**Items for RWG Discussion June 30 re:**

**“Background Pollutant Allowance” Rule**

The following are issues/options DEQ would like to discuss with the RWG at the June 30 meeting based on the comments we received from the workgroup in mid-June on our “Draft Background Pollutant Allowance Issue Paper” and discussion draft rule language.

In addition, DEQ made a few changes to the draft rule wording in response to comments received, which are highlighted in yellow below, and will address other issues/concerns either in the discussion section of the issue paper or in a Q&A section to be added.

DEQ continues to recommend, at a minimum, the background pollutant allowance provision as described in Option 1 in the attached issue paper. DEQ received several suggestions for broadening the applicability of that provision. DEQ solicits the input of the workgroup regarding whether the provision should be broadened as described in Options 2 and/or 3 below. Note that these options are not mutually exclusive, but that each option potentially builds upon the more narrow provision proposed by DEQ.

Does the workgroup support broadening the applicability of the background pollutant allowance? What are your thoughts on including Option 2 in addition to the provision recommended by DEQ?

Option 2:

1. The source of the pollutant is the facility’s intake water.
2. Intake waters could include multiple surface and groundwater sources, but no more than 50% of the pollutant mass load in the discharge may be attributable to groundwater sources.
3. **The pollutant concentration in the effluent must be equal to or less than the upstream ambient concentration in receiving water.**
4. The provision would only apply to human health criteria.
5. The criterion is exceeded in the water body upstream of the discharge.
6. The pollutant is not added by the facility through their process (i.e. there is no increase in the mass load of the pollutant to the receiving water above that attributable to the facility’s intake water).
7. All aquatic life criteria and technology based effluent limits must be met.
8. There is no technologically and economically feasible means to further reduce the pollutant concentration in the discharge.

Implications of Option 2:

* This additional provision was suggested because DEQ’s recommended provision would not be available to the many facilitates that obtain their intake water or a portion of it from sources other than the receiving stream for the discharge.
* The background pollutant allowance would not be limited based on the source of the intake water, except for a limit to the pollutant load originating from groundwater.
* Because pollutant loads that originate from waterbodies other than the receiving water bring additional flow as well, in some cases the discharge may reduce the instream concentration. Under this option the discharge pollutant concentration would have to be equal to or lower than the ambient stream concentration.
* The justification for this option would need to assert that a small addition of pollutant load would not impair beneficial uses as long as the pollutant concentration is constant or reduced.
* In some cases the pollutant of concern may not be in the groundwater source. Yet Option 1 would be unavailable to sources that use groundwater for part of their intake water.
* For persistent bio-accumulative toxic pollutants, the total mass load may be a concern because the pollutant will persist in the water body and has the potential to bioaccumulate through the food chain into fish, among other organisms.
* As with Option 1, this provision would be limited to facilities that do not add the pollutant through their process, but obtain the pollutant entirely through their intake water.

Option 3.

Michael Campbell proposed two additional changes to Option 1:

1. Allow a 3% increase rather than 1% increase.

2. Use the full river flow basis (30Q5 or harmonic mean flow) for the Willamette and Columbia Rivers to calculate the concentration increase rather than limiting the river flow basis to 25%.

Implications of Option 3:

* The table below shows some hypothetical calculations showing the difference between allowing a 1% and a 3% increase. These scenarios are not real because the criterion is actually below the quantitation limit, but represents how the calculations would look if the pollutant were measurable.
* The difference between organism only criteria based on a 10-6 and 10-5 consumption rate is a factor of 10.

A criterion of 1.4 becomes 14 when you change from a risk of 10-6 to 10-5

If that criterion value increases 1%, it becomes 1.41

An increase of 3% brings it to 1.45

* If the full flow basis for the Willamette and Columbia are allowed, this is a potentially large load addition to these large rivers.
* If one believes that load is not an issue and we need be concerned only about concentration, this would not be a problem. However, DEQ believes that in the spirit of overall toxics reduction and particularly for persistent bioaccumulative pollutants, additional loading should be limited on rivers that already exceed the criteria.

|  |  |  |  |
| --- | --- | --- | --- |
| **Pollutant** | D-toxin |  |  |
| **Criterion (Fish + Water)** | 0.000052 ug/l |  |  |
|  |  |  |  |
| **Small River** | | | |
| Harmonic Mean Flow (cfs) | 50.4 | |  |
| Ambient Conc. (ug/l) | 0.007 | |  |
| Effluent Flow (mgd) | 0.028 | |  |
| Effluent Conc. (ug/l) | (6x Ambient) 0.042 | |  |
|  |  |  |  |
| % Change in Waterbody | Final in-stream conc. | Effluent discharge conc. | |
|
| 1.087% | 0.00708 | 0.042 | ug/l |
| 1% | 0.00707 | 0.041 | ug/l |
| 3% | 0.00721 | 0.11 | ug/l |
| 5% | 0.00735 | 0.18 | ug/l |
|  |  |  |  |
|  |  |  |  |
| **Large River (Scenario 1)** | | | |
| Harmonic Mean Flow (cfs) | 8510 | |  |
| Ambient Conc. (ug/l) | 0.007 | |  |
| Effluent Flow (mgd) | 0.028 | |  |
| Effluent Conc. (ug/l) | (6x Ambient) 0.042 | |  |
|  |  |  |  |
| % Change in Waterbody | Final in-stream conc. | Effluent discharge conc. | |
|
| 0.007% | 0.00700 | 0.042 | ug/l |
| 1% | 0.00707 | 6.0 | ug/l |
| 3% | 0.00721 | 18 | ug/l |
| 5% | 0.00735 | 30 | ug/l |
|  |  |  |  |
| **Large River (Scenario 2)** | | | |
| Harmonic Mean Flow (cfs) | 8510 | |  |
| Ambient Conc. (ug/l) | 0.007 | |  |
| Effluent Flow (mgd) | 10 | |  |
| Effluent Conc. (ug/l) | (10x Ambient) 0.070 | |  |
|  |  |  |  |
| % Change in Waterbody | Final in-stream conc. | Effluent discharge conc. | |
|
| 3.8% | 0.00728 | 0.070 | ug/l |
| 1% | 0.00707 | 0.020 | ug/l |
| 3% | 0.00721 | 0.054 | ug/l |
| 5% | 0.00735 | 0.087 | ug/l |

ISSUE PAPER SECTION ON

“Background Pollutant Allowance” – a Toxics Standards Provision

Description of Tool

The “background pollutants allowance” would be a water quality standard provision contained in the toxics standard rule (see below for draft rule language). This rule would allow certain permittees to discharge effluent at concentrations above the numeric criterion under the following limited circumstances:

Option 1

1. The facility obtains its water from the same water body or hydrologically connected water (see the intake credit rule definition) that it discharges to.
2. The provision would only apply to human health criteria.
3. The criterion is exceeded in the water body upstream of the discharge.
4. The source of the pollutant is the facility’s intake water.
5. The pollutant is not added by the facility through their process (i.e. there is no increase in the mass load of the pollutant in the receiving water).
6. The increase in concentration in the receiving water from the upstream ambient concentration is not greater than:
   1. 1% calculated using 100% of the 30Q5 flow of the receiving stream; or
   2. 1% for the Willamette and Columbia Rivers calculated using 25% of the 30Q5 flow of the river.
7. All aquatic life criteria and technology based effluent limits must be met.
8. There is no technologically and economically feasible means to further reduce the pollutant concentration in the discharge.

Applicability/Scope

This tool would apply only to facilities that discharge a pollutant to a water body that exceeds the water quality criterion for that pollutant immediately upstream of the discharge. The facility must also meet all the conditions listed above. This means that the provision would apply to facilities that take water in that contains the pollutant and concentrate it through one of their processes, even though they do not add the pollutant to the wastewater. This would primarily include non-contact cooling processes, but could also include other processes that cause a decrease in water volume but leave the mass of the pollutant constant, thereby concentrating the pollutant.

DEQ does not expect that this provision will be very useful for municipal wastewater treatment plants, but there may be a few exceptions. Most municipal wastewater treatment plants would not be able to meet the required conditions, in part because they receive their inflow from a variety of sources (e.g., households, industry). Frequently, municipal water supply is from variety of original sources as well, possibly including both groundwater and surface water sources.

DEQ Recommendation

DEQ recommends that we pursue adoption of a background pollutant allowance as a water quality standard provision. DEQ finds this alternative preferable to a multiple discharger variance or general permits for addressing the issue of background pollutants in intake water. The reasons for this are discussed below.

Policy issues and objectives

This provision is intended to address situations where a facility receives pollutants with their intake water that become concentrated before the facility discharges the water back into the same water body, but does not contribute additional mass of the pollutant to the water body. This may occur where a water body contains pollutants that are natural or that originate from other upstream sources and a downstream facility that uses river water for non-contact cooling, for example. Without this provision, such a facility may be required to remove pollutants that were generated by other upstream sources. In some cases, this could make it infeasible for the facility to use the water, yet industrial water supply is a designated beneficial use of the waters of the state.

Without this provision, facilities that discharge to water bodies that exceed the water quality criterion for the discharged pollutant are required to meet the criterion in their effluent at the “end of pipe,” before it enters the receiving water. Because the intake water already exceeds the criterion, they would not be able to meet the criterion in their discharge without treatment, even though they add no mass of the pollutant through their process or activity. The intake credit rule is a solution for facilities that take the water in and discharge it back to the river with no increase in mass or concentration. However, the intake credit rule may not be used if the facility increases the concentration of the pollutant. Therefore, facilities that reduce the water volume through evaporative cooling or other processes and thereby leave a constant pollutant mass load in a smaller volume of water, may not take advantage of the intake credit provision.

The objective of this policy is to provide a solution that:

1. protects human health,

2. is fair to facilities in the predicament described above, and

3. is not overly burdensome to the Department or the facilities to administer.

Streams that exceed water quality criteria, once listed as impaired, are subject to a TMDL, which will identify the sources of the pollutants and assign wasteload and load allocations to reduce the pollutant loads and meet the water quality standards. Through this process, the pollutant load in the water body will be reduced. As the ambient load is reduced, the concentration in the discharge of facilities using the stream for intake water will also be reduced.

Policy evaluation

**Advantages and disadvantages.**

The advantages of this tool include:

1. It provides a fair and reasonable implementation tool. Facilities who do not contribute a pollutant will not be required to clean up the pollution generated by other sources as long as their activity of concentrating that pollutant does not represent a significant added human health risk.

2. Once adopted, this tool would be a more administratively efficient means to accomplish the policy objective for this particular circumstance than having to issue variances. Therefore it would be less costly for the Department, for the permittee and for EPA.

3. This provision would provide more regulatory certainty for sources than a variance approach, at least at this time when DEQ and EPA Region 10 experience with variances is very limited.

4. This meets the EQC policy objective of an environmentally meaningful and cost effective implementation tool for permitted sources.

Disadvantages of this tool include:

1. There is no precedence for this type of standards provision elsewhere.

**Alternatives considered for the definition of an allowed “limited increase.”**

Three primary alternatives were considered for how to define an allowed limited, or “de minimis,” increase that would not present a significant added risk to human health. Because this provision would apply only to reaches where the ambient upstream concentration exceeds the criterion, there is an existing human health risk concern in the water body.

DEQ recommends option 1, or a variation of this approach, and does not recommend using an alternate fish consumption rate or risk level as described in options 2 & 3.

Option 1 (DEQ recommended approach): An increase of not more than 1 % (or 3%) is allowed in the receiving water.

The rationale for this definition of an allowed limited increase is that the source/discharge in question is not contributing an additional incremental human health risk of any significance to the existing situation. While the existing pollutant load in the river is a concern, the source will increase the concentration by a very small amount and will not increase the mass load of the pollutant in the river at all. They are only concentrating the pollutant load that was in their river intake water by reducing the volume of water it is diluted in.

With this option, the rule or implementation guidance must specify how the percent increase is calculated; including what the increase is from and what amount of mixing back with the river flow will be allowed.

Advantages:

* The allowed increase would be the same regardless of pollutant, upstream ambient concentration or location.
* The allowed increase would be relatively simple to calculate.

Disadvantages:

* There would be a slight increase in concentration in streams that exceed the criterion.
* This option would not limit the discharge concentration to an alternate calculated value that could clearly meet EPA’s 2000 human health methodology.

Option 2: The calculated value of a human health criterion using a cancer risk level of 10-4 or 10-5 .

In this case the discharge would have to meet a criterion that is calculated based on a higher human health risk value rather than 10-6, which is the basis of Oregon’s water quality criteria. The rule would need to define whether this limit would apply at the end of pipe or would allow some mixing with the receiving water.

Advantages:

* DEQ could clearly justify that this increase would be sufficiently protective of human health according to EPA guidance, because it would be calculated according to the same method used to derive the criteria and would use a high fish consumption rate of 175 g/d (i.e. a rate above EPA’s subsistence rate of 144 g/d).

Disadvantages:

* This option would only apply to carcinogens, which are based on a cancer risk level. Non-carcinogens are based on a total exposure reference dose.
* In some cases, the ambient background may already exceed the 10 -4 or 10-5 based value. In these cases, this alternative would not provide a solution to the intake pollutants concentration problem.
* In some cases, this may be a larger increase than is desirable. A risk level of 10-4 is 100 times greater than a risk level of 10-6, and a risk level of 10-5 is 10 times greater. If this was applied in the effluent (end-of-pipe), depending on the dilution available, this approach could allow a larger increase than 1% after mixing for many pollutants, although that is less likely for criteria based on 10-5. For example, in the case of arsenic, the proposed organism only criterion, based on a risk level of 10-6, is 2.7 µg/l. An arsenic value based on 10-4 is 270 µg/l. If the background concentration is 5 µg/l, a discharge concentration of 270 µg/l may result in an instream concentration of more than 5.5 µg/l, depending on the amount of mixing allowed.

Option 3: The calculated value of a human health criterion calculated based on a lower FCR.

Advantages:

* DEQ could justify that this increase would be sufficiently protective of human health according to EPA guidance if we could find an acceptable fish consumption rate lower than 175 g/d. Perhaps we would estimate a site specific consumption rate based on fish harvested from the water body where the discharge is located.

Disadvantages:

* In some cases, the ambient background will already exceed the value based on a lower consumption rate. Therefore, this option would not provide a solution to the intake pollutant concentration problem.
* Current 303d listings based on water quality data (as opposed to fish advisories) are based on human health criteria that were calculated using a fish consumption rate of 6.5 g/d. This option would not provide a solution for any water body currently listed.
* It could be difficult to establish an acceptable lower fish consumption rate to use as the basis.

**Alternative tools considered to address background pollutants in intake water.** The following tools are alternative means to address the situation where pollutants are present in the ambient water upstream of the discharge and are in the facilities intake water:

1. a multiple discharger variance for non-contact cooling water facilities

2. individual variances, and

3. general permits.

A discussion of these implementation tools is included in other sections of this “NPDES Implementation Tools” issue paper.

A variation to the proposal is that it would apply to pollutants in any intake water and not be limited to intake water from the receiving water body. For example, if the source water included groundwater that would not otherwise enter the water body within a reasonable time frame. Proponents of this variation assert that if the increase is truly insignificant from a human health perspective it should not matter where the intake pollutants are from. Opponents would suggest that in the latter case, additional mass of the pollutant is being added to the water body and that for persistent pollutants this should not be allowed, particularly when the water body already exceeds the criterion.

DEQ does not recommend this variant. Based on discussions of the RWG regarding the need for this provision and uncertainty regarding its use, DEQ recommends keeping the provision focused on the specific circumstances described above and included in the proposed language below.

**Summary of RWG discussion and views.**

There is general agreement amongst Rulemaking Workgroup members with the policy objective stated above.

The permitted facility representatives emphasize the need for the implementation solution to be fair, provide regulatory certainty and be cost-effective. Their view is that in this situation the facility is not contributing to the human health risk because there is already a problem in the river and the effect of their facility is relatively negligible or “*de minimis*.”

The environmental organizations on the Rulemaking workgroup emphasize the need to ensure that the human health impact is negligible, perhaps even within the margin of error or certainty that there would be any change in human health risk due to the facility at all. Some of the environmental organizations have the view that even though a facility does not contribute a pollutant, if they concentrate the pollutant through their activity they are contributing to the problem and the standards violation, because standards are written as instream concentrations.

Proposed rule language

OAR 340-041-0033 (3). A 1% increase in the background pollutant concentration of a water body that exceeds an applicable human health criterion based on a fish consumption rate of 175 grams/day for that same pollutant, is allowed if all the conditions listed in this rule section [OAR 340-041-0033(3) (a) through (f)] are met. This limited incremental increase in the background pollutant concentration will not further impair the beneficial uses of Oregon waters or result in a significant added human health risk.

1. For the purpose of this section, “background pollutant concentration” means the ambient water body concentration immediately upstream of the discharge, regardless of whether those pollutants are natural or result from upstream human activity.
2. The increase is caused by the existing discharge of a permitted facility.
3. The mass of the pollutant in the discharge does not exceed the mass that is attributable to the pollutant in the facility's intake water and therefore the discharge does not increase the mass load of the pollutant in the receiving water body.
4. The 1% increase above the background pollutant concentration is calculated:
   1. For the Willamette and Columbia Rivers, using 25% of the 30Q2 flow of the water body;
   2. For all other waters, using 100% of the 30Q2 flow of the water body.
5. The discharge complies with all applicable technology-based effluent limits, other applicable water quality standards, and the provisions of any applicable total maximum daily load.
6. No other technologically and economically feasible means that would not have significant adverse environmental consequences are available to reduce the pollutant concentration in the discharge to the applicable water quality criterion.

Authority and precedence

This provision is within the state’s authority to establish water quality standards under the Clean Water Act and under State statutory authority for the EQC to adopt rules and implement the CWA in Oregon. DEQ must provide supporting documentation to EPA that demonstrates that “101a” uses (swimming and fishing, for human health) and other beneficial uses designated by the state are protected by the proposed criteria. EPA must approve or disapprove the criterion based on whether they conclude that it will protect uses and meet the requirements of the CWA.

DEQ is not aware of any precedence for this approach being explicitly used for toxics criteria. The general approach of allowing a minimal relative increase of a pollutant such that it does not impact the beneficial uses has been used for other parameters, such as temperature and turbidity, though the circumstances of each of these is different. For example, both temperature and turbidity include provisions that allow a limited increase from ambient conditions. These criteria are based on effects to aquatic life, they are pollutants that are part of the natural environment and have a high degree of variability, and the criteria are not derived from calculations that take into account exposure and risk.

Other supporting information

**Rationale for beneficial use protection.**

Where a water body is already water quality limited for a human health criterion, DEQ believes that a 1% or less additional increase in concentration for a spatially limited section of river where there is no increase in the mass load of the pollutant in the water body would not be reasonably likely to increase human health risk. The human health criteria for fish consumption are based on eating 175 grams per day of fish. People who eat that quantity of fish are obtaining them from multiple water bodies, often including marine waters. Only a very small portion of the fish eaten, if any, would be affected the 1% allowed increase in concentration in a spatially limited extent of the water body. For carcinogens, the risk is based on exposure over a life time, and even for non-carcinogens, the cumulative exposure to attain a level where effects occur could occur over a long period of time. Therefore, we would not expect the 1% incremental increase allowed through this provision in spatially limited stream reaches to measurably change the exposure to the pollutant received by people eating fish.

The human health risk that is present due to the fact that the river exceeds the criteria and the sources of the pollutant contributing to the exceedence should be addressed. If a community water supply intake is present in the reach of the stream that exceeds the criteria, they should take appropriate action. The insignificant incremental increase that would be allowed under this provision would not change the need for the water source to address the issue.