



Oregon

Theodore R. Kulongoski, Governor

Department of Environmental Quality

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December 19, 2003

Mr. Randy Smith, Director
Office of Water
U.S. EPA Region 10
1200 Sixth Avenue
Seattle, WA

Re: Oregon Responses to EPA Questions re: the State's water quality
temperature standards

Dear Mr. Smith:

As you know, on December 10, 2003, DEQ transmitted to the Environmental Protection Agency (EPA) recently adopted Oregon water quality standards, including revisions to our antidegradation, dissolved oxygen and temperature rules. These revisions address the concerns identified by the Federal District Court of Oregon in Northwest Environmental Advocates vs. EPA and National Marine Fisheries Service. As part of your preliminary review of our submission, EPA staff has requested DEQ to clarify the meaning and intent of several provisions in the newly revised rules. This letter provides the requested clarification.

Antidegradation

Oregon intends to continue to follow the process set forth in the document *Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications* (March 2001). However, we note that this guidance is now somewhat out of date and needs to be revised to conform to the new rules. We will provide you with a draft copy of these revisions prior to our re-adoption of the document.

OAR 340-041-0004(9)(a)(D)(iv) states the following:

(iv) Under extraordinary circumstances to solve an existing, immediate and critical environmental problem, the Commission or Department may, after the completion of a TMDL but before the water body has achieved compliance with standards, consider a waste load increase for an existing source on a receiving stream designated water quality limited under OAR 340-041-0002(62)(a). This action must be based on the following conditions:

(I) That TMDLs, WLAs and LAs have been set; and

(II) That a compliance plan under which enforcement actions can be taken has been established and is being implemented on schedule; and

(III) That an evaluation of the requested increased load shows that this increment of load will not have an unacceptable temporary or permanent adverse effect on beneficial uses or adversely affect threatened or endangered species; and

(IV) That any waste load increase granted under subparagraph (iv) of this paragraph is temporary and does not extend beyond the TMDL compliance deadline established for the water body. If this action will result in a permanent load increase, the action has to comply with sub-paragraphs (i) or (ii) of this paragraph.

The intent of this language is to make it clear that Oregon may allow an increased discharge into an impaired water body so long as the certain conditions set out in the rule are met, including the completion of a TMDL, and that the increased discharge will not prevent the TMDL allocations from being met. Although the language authorizes a potential increased discharge into an impaired water body, it is not intended to do so by eliminating or bypassing the antidegradation review routinely performed for any proposed new or increased pollutant discharge into a high quality waters (as described in the Internal Management Directive discussed above).

Natural Conditions

The revised rules make it clear that where DEQ identifies a natural condition which is less stringent than the numeric criteria set out in the State's water quality standards, the natural condition supercedes the numeric criteria. Examples of natural conditions include but are not limited an eroding ore deposit, and the natural thermal potential of a stream.

If DEQ is aware of information documenting an exceedance of the numeric criteria, we will list that water body as impaired on our next 303(d) list unless we are also aware that the exceedance is a natural condition. We will use the TMDL process or a similar technical inquiry to further investigate whether the exceedance may be attributed to a natural condition. If we reach the conclusion that the exceedance is solely attributed to a natural condition, we would terminate the TMDL and submit our findings to EPA for approval.

In the case of temperature, the revised criterion requires that where a water body or segment's water temperature under natural conditions exceeds the numeric criterion, then the natural condition is the applicable water quality criterion for that water body. Natural temperatures are those that would exist in the absence of human activities that alter stream temperatures. DEQ views numeric criteria that reflect natural conditions to be protective of salmonid designated uses because river temperatures prior to human impacts clearly supported healthy salmonid populations.

Natural temperature conditions will be determined using a scientifically-defensible method that utilizes the best available data. Typically, this analysis is performed in the context of a TMDL.

Overview of Methods to Estimate Natural Background Temperatures:

There are a number of different ways of estimating natural temperature conditions for the purposes of applying this narrative criterion. These include:

- (1) Demonstrating that current temperatures reflect natural conditions,
- (2) Using statistical or computer simulation models,
- (3) Using a non-degraded reference stream for comparison,
- (4) Using historical temperature data, and
- (5) Assessing the historical distribution of salmonids.

For water temperature, DEQ will be relying principally on methods 1, 2 and 3, but may find the other methods useful for any given analysis. For other parameters, DEQ has used one or more of these methods to determine natural background.

Demonstrating That Current Temperatures Reflect Natural Conditions:

Under this approach, the past and present human activities that could impact the river temperatures are documented and a technical demonstration is made that the human activities do not currently impact temperatures. This approach is most applicable to non-degraded watersheds (e.g., State and National parks, wilderness areas, and protected State and National lands). These watersheds can be used as "reference" streams for estimating the natural background temperatures of degraded streams (see below). If there is a small human impact on temperatures, it may also be possible to estimate the human impact and subtract it from current temperatures to calculate the natural temperatures.

Comparisons to a Reference Stream:

It is often reasonable to assume that the natural temperatures of a thermally degraded stream are similar to those of a non-degraded stream, so long as the location, landscape context, and physical structure of the stream are sufficiently similar. The challenge to this approach is finding a reference stream that is of similar location, landscape context, and physical structure. Because large rivers are unique and most in the Pacific Northwest have been significantly impacted by human activities, this approach is most applicable to smaller streams where a reference stream with current temperatures at natural conditions exists.

Temperature Models:

DEQ estimates the natural thermal potential of Oregon streams using a process model known as "Heat Source". This modeling is generally a two-step process. As a first step, the current river temperatures are measured through ambient monitoring, and infra red technology. The watershed's current physical characteristics (e.g., amount of shade provided by the canopy, river geometry, significant cold water flows, point source inputs, etc.) are also recorded. Using this information, a model of each watershed is created that simulates its current temperature conditions. The model calibrated by comparing the simulated temperatures with the actual measurements.

Once the model is calibrated, the second step involves changing the system's physical characteristics to represent natural conditions. Examples of these changes are removal of

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point source discharges from the model inputs, changing the model hydrodynamics from impounded conditions due to a dam to free-flowing conditions, and increasing the riparian shade to represent a natural forest. Since process models do not rely upon data from reference locations so they can be used for rivers that have no suitable natural reference comparisons available. Thus, process models are well suited for estimating natural conditions for larger streams and rivers.

Process-based models are also useful for understanding the basic mechanisms influencing water temperature in a watershed, understanding the relative contributions from different sources at different locations, understanding cumulative downstream impacts from various thermal loads, performing "what if" scenarios for different mitigation options, and setting TMDL allocations.

Implementation

DEQ intends to develop and distribute training materials and internal management directives to our permit writers and TMDL personnel. These materials will build upon similar existing materials where available and revised to reflect the new rules. As with other State program implementation documents, we will provide you with a copy prior to our final adoption.

DEQ is certainly willing to check in with EPA over the next few years to discuss the implementation of these revisions.

Oregon looks forward to EPA's review and approval of our water quality standards. If you require any additional information or clarification of these rules, please contact me or have your staff call Mark Charles, water quality standards manager at (503) 229-5589.

Sincerely,



Michael T. Llewelyn, Administrator
Water Quality Program

Cc:

Mark Charles
Paula van Haagen
Mary Lou Soscia