WET Testing

Whole Effluent Toxicity (WET) testing methods can be acute, which is based on lethality during short-term exposure, or chronic, which is based on lethality or sublethal effects (growth or reproduction) during longer-term exposure. WET testing subjects aquatic organisms to different concentrations of an effluent and measures the response of the organisms to estimate toxicity. The Water Quality Control Division (WQCD) has begun to implement sublethal Whole Effluent Toxicity (WET) requirements into Colorado Discharge Permit System (CDPS) permits.

USEPA has been promoting Whole Effluent Toxicity Testing (WET) as a means for measuring toxicity to aquatic life. While WET is a valid tool for assessing potential toxicity of water, it is also important to recognize the limitations of the test method. For example:

- Variability in WET testing analytical methods can lead to false positive results (EPA 2000).
- Confounding factors involved in WET testing such as, ionic interferences, inability to simulate field conditions in the laboratory, selection of representative test species, and episodic flow characteristics, can give misleading indications of potential toxicity. Small variations in the ionic balance of test water can affect the reproductive cycle of some species used in WET testing. Chapman (2000) expands upon numerous examples of these types of issues.
- Choice of representative test organisms can be an issue as well. For instance, Ceriodaphnia dubia can be adversely affected by suspended solids and generally does not inhabit flowing waters.
- Lastly, many mining facilities only discharge episodically, in which case the basis for chronic testing may no longer be applicable. The length of chronic tests varies but can be up to 9 days, which is not accurately represented by a short-term episodic discharge.

All of the preceding issues are even more problematic and results can be more misleading when testing for sublethal effects. Because sublethal effects are not as definitive as lethal effects, sublethal testing methods are even more sensitive to the above issues.

Sublethal effects testing at some facilities has shown issues with the overall TDS of the water, which can be confirmed with more detailed toxicity identification evaluations (TIE). TIEs are extremely involved and expensive undertakings and industry should not be expected to pursue these where TDS is the expected cause of toxicity.

A primary issue that facilities are encountering is that when sublethal effects are caused by ionic imbalance (TDS), the TIE process is not straightforward. Ionic imbalance is shown by proving that none of the other pollutants (e.g. metals, organics, etc.) are causing the toxicity. Even when this is done however, there is no clear path for a facility to take to avoid recurring TIE studies in the future. WQCD should allow off-ramps from WET sublethal requirements where failures are shown to be caused by TDS

/ ionic imbalance. The WQCD should also consider development and approval of alternative test species.

The number of stakeholders being affected by the sublethal testing requirements is increasing creating more impetus to address this issue. CMA suggests that WQCD address the issue through a Division-led workgroup intended to update WET regulation and guidance.