

ITEM: 11

SUBJECT: Monitoring and Data Collection Needs and Challenges for Pyrethroid Pesticides related to the Central Valley Pyrethroid Pesticides TMDL and Basin Plan Amendment

BOARD ACTION: Information Item

BACKGROUND: Pyrethroid pesticides are widely used and have been identified as pollutants that are impairing waterbodies in the Central Valley in both urban and agricultural areas, and are a pollutant of concern in the Delta. At very low levels, pyrethroids can cause lethal and sublethal effects to aquatic invertebrates and fish and reduce available prey species for fish. Staff is developing a proposed amendment to the Basin Plan to establish a control program for pyrethroid pesticides to address these potential impacts. Due to data gaps and uncertainties, the proposed amendment being developed would utilize a phased approach that provides for data collection to inform future Board actions to refine the control program. There are several challenges with monitoring for pyrethroids and related toxicity that need to be acknowledged and addressed to the extent possible.

In this Item, staff and other technical experts will discuss:

- 1) Data needs related to pyrethroid pesticides,
- 2) Challenges in filling those data needs, and
- 3) Potential ways to move forward in filling those data needs.

Pyrethroids have been detected in sediments and identified as the cause of sediment toxicity to the test organism *Hyalella azteca* in many urban and agricultural water bodies throughout the Region. *Hyalella azteca* is an aquatic invertebrate that is the test organism known to be most sensitive to pyrethroids. Pyrethroids can also cause toxicity in the water column. Currently, there is little water column pyrethroid data being collected by the Central Valley Water Board's water quality programs, particularly paired sampling of both pyrethroids chemistry and toxicity with *Hyalella azteca*. The Delta Regional Monitoring Program collects chemical analysis data for pyrethroids in the water column, but thus far has not been monitoring for toxicity to *Hyalella azteca*.

Because little pyrethroid water column data has been collected in surface waters or discharges in the watershed, the extent and degree of the presence and levels of pyrethroids is not well characterized. Assessment of water column pyrethroid concentrations and toxicity will be needed to determine the extent of reductions needed, assess whether beneficial uses are protected, and to track progress.

Toxicity testing is a valuable tool that can provide an indication of the potential of single or multiple pollutants to affect aquatic life; even if the constituents are not measured or detected by analytical chemistry. Toxicity testing is also a direct measurement of the bioavailability of pollutants. The combination of both chemical analysis and toxicity test data provides a powerful data set that can indicate what levels of pyrethroids in surface waters are or are not toxic.

For chemical analysis monitoring, commercial laboratory reporting limits are not

as low as the levels of concern for pyrethroid pesticides. However, pyrethroids are frequently detected above the available reporting limits and pyrethroid chemistry data may be used to provide valuable information about areas where pyrethroids may be above levels of concern.

Hyalella species are listed as a supplemental species in the USEPA water column toxicity test method, but a specific test protocol is not given for this species. Because of the lack of standardization for the water column test protocol, several studies have shown that this test has relatively high interlaboratory variability. A recent interlaboratory calibration study for the water column *Hyalella azteca* toxicity test and others was coordinated by the Southern California Coastal Water Research Project (SCCWRP) with a focus on stormwater testing. A representative from SCCWRP will present the preliminary results of this study.

There are several alternatives for attaining pyrethroids and *Hyalella* water column data, including 13267 orders, permit requirements, and working through groups such as the Regional Monitoring Program. Because of the technical challenges discussed above, collaborative approaches could help support representative monitoring at a scale that will result in the most useful data, as compared to individual dischargers monitoring. Data collection efforts would also benefit from coordination with ongoing monitoring by the Department of Pesticide Regulation and the Surface Water Ambient Monitoring Program SWAMP, and from efforts to standardize protocols so data are as accurate and comparable as possible.

ISSUES

1. The Board will need water column pyrethroid and toxicity data to implement an appropriate phased control program for pyrethroids.
2. Monitoring for pyrethroids and/or toxicity to *Hyalella azteca* is likely to be a significant expense, so it is essential that data be collected in ways that make the results as useful as is possible.
3. Current analytical chemistry reporting limits for pyrethroids are not as low as the levels of concern, making it difficult to know if beneficial uses are protected by chemical concentrations alone.
4. Water column toxicity testing with *Hyalella azteca* is a sensitive indicator for pyrethroid toxicity and a direct measurement of bioavailability. However, some studies have shown that water column toxicity test results with *Hyalella azteca* can vary among laboratories and are not always highly reproducible.