

TMDLs in Plain English

Abbreviations are handy. All of us – scientists, regulators, even shoe salesmen – use them because they save time. To the layman, however, these unpronounceable strings of letters often look more or less like alphabet soup.

Pollution control has its share of abbreviations. The abbreviation *TMDL*, which stands for *total maximum daily load*, is a good case in point.

The phrase is somewhat confusing. For starters, it sounds like it has more to do with trucking than water pollution control. Plus, although *daily* is part of the phrase, the *load* isn't necessarily daily. *Daily* once fit it nicely, but things have changed. Lastly, the abbreviation covers more than just a load. Regulators often use it to describe a plan to reduce water pollution, too.

Some of the confusion is because TMDL initially addressed mainly point source pollution. That type of pollution comes from an easily identified source – a *point* – such as wastewater treatment plants, factories, refineries, etc. At such places, it is possible to assign acceptable, maximum daily loads for the source's pollutants. That is, one can determine how much of a pollutant a given body of water can receive and still support *beneficial uses*. Such uses include aquatic life, fisheries, drinking water, recreation, etc.

Like all states, Virginia is required by the federal Clean Water Act to inventory its waterways and their health. This inventory is called a *303(d) list*. Each waterway is characterized in the list as *fully supporting*, *impaired* or *threatened*.

What about nonpoint source pollution?

TMDL fit point source pollution control well because point sources are relatively easy to find. Their discharge is likewise relatively easy to control. The fit, however, is not as neat for *nonpoint* source pollution. This is because nonpoint source pollution enters waterways mainly when it rains. Storm water runoff leaves farms, construction sites, parking lots, roads, etc., and pollution is carried in that runoff. Because this type of pollution comes from vast, varied and diffuse sources, and because rain doesn't abide by the clock, it's harder to tackle.

Even so, the TMDL process provides a logical framework in which an *implementation plan* (IP) that addresses both types of water pollution can be written. Water quality targets and strategies to attain those targets are spelled out in such plans.

The watershed connection

The abbreviation TMDL has been around for years, so why is it suddenly so important? It's because these plans generally cover a watershed, which, put simply, is the land that drains into a given waterway or segment thereof. Luckily for us, one of America's biggest watersheds is the Chesapeake Bay's, and about three-fifths of Virginia drains into the bay. Despite decades of work, it's still unhealthy so the EPA decided to increase pressure on states with land that drains into the bay. EPA expects bay states to write and implement clean-up plans, using the TMDL approach. It's unclear what will happen if the states don't meet EPA's expectations, but the states suppose it would be unpleasant. It could involve funding cuts.

EPA says the bay has 92 "segments." Each segment has its watershed, and EPA expects each one to have an implementation plan, too. Thirty-five of the 92 segments are in Virginia, so there will be 35 TMDL IPs here.

The 35 plans will be merged into a master document for Virginia. Other bay states – Maryland, Pennsylvania, etc., and the District of Columbia – also will have master WIP documents.

Lightening the load

In terms of TMDL, the word *load* refers to how much of a given pollutant that a waterway can tolerate without violating water quality standards. It's also called a *load cap*. The difference between what's actually entering the waterway and what's allowed is called a *load reduction*. They can be expressed in pounds, as is the case for phosphorus, or in tons, as is the case for sediment. Although EPA has given bay states preliminary load figures – that is, pollutant reduction loads – those figures will probably change.

EPA derived the numbers by using modeling software that predicts how the bay and its tributaries would respond if people acted to reduce pollution... if they lightened the load, so to say. For example, let's say a farmer puts up a fence to keep cattle away from a certain creek. This would keep some nitrogen, phosphorus and sediment out of the creek. In turn, that would make life in the waterway more diverse, plentiful and healthy. And that, after all, is what the TMDL process is all about. The modeling software enables officials predict which measures would work best and where they should go.

Why are load figures likely to change? It's because the computer model the EPA uses to set the goals is being improved. In any case, the states needed something to work with, hence EPA's "interim" load figures. They're imperfect, but it's a starting point.

Revisiting childhood

Think about when you were a kid watching letters swirl around in you alphabet soup. Every now and then they'd line up to spell something meaningful, such as "cat" or "foot" or "hippo." Now that you've read this, you can add "TMDL" to the list of acceptable words.