

Technical Addendum #1, Mixing Zones for Discharges to Streams ½ Mile or Less from a Lake
Guidance of Water Quality and Antidegradation Review Assistance

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The regulations at 10 CSR 20-7.015 (1) (A) 2. indicate that a discharge to a stream that is ½ mile or less (measured at normal pool) from a lake is considered a lake discharge. In 10 CSR 20-7.015(3), the Water Protection Program assigns the same numeric effluent limits for BOD₅ and TSS to discharges that are ½ mile or less from a lake and to direct discharges to lakes. This regulation was created in recognition of the need to protect water quality in lakes and the application of this regulation helps achieve this goal. The regulation does not imply that water quality based effluent limitations be developed with mixing zones for discharges to a stream that are ½ mile or less from a lake.

A mixing zone is applied to direct discharges to a lake as defined in 10 CSR 20- 7.031 (4) (A) 4.B IV. For streams with a 7Q10 less than 0.1 cfs, a mixing zone and a zone of initial dilution is not assigned; therefore, if the flow in the receiving stream for discharges that are ½ mile or less from a lake is less than 0.1 cfs, no mixing zone is applied.

Application to Permitting and Water Quality Based Effluent Limitations:

- 1) For discharges to streams less than ½ mile from a lake, the stream should be listed as first receiving waterbody (unclassified or classified), and the lake as the second receiving and classified water body. The effluent regulations consider these discharges that are ½ mile or less from a lake as discharges to streams; therefore, we need to list the stream to which the discharge is actually being placed in the permit or water quality review.
- 2) For discharges to streams greater than or less than ½ mile from a lake with stream flow less than 0.1 cfs, no mixing will be allowed for the development of water quality based effluent limits; however, for discharges to streams ½ mile or less from a lake, numeric effluent limits for BOD₅ and TSS will be applied as specified in 10 CSR 20-7.015(3).
- 3) Lake discharges receive mixing zone determinations and water quality based effluent limitation that will be developed with the mixing zone flow volume as described in Part 2, Reference B (page 28) of the WQAR Guidance. In addition, water quality based effluent limitations for ammonia may be developed in the manner described below:

Summer

Note: Because the chronic long-term average (LTA) ammonia limit will be less stringent than the acute long-term average ammonia limit, no determination for the chronic LTA was completed.

Acute WLA: $C_c = 12.1 \text{ mg/L}$
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]
MDL = 3.9 mg/L (3.11) = 12.1 mg/L [CV = 0.6, 99th Percentile]
AML = 3.9 mg/L (1.19) = 4.6 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Acute WLA: $C_c = 12.1 \text{ mg/L}$
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]
MDL = 3.9 mg/L (3.11) = 12.1 mg/L [CV = 0.6, 99th Percentile]
AML = 3.9 mg/L (1.19) = 4.6 mg/L [CV = 0.6, 95th Percentile, n = 30]



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Below is a list and brief description of revisions:

Version	Date Completed	Description
Version 1.0	September 7, 2012	Original version written by Todd Blanc.