



Memorandum

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To: DEQ Water Quality Permit Writers and 401 Staff

Regarding: Procedures to determine if a new or increased load would be a *de minimis* lowering of water quality

Date: May 2, 2018

This memorandum describes a procedure for determining whether a proposed discharge will have more than a *de minimis* lowering of water quality and will trigger High Quality Water antidegradation requirements at OAR 340-041-0004(6) and (9)(a), which require the EQC or DEQ to make certain findings in order to allow a lowering of water quality in waters where the quality is better than applicable criteria and there is assimilative capacity available to allocate. This memo is a narrow modification to DEQ's Internal Management Directive on Antidegradation Policy Implementation, and addresses EPA comments on how DEQ implements its antidegradation policy for high quality waters (i.e., waters with a quality better than applicable criteria). This memorandum applies if both of the following statements are true:

- An entity is applying for an individual NPDES permit with a new or increased load of one or more pollutants, other than temperature, dissolved oxygen or turbidity; and
- The receiving water quality is currently better than applicable water quality criteria for the pollutants for which there is a proposed new or increased load.

Background

Federal and state antidegradation policy requires certain determinations to permit a new or increased pollutant load to high quality waters¹. However, EPA allows States to compare the impact of the discharge on water quality against a *de minimis* threshold so that States can “allocate limited staff resources to high priority reviews that are likely to yield the greatest environmental benefits.”²

Many states use *de minimis* thresholds in order to focus efforts on high priority antidegradation reviews. The threshold is measured in terms of the percentage of assimilative capacity the discharge would use, either on its own or cumulatively when accounting for other new or increased loads. The cumulative threshold exists so that receiving streams avoid a scenario in which multiple dischargers can lower water quality by *de minimis* amounts, but cumulatively result in more than a *de minimis* lowering of

¹ Oregon's antidegradation policy requires that DEQ or the Environmental Quality Commission make a finding for new or increased pollutant loads that the load does not result in a violation of water quality standards, will not threaten or impair threatened and endangered species, and that the action is necessary and the benefits of lowered water quality outweigh the environmental costs.

² U.S. EPA, Advance Notice of Proposed Rulemaking for the Water Quality Standards Regulation, 63 Fed. Reg. 36742, 36783 (July 7, 1998)

water quality without undergoing a full antidegradation review that is consistent with 40 CFR 131.12(a)(2).

In 2013, EPA reviewed DEQ's Antidegradation Policy Implementation IMD. EPA found that DEQ's antidegradation procedures for high quality waters were inconsistent with having an acceptable *de minimis* threshold, because:

- 1) The use of "measurable" in determining whether or not there was a lowering of water quality considered potentially real but unmeasurable degradation as no degradation; and
- 2) The procedures did not set a cumulative limit on lowering of water quality without a full antidegradation review. EPA suggested that DEQ could include an appropriate *de minimis* procedure in its antidegradation implementation methods.

This procedure document clarifies how DEQ will determine if an activity will trigger a full antidegradation review, as described in the section titled, "Requirements for High Quality Waters" within the antidegradation IMD. This procedure does not cover antidegradation procedures for temperature and dissolved oxygen, as antidegradation rules at 340-041-0004(3)(c) and (d) already include *de minimis* provisions for those parameters, as well as turbidity, the standard for which is effectively a *de minimis* criterion.

Definition of "de minimis"

DEQ establishes the following as its working definition of a *de minimis* lowering of water quality for purposes of the state's antidegradation policy:

1. The discharge and the accompanying lowering of water quality is short-term and temporary; or
2. The discharge uses less than 2.5% of the assimilative capacity (water quality criterion minus baseline water quality*) within an assessment unit; or
3. The discharge does not result in a cumulative use of more than 10% of the assimilative capacity of that pollutant when accounting for other new, increased, and decreased loads in the same assessment unit authorized since the date of this memorandum.

*Baseline water quality is the concentration of the pollutant at the time the first request for a new or increased load of that pollutant after the date of this memo.

If these conditions are not met, DEQ staff must follow the procedures for a lowering of water quality in high quality waters in the antidegradation IMD.

DEQ will not apply the *de minimis* exception to the following bioaccumulative pollutants. Any proposed new or increased load of these pollutants must undergo a full antidegradation review.

- Dioxin
- Chlordane
- DDT, DDE, DDD
- Dieldrin

- Endrin
- Heptachlor, Heptachlor epoxide
- Hexachlorobenzene
- Mirex
- PCBs
- Pentachlorobenzene
- Chlorinated naphthalenes

Short-term and temporary impacts

DEQ may allow short-term and temporary lowering of water quality that still meets water quality standards and protects designated beneficial and existing uses, without requiring an antidegradation review. Any short-term and temporary allowances are still subject to the terms and conditions in the applicable permit or certification. If DEQ staff determine that the lowering of water quality is short-term and temporary, the permit writer should include the following language in the permit:

“DEQ has determined that this discharge will result in a short-term and temporary lowering of water quality for {pollutants}, but will still result in the receiving water meeting applicable water quality criteria and DEQ has determined that both designated uses and existing uses will be protected. Under DEQ’s antidegradation guidance, a short-term and temporary lowering of water quality does not require a full antidegradation review required under state antidegradation rules.”

Small (<2.5%) use of assimilative capacity

As an initial tier of review, if DEQ receives a request for a new or increased pollutant load, the agency will consider the impact that it has on the assimilative capacity of the pollutant. If the new or additional pollutant load would increase the concentration of the pollutant in the receiving water such that the assimilative capacity would be lowered by 2.5% or less, DEQ will document the calculation in the permit fact sheet and state that the increased load will result in a de minimis lowering of water quality and does not require a full antidegradation review.

DEQ has concluded that such a small lowering of water quality is so minimal that it is not a good use of agency resources to track and analyze cumulative impacts. It is very unlikely that there will be more than four new or increased loads below the 2.5% threshold within an assessment unit. For proposed loads above the 2.5% threshold, but below the 10% threshold, DEQ will track and analyze cumulative impacts.

Cumulative Increases

Permit writers should analyze cumulative impacts, if, from the date of this memo, there are multiple new or increased loads that would impact the same assessment unit for the same pollutant and at least one of them would result in greater than a 2.5% use of assimilative capacity.

Permit writers should calculate cumulative increases based on the water quality at the time the first new or increased load in the assessment unit is requested, following the date on this memorandum. For example, if DEQ authorizes a permit for an increase in the amount of copper discharged into an assessment unit in 2019, that is the date for which the baseline water quality is calculated. If a second entity later wishes to discharge an increased amount of copper into the same assessment unit and this discharge will use more than 2.5% of the assimilative capacity, DEQ should calculate the combined impact of these two discharges compared to the baseline water quality. This would continue for each proposed new or increased load that uses more than 2.5% of the assimilative capacity within the assessment unit.

Once a proposed new or increased load would result in greater than a 10% use of assimilative capacity in the receiving water in combination with other new or increased loads of the same pollutant that have been authorized since the date of this memorandum, a full antidegradation analysis is required.

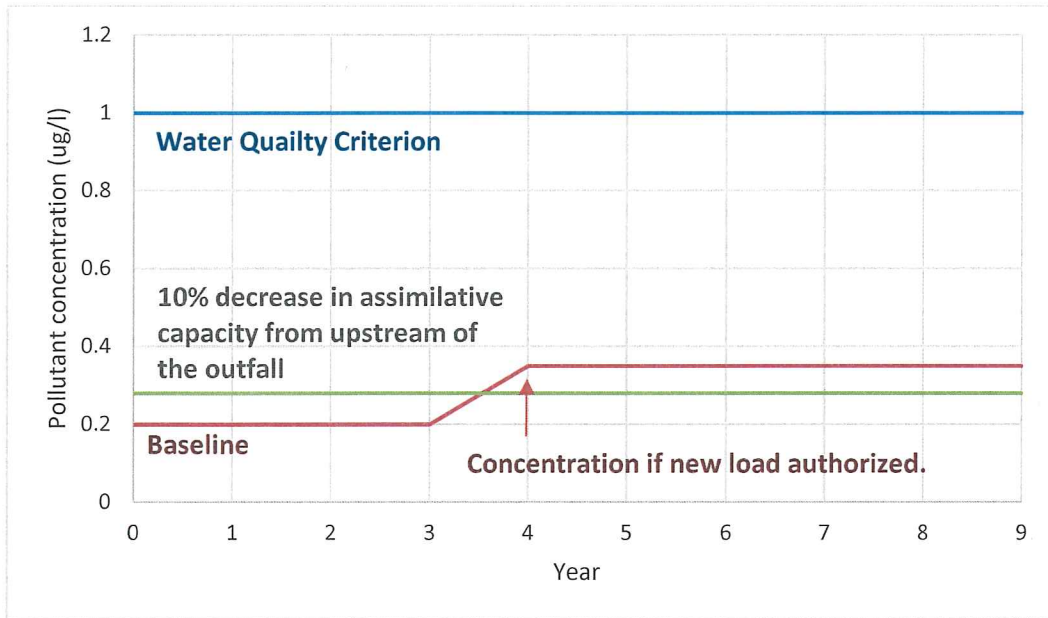
Potential Scenarios

The following three scenarios illustrate how this procedure could work. In all three of the following scenarios, a hypothetical water quality criterion for a pollutant is 1 µg/L and the worst case ambient concentration of that pollutant in the receiving water, before addition of the new or increased load, is 0.2 µg/L.

The assimilative capacity is the water quality criterion (1 µg/L) minus the baseline upstream water quality in the receiving water (0.2 µg/L), or 0.8 µg/L. A *de minimis* lowering of water quality would increase concentration of the pollutant by 10%, or 0.08 µg/L or less. Thus, if a discharge or combination of new or increased loads raised concentrations of the pollutant in the receiving water to greater than 0.28 µg/L, a full antidegradation review is required.

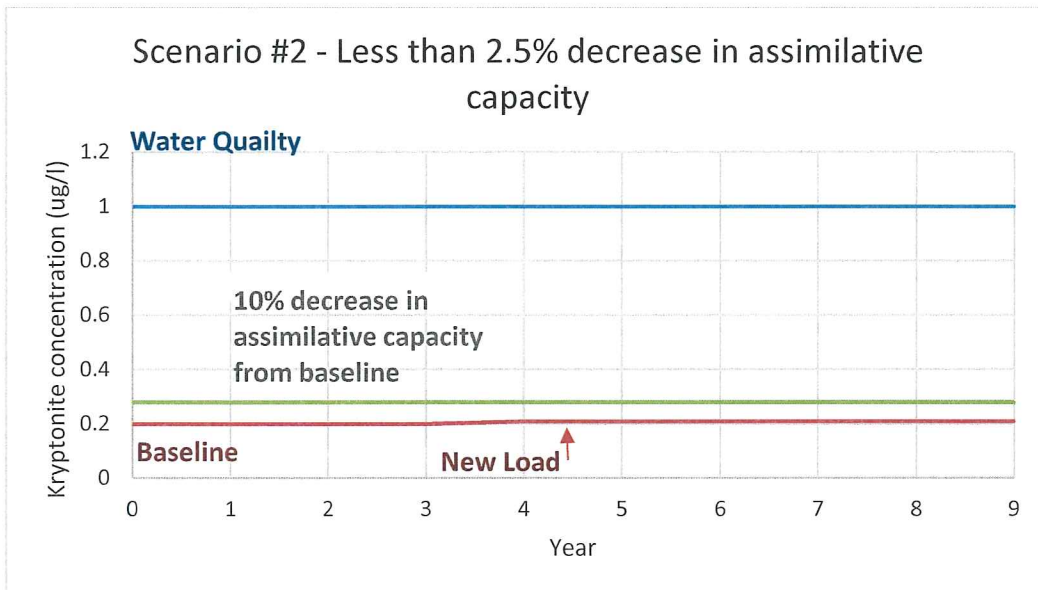
Scenario #1 – Single discharge results in greater than de minimis lowering of water quality

DEQ determines that during critical conditions and operating at full capacity, a new discharge would increase the concentration of the pollutant from 0.2 µg/L to 0.35 µg/L. In this case, the discharge would be greater than a *de minimis* lowering of water quality. A full antidegradation review is required.



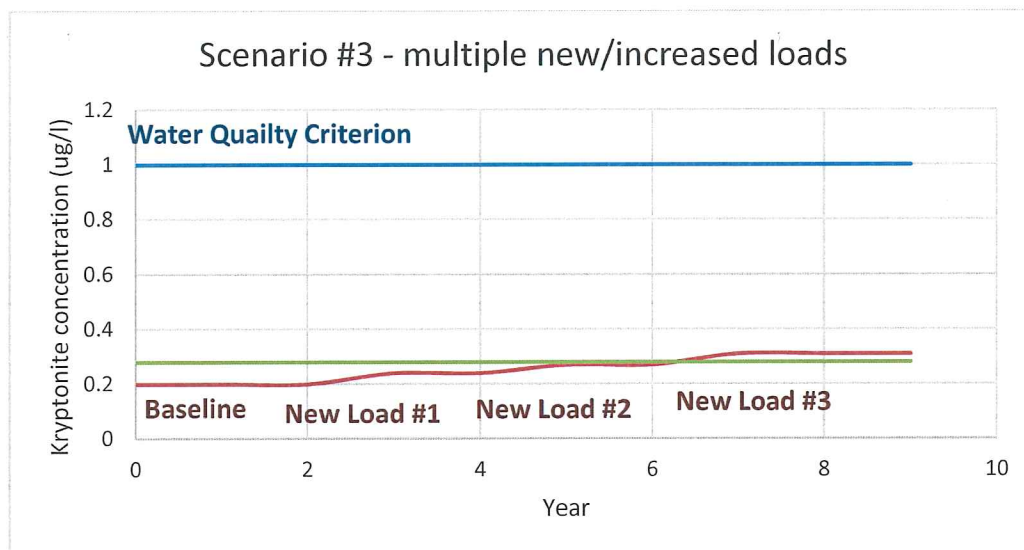
Scenario #2 – Single discharge results in small use of assimilative capacity

In this scenario, an entity applies to DEQ for a new permit. DEQ determines that the discharge would increase the concentration of the pollutant from 0.2 $\mu\text{g/L}$ to 0.21 $\mu\text{g/L}$. In this case, the discharge would be a *de minimis* lowering of water quality and less than 2.5%. No additional analysis is necessary. DEQ staff should document that the discharge is expected to be a *de minimis* lowering of water quality in the antidegradation portion of the Fact Sheet for the permit.



Scenario #3 – Multiple small discharges eventually result in greater than de minimis lowering of water quality

DEQ receives applications for multiple permits that will impact the same assessment unit. The first discharge would raise the concentration of the pollutant from 0.2 to 0.24 $\mu\text{g/L}$, which uses 5% of assimilative capacity. This discharge would be a *de minimis* lowering of water quality. The second discharge would further raise the concentration of the pollutant to 0.27 $\mu\text{g/L}$, still cumulatively a 8.8% use of assimilative capacity, which is still considered *de minimis*. The third discharge would raise the concentration of the pollutant to 0.31 $\mu\text{g/L}$, increasing the concentration higher than the *de minimis* threshold. A full antidegradation review is required before allowing the third discharge and any subsequent discharge of the same pollutant that would impact that assessment unit.



Procedure for determining if a lowering of water quality is greater than de minimis

The following procedure should be used to determine whether or not the lowering of water quality is *de minimis*. Ideally, the calculations described below should be done during the engineering review of the permit.

Step 1 – Determine baseline water quality of the parameter or parameter(s) in question and assimilative capacity for the parameter

Baseline water quality in the receiving water should be determined at the time the first application is made for a new or increased load of a given pollutant in the receiving water. The conditions should be determined during the time period of concern using reasonable worst case conditions. During this initial step, DEQ staff should determine if the baseline concentration for the pollutant or pollutants of concern already have been determined for another facility within the same assessment unit.

Example

ABC Industries is applying for a new permit. DEQ determines that the facility's discharge will require an effluent limit for ammonia. DEQ examines existing data and finds 25 data points for total ammonia nitrogen in the area of the discharge. DEQ calculates that the 95th percentile of concentration is 9.7 mg/L TAN. DEQ also calculates

that the median low flow of the receiving water is 50 MGD and the facility has a dry weather design flow of 4.0 MGD.

Step 2 – Determine 10% of the assimilative capacity of the waterbody

Calculate 10% of the assimilative capacity of the waterbody. The assimilative capacity is calculated as the applicable criterion minus the baseline concentration. The result should be divided by 10 and added to the baseline concentration to determine the 10% *de minimis* threshold in the receiving water.

Example (Step 2): During the critical lowflow period, the chronic and acute ammonia criteria, based on existing temperature and pH, are both 17 mg/L TAN. The assimilative capacity of ammonia in the waterbody is 7.3 mg/L, based on the baseline concentration of 9.7 mg/L and the criteria of 17 mg/L. Ten percent of the assimilative capacity is 0.73 mg/L. Thus, for a cumulative lowering of water quality to be *de minimis*, it must result in a concentration of ammonia in the waterbody of less than 10.43 mg/L (9.7 mg/L baseline concentration plus 10% of assimilative capacity of 0.73 mg/L).

Step 3 - - Determine if the discharge would result in lowering water quality by more than 10% of the assimilative capacity

Permit staff should calculate the percentage of assimilative capacity that will be taken by the discharge. If a mixing zone is authorized for the facility for the parameter of concern, the assimilative capacity should be calculated based on the calculated concentration at the edge of the mixing zone.

Example (Step 3). The proposed design of ABC Industries' treatment plant is a dry weather design flow of 4.0 MGD. ABC estimates that they will be able to treat ammonia to a monthly average 8.0 mg/L. The discharge will result in a ammonia concentration in the receiving water of:

$$9.7 \text{ mg/L} + 8.0 \text{ mg/L} * (4.0 \text{ MGD} / 50 \text{ MGD}) = 10.34 \text{ mg/L}.$$

The concentration is less than the cap of 10.43 mg/L. In this case, the discharge would be considered *de minimis*. DEQ would need to document these calculations in the permit and state that the discharge would lower water quality less than a *de minimis* amount and that a full antidegradation review isn't required.

Step 4 – Determine if the discharge would result in a cumulative lowering of water quality by more than 10% of the baseline assimilative capacity

Permit staff should determine if DEQ has authorized other new or increased loads within the same assessment unit since the date of this memorandum and determine if, cumulatively, previously permitted new or increased loads in combination with the load being considered would result in more than a 10% cumulative impact. In addition, if any

loads have decreased since baseline was calculated, such as due to closure of a facility or improved treatment processes, DEQ should consider that in its calculation.

Example (Cumulative Impacts). A few years after ABC Industries obtains a permit, a second facility, QED Corporation, proposes a facility a few miles upstream of ABC within the same assessment unit. QED also will have an effluent limit for ammonia. Average dry weather design flow is 1.5 MGD and the effluent limit is 7.8 mg/L. Assuming a full mix, the discharge will increase ammonia concentrations at the edge of the mixing zone by:

$$(7.8 \text{ mg/L}) * (1.5 \text{ MGD} / 50 \text{ MGD}) = 0.23 \text{ mg/L}.$$

This would raise the ammonia concentration to $10.34 + .23 = 10.57 \text{ mg/L}$, which is greater than the cumulative cap of 10.43 mg/L . As a result, a full antidegradation analysis would be required before determining if this discharge, or any future new or increased load of this pollutant to the assessment unit, should be authorized.