

ITEM: 18

SUBJECT: Cyanide – Non-Representative Laboratory Analysis Results

BOARD ACTION: Informational Item

BACKGROUND: Cyanide is a compound consisting of carbon and nitrogen that is formed from both natural and human sources. It is toxic to humans and aquatic life. Aquatic life criteria for cyanide are included in the California Toxic Rule and human health standards for cyanide are set forth by the Department of Public Health; therefore cyanide is commonly monitored for in wastewater discharges. Studies conducted in the Central Valley show that the required sample preservation technique (addition of sodium hydroxide to pH \geq 12) may cause false positive test results in which reported concentrations of cyanide are higher in preserved samples than in unpreserved samples. These false positive test results may then result in the development of cyanide effluent limitations when there may actually not be reasonable potential for cyanide to exceed water quality standards. Effluent cyanide levels may then also exceed the effluent limits based on false positives that are not representative of the actual quality of the sample, resulting in enforcement (including MMPs). USEPA allows for an alternative test procedure (ATP) which requires a detailed USEPA-approved holding time study. Attached is a White Paper that was circulated to interested parties and comment, and a technical memo prepared by municipal dischargers describing technical studies on the issue.

Based upon the White Paper, technical memos, responses received, and other research, Board staff has developed the following conclusions:

- 1) Cyanide can be present in wastewater discharges in excessive concentrations that may impact both aquatic life and human health. Therefore cyanide analyses cannot simply be discounted.
- 2) False positives are an identified problem for cyanide analyses. However, without the ATP hold time studies that are part of the current USEPA requirements, there is not a high level of confidence in the analytical results because of the known interferences of the preservative in wastewater effluent.
- 3) The cyanide analyses are being conducted by laboratories using EPA approved methodologies as listed in Federal Register Part 40 CFR 136. The established protocol requires sample preservation if the analysis cannot be started within 15 minutes of sample collection. Most facilities can not start analysis of a sample within 15 minutes and must add the sample preservation agent. Chemical interaction between the cyanide and the preservative results in higher reported concentrations than measured in the unpreserved samples.

- 4) Under NPDES regulations, a Regional Board cannot allow use of an unapproved lab procedure, even if one was available. 40 CFR 136 allows USEPA to approve an ATP to determine the appropriate holding time prior to addition of the preservative. This process must be conducted for each wastewater treatment plant, but is beyond the available resources of most dischargers.
- 5) Modifications to the cyanide preservation protocols are in progress at the national level. Under the proposed changes to 40 CFR 136, dischargers that perform holding time studies will be able to submit unpreserved sample test results consistent with their holding time study results. As the body of evidence grows with each holding time study, the Central Valley Board may be able to use its discretion with other dischargers who have not performed site-specific holding time studies. For example, a discharger could submit both preserved and unpreserved sample results (unpreserved holding times consistent with the body of evidence) and the Regional Board could use its discretion to rely on data from the unpreserved samples for reasonable potential analysis and compliance determination, and/or enforcement determinations (Mandatory Minimum Penalty or other Administrative Civil Liability).

RECOMMENDATION: Resolution of this matter is not within the authority of the Central Valley Water Board at this time. Until new USEPA cyanide analysis procedures are in place, Board staff will continue to evaluate the quality and reliability of cyanide data and make recommendations on whether or not the data is representative of the wastewater and should be used in permitting and enforcement actions.

Mgmt. Review _____
Legal Review _____

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