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## 6.0 MARGIN OF SAFETY

A TMDL is less than or equivalent to the loading capacity after taking into account the allocations for all sources and a margin of safety (MOS). A TMDL can be divided into a wasteload allocation (WLA) for point sources subject to an NPDES permit, and a load allocation (LA) for all other sources including nonpoint and natural background. The TMDL is represented by the following equation:

$$\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}.$$

TMDLs are required to include an MOS that accounts for variability in the data, uncertainty in the point and nonpoint source load estimates, and limitations in the accuracy of the modeling analysis. The MOS can be expressed either implicitly or explicitly. An implicit MOS is incorporated by making conservative assumptions in the TMDL analysis, such as allocating a conservative load to background sources. An explicit MOS is applied by reserving a portion of the TMDL and not allocating it to any other sources.

For these nutrient TMDLs, the margin of safety was developed using a combination of conservative assumptions and explicit recognition of potential errors in flow calculations. Therefore, this margin of safety is the sum of the following two elements:

- *Conservative Assumptions*

Treating phosphorus and nitrogen as conservative pollutants, that is a pollutant that does not readily degrade in the environment, was used as a conservative assumption in developing these loading limits.

Using the 4-day, 3-year (4Q3) critical low flow to calculate the allowable load.

Using the proposed treatment plant design capacity (200,000 gallons per day) for calculating the point source loading when, under most conditions, the treatment plant will not be operating at this projected capacity.

A more conservative limit of the geometric mean value, rather than the current and proposed standards which allow for higher concentrations in individual grab samples, was used to calculate loading values.

- *Errors in calculating flow*

4Q3 low flow values were determined based on USGS gaging data. There is inherent error in all flow measurements. A conservative, explicit MOS for this element is 5 percent.