with the *quantitation level* (QL) specified in the table. However, if an alternate method from 40 CFR Part 136 is sufficient to produce measurable results in the sample, the Permittee may use that method for analysis. If the Permittee uses an alternative method it must report the test method and QL on the DMR. If the Permittee is unable to obtain the required QL due to matrix effects, the Permittee must report the matrix-specific method detection level (MDL) and QL on the DMR.

^d 1/quarter means at least one sample taken each quarter, e.g., Q1 = Jan 1 – March 31, Q2 = April 1 – June 30.

^e Permittees shall use either a calibrated pH meter consistent with EPA 9040 or an approved state method.

^f Permittees who discharge to a waterbody 303(d)-listed (Category 5) for *sediment* quality shall sample the *discharge* for TSS.

^g Site-specific effluent limitation will be assigned at the time of permit coverage.

^h Based on a pH of 7.0.

ⁱ A numeric effluent limit does not apply, but Permittees must sample according to Table 6. In addition, the following mandatory BMPs shall be incorporated into the SWPPP and implemented; the Permittee

Table 6: Sampling and Effluent Limits Applicable to Discharges to 303(d)-listed Waters from Washington State Ecology’s Industrial Stormwater Permit

must:

- 1) Use all known, available and reasonable methods to prevent rodents, birds, and other animals from feeding/nesting/roosting at the facility. Nothing in this section shall be construed as allowing violations of any applicable federal, state or local statutes, ordinances, or regulations including the Migratory Bird Treaty Act.
- 2) Perform at least one annual dry weather inspection of the stormwater system to identify and eliminate sanitary sewer cross-connections.
- 3) Install structural source control BMPs to address on-site activities and sources that could cause bacterial contamination (e.g., dumpsters, compost piles, food waste, and animal products).
- 4) Implement operational source control BMPs to prevent bacterial contamination from any known sources of fecal coliform bacteria (e.g., animal waste).
- 5) Conduct additional bacteria-related sampling and/or BMPs, if ordered by Ecology on a case-by-case basis.

^j The effluent limit for a Permittee who discharges to a fresh waterbody 303(d)-listed for pH is: Between 6.0 and 8.5, if the 303(d)-listing is for high pH only; Between 6.5 and 9.0, if the 303(d)-listing is for low pH only; and Between 6.5 and 8.5 if the 303(d)-listing is for both low and high pH. All pH effluent limits are applied end-of- pipe.