COMMONWEALTH OF VIRGINIA

Department of Environmental Quality

Office of Water Permit Support

629 East Main Street Richmond, Virginia 23219

MEMORANDUM

Subject: Guidance No. 01-2012 - Siting of Storm Water BMPs in Surface Waters and the Application of Temperature Standard to Impoundments

To: Regional Directors

From: Larry G. Lawson

Date: April 18, 2001

Copies: Regional Permit Managers, Regional Water Permit Managers, Regional Compliance and Enforcement Managers, Martin Ferguson, Alan Pollack, Jean Gregory, Richard Ayers, Dale Phillips, Ellen Galinsky, Joe Hassell, George Cosby

Background:

A variety of impoundments are being proposed in the state to provide for a variety of uses. The impoundments range from large multi-use structures to small sediment trapping basins. The uses they provide may include: flood control, recreation, water supply, power generation, flow augmentation, silt/sediment control, irrigation, storm water BMPs and livestock water supply. Many of these impoundments require a permit from the Board for their construction, operation and maintenance.

Impoundments have the potential to significantly alter the aquatic environment in the inundated area and may alter the environment downstream from the impoundment. It has recently come to our attention that there is inconsistency in the way we permit such facilities and the way water quality standards are interpreted and applied in our permits for these facilities.

The purpose of this guidance is to recommend a consistent approach to permitting these facilities and a consistent application of the temperature standards to impoundments in permanent or intermittent stream channels.

Please note that this guidance updates and replaces OWRM guidance #95-001

Definitions:

For clarity and in order to avoid confusion, selected terms have the following meanings as used hereafter in this document:

Permanent (Perennial) Stream: a waterway that contains water at all times during a typical year and that has, or could have, a well established aquatic community.

Intermittent Stream: a waterway that contains flowing water at times during a typical year when groundwater provides water for the stream flow, but does not contain water at all times, particularly during dry periods. These streams are likely to have an active aquatic community for at least part of the average year.

Ephemeral Stream: a waterway such as a drainage way, ditch, hollow or swale that contains water only during or for a short duration after precipitation events in a typical year.

Impoundment: a structure, regardless of its size or intended use, to gather and store surface water that captures the flow of, and is constructed in the channel of, a permanent or intermittent stream.

Pond: a structure to gather and store surface water that may or may not be constructed to include the channel of ephemeral streams. A pond does not capture the flow of and does not include the channel of a permanent or intermittent stream.

Natural Temperature: that temperature of a body of water due solely to natural conditions without the influence of any point source discharge.

Temperature Standards:

The water quality standards establish four criteria for temperature in state waters:

- 9 VAC 25-260-50 establishes a maximum temperature that may not be exceeded.
- 9 VAC 25-260-60 establishes a limitation on the rise above the natural temperature of a water body.
- 9 VAC 25-260-70 establishes a limitation on the hourly rate of temperature change.
- 9 VAC 25-260-80 establishes restrictions on point source discharges to impoundments.

9 VAC 25-260-50, applies at stream flows equal to or greater than the 7Q10. It does not apply during lower flows. There is no low stream flow associated with 9 VAC 25-260-60, 9 VAC 25-260-70 and 9 VAC 25-260-80.

9 VAC 25-260-60 also provides the definition for "natural temperature" as that temperature of a body of water due solely to natural conditions without the influence of any point source discharge. Note that this is an important definition because it does not necessarily exclude anthropomorphic impacts, other than point source discharges. For example, a rise in temperature due to the discharge of heated cooling water is clearly not a "natural condition" according to this definition. However, an increased temperature that is the result of increased sunlight input (due to removal of forest cover) is not necessarily excluded from, and could be considered as, a natural condition.

Interpretation of the standards:

9 VAC 25-260-50, 9 VAC 25-260-60 and 9 VAC 25-260-70 are discussed in this section. 9 VAC 25-260-80 is discussed later in this document.

When an impoundment or pond is constructed, it is likely that the temperature of the stored waters will be higher than the temperature of the feeder streams. This is true even when there is no point source discharge of thermal energy to the impoundment. The temperature that will result is due to conditions that may include, increased sunlight input, decreased shading, decreased turbulence, thermal stratification, etc. all of which are the "natural" result of impounding a stream or creating a pond. Thus, it can be argued that the resulting temperature within an impoundment or pond and for some distance downstream, regardless of its final value, does not violate the requirements of 9VAC 25-260-50, 9VAC 25-260-60 or 9VAC 25-260-70 in the absence of a point source discharge of thermal pollution.

Implementation - Impoundments:

DEQ is not supportive of the construction of impoundments in the channel of permanent or intermittent streams. Specifically, this also applies to sedimentation basins and other storm water BMPs. DEQ believes and recommends that such projects should be permitted only in situations where the following criteria have been met:

- An alternative analysis has been performed and no practicable alternative exists.
- The alternative analysis has demonstrated that the adverse environmental impacts caused by the impoundment are less damaging than the harm caused by uncontrolled storm water or the benefits of the impoundment are in the public interest and such interests exceed the adverse environmental impacts expected from its construction and maintenance.
- The alternative analysis has demonstrated that the permittee will take all reasonable steps to: (1) avoid adverse environmental impacts, (2) minimize the adverse impact where avoidance is impractical and (3) provide mitigation of the adverse impact on an in kind basis where applicable.
- A demonstration that the siting of the facility, its operation and maintenance will not adversely impact the instream beneficial uses or result in substantive degradation of water quality.
- A comprehensive operation and maintenance plan has been developed.

When no practicable alternative exists, permits for the construction of impoundments may be issued. However, since it is unreasonable to issue a permit authorizing a project and simultaneously to impose permit conditions that are known to be very unlikely be met, the recommendations for the implementation of the temperature standards relative to impoundments is based on the following concept:

> Temperature along with all other applicable parameters are valid concerns and should be addressed when the issuance of a permit to allow the construction of an impoundment is being considered. Appropriate restrictions and conditions may be placed in a permit that are intended to avoid and/or minimize adverse impacts but they must be reasonable, practicable and under the control of the permittee.
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> However, once the decision is made to allow the construction then it must be realized that the decision has also been concurrently made (whether intentional or unintentional) to accept whatever conditions that result from the permitted activity, providing they are the natural consequence of impounding water and not due to point source discharges of pollutants (including thermal discharges).

This basically means that no temperature limitations that would apply to the impounded water should be placed in a permit that authorizes or allows the construction of an impoundment or pond. However, the potential for increased temperature in both the impoundment or pond and the downstream area is a valid concern and should be considered in the decision regarding the **issuance** of a permit to authorize or allow construction. Practicable requirements to avoid or minimize such impacts may be placed in the permit.

Implementation - Ponds:

In general, DEQ approves of and is supportive of the construction of ponds in ephemeral waterways that serve as storm water BMPs and, in general, ephemeral waterways are considered suitable sites for the placement of ponds..

The temperature that occurs in a pond is generally of little or no concern due to the small volumes that are usual in such structures, the widely fluctuating water levels and the lack of direct and/or continuous hydraulic connection to permanent or intermittent streams.

Temperature limitations should not be included in permits that authorize or allow the construction of ponds. However, considerations similar to those for impoundments, as discussed above, would apply regarding the decision for issuance of a permit to construct a pond, including possible downstream impacts.

Implementation of 9 VAC 25-260-80:

This standard specifically discusses thermal restrictions on point sources that discharge to impoundments. This will not impact a VWP permit that is issued to allow the construction of an impoundment and, as discussed above, temperature limitations are not appropriate in that permit. However, this standard will require that the thermal condition of the impoundment be analyzed and documented in the event that a VPDES permit is issued that allows a thermal discharge to an impoundment. Temperature limits placed in a VPDES permit that authorizes a point source discharge to an impoundment should be based on the temperature of the impoundment after construction and after it has attained thermal stability. VPDES permit limits to control the temperature in an impoundment or pond should not be based on the temperature of the feeder streams.

Note that cooling ponds that are constructed specifically for cooling an effluent prior to discharge are considered as part of the treatment facility and are not subject to the water quality standards. Such cooling basins/ponds/impoundments should not be allowed to be constructed in the channel of any waterway unless specifically authorized by a VPDES permit and, perhaps, a 316(a) variance as approved by the Board .

General guidance for siting storm water management BMPs in surface waters including wetlands:

A watershed approach should be encouraged in lieu of isolated management efforts, particularly when being applied to urban watersheds. A rule of thumb for identifying an urban watershed or stream is one that contains 20% or greater impervious area. A watershed approach has the following benefits:

- More effective flood control for the entire stream corridor.
- Opportunities are greater for the installation of water quality controls in watersheds developed with no controls.
- Protection of undeveloped stream and wetland resources are enhanced.
- Restoration, retrofit and mitigation opportunities are greater.
- It results in fewer facilities to operate and maintain.

Exceptions:

There are several situations where the conditions that will result from the construction of an impoundment or pond may result in unacceptable thermal or environmental impacts on the aquatic environment and such projects should not be issued a permit. These include impoundments (and may include ponds) that are proposed in or that will adversely impact downstream:

- Class V put and take trout streams.
- Class VI natural trout streams.
- Any waters containing rare or endangered species.
- All waters designated by the board as antidegradation tier III waters.

In addition to these exceptions, care should be taken to assess the cumulative impact of multiple impoundments or ponds within a watershed. While the conditions that result from each individual impoundment may be found acceptable the cumulative impact may not be.

Disclaimer:

This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, It does not mandate any particular method nor does it prohibit any particular method for the analysis of data, establishment of a wasteload allocation, or establishment of a permit limit. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.

If you have any questions regarding this guidance please feel free to contact Dale Phillips or Ellen Galinsky.