

# Mixing Zones for Wastewater Discharges

## Issue

Mixing zones are areas around treated wastewater discharges where the state allows flexibility in meeting water quality standards. Washington's allowance is one of the most restrictive in the nation. All states have a mixing zone policy or regulation.

Mixing zone conditions are described in Washington's Water Quality Standards (Chapter 173-201A WAC). Municipal and industrial dischargers must apply all known and reasonable prevention, control and treatment methods (AKART) before the Department of Ecology (Ecology) can authorize a mixing zone. The size of the area is small enough that it doesn't interfere with beneficial uses, such as swimming, drinking and fish habitat.

Ecology allows mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology establishes mixing zones that limit the amount of time the discharge could potentially cause harm to water quality, plants or fish.

## General considerations for mixing zones in Washington State

Washington's Water Quality Standards allow Ecology to authorize mixing zones subject to the following conditions:

- Ecology must establish the allowable size and location in discharge permits or orders.
- The industry or municipality must fully apply technology-based requirements (all, known, available, and reasonable prevention, control and treatment methods) prior to Ecology's authorization of a mixing zone.
- Ecology must consider critical discharge conditions. Critical condition is the time when the physical, chemical, and biological characteristics of the receiving water environment interact with the effluent to produce the greatest potential adverse impact on the aquatic life and existing water uses.
- The authorization must not cause loss of sensitive or important habitat.
- Pollutants must not exceed criteria past the boundary of the mixing zone.
- Ecology must minimize the mixing zone size and the pollutant concentrations.
- A mixing zone cannot create a barrier to the migration or translocation of indigenous organisms -- for example salmon -- or have the potential to cause damage to the ecosystem.
- Mixing zone allowances apply to standards for the protection of aquatic life and human health.

## Mixing zones in permits

Ecology may authorize a mixing zone if it determines or expects that any pollutant will not meet a water quality criterion after application of technology-based methods of control, prevention and treatment. Ecology typically authorizes a standard sized mixing zone and protects water quality at the edges of the zone. If the water quality is not within criteria, Ecology lowers the discharge limits.

## Exceptions for mixing zone size limitation

Ecology may allow a larger mixing zone than previously described in situations where:

- Ecology approved the engineering report for the discharge before Nov. 24, 1992.
- Altering the size configuration would result in greater protection.
- The effluent provides a greater benefit due to the additional flow it provides rather than removing it, if removing it is the only option.
- Not meeting the water quality standard is clearly necessary to accommodate important social or economic development.

Before Ecology can make an exception, the company or municipality must demonstrate that:

- It has applied all known and reasonable control, prevention and treatment methods (AKART).
- It is using all other economically achievable options.
- Granting the exception would not have the reasonable potential to cause a loss of sensitive or important habitat. And, it would not substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health.
- It has applied all appropriate best management practices to manage stormwater.

## Denying or minimizing mixing zones

Ecology may eliminate or deny mixing zones based on environmental factors or technology factors.

Environmental Basis– Ecology may deny a mixing zone if:

- It demonstrates a negative effect on aquatic life or human health due to the allowance of a mixing zone.
- The receiving water already fails to meet water quality standards.

Technology Basis– Ecology may deny a mixing zone if:

- It believes that a discharger can prevent, treat, or control a pollutant at a reasonable cost such that it would no longer need a mixing zone.

**Permitted mixing zones**

Ecology is currently compiling information regarding the mixing zones authorized in NPDES (National Pollution Discharge Elimination System) permits. The information will include a listing of the permitted facilities, the size of the mixing zones, the acute and chronic dilution factors, and the pollutants or class of pollutants that may violate standards within the mixing zone.

**More information**

[www.ecy.wa.gov/programs/wq/permits/index.html](http://www.ecy.wa.gov/programs/wq/permits/index.html)

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