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NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 1993.10

August 25, 1993

To: Assistant Chief Hydrologist, PC&TS
Regional Hydrologists
Chief, Office of Water Quality
Assistant Chief, Office of Water Quality
Deputy ACH for PC&TS for NAWQA
Area Hydrologists
District Chiefs
Regional Water-Quality Specialists
Assistant Regional Hydrologists for NAWQA
District Water-Quality Specialists
Chiefs, NAWQA Study-Units
Chief, Ocala Project Office
Chief, Yucca Mtn. QE Group
Chief, Branch of Quality Assurance
Employees, National Water Quality Laboratory

From: Chief, National Water Quality Laboratory
Branch of Analytical Services

Subject: Interferences in the Methylene Blue Active Substances [MBAS] Method, Techniques of Water-Resources Investigation [TWRI], [0-311-83], Book 5, Chapter A3.

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Revision: No

SCOPE

The National Water Quality Laboratory (NWQL) investigated the interference of nitrate on the TWRI method for the determination of MBAS. This investigation was conducted in response to questions arising from the results of district-submitted QC samples spiked with various concentrations of nitrate but no other MBAS. These results indicated a positive response by nitrate on the MBAS method.

The NWQL ran a series of tests to quantify the positive interference observed in the district samples. The data from these experiments did confirm that there is a positive interference by both nitrate and

chloride on MBAS measurements. As a result, the NWQL has taken steps to verify a replacement method.

The NWQL is currently validating a method for the analysis of MBAS that will eliminate the false positive interference by nitrate and chloride. The new method is based on the MBAS method described in Standard Methods for the Analysis of Water and Waste Water, Seventeenth Edition. The main difference between the current TWRI method and the proposed method is a wash step to remove nitrates and chlorides from the extraction solvent. An OFR is being generated detailing the results of the method validation as well as the correction equations that may be used to correct (data from 1970 to August 30, 1993) previous MBAS results. The correction equations, expected to be released on QWTALK by September 20, 1993, will be usable when districts have nitrate and chloride data for the MBAS samples. If nitrate and chloride data are not available, correction of previous data is not possible.

The observed correlation between MBAS and nitrate that has been reported recently may be due to the positive nitrate response in the TWRI MBAS method. Data interpretation using the TWRI MBAS method should be done using nitrate- and chloride-corrected MBAS data and the new detection limit.

The use of the correction factors will impact previous MBAS data in two ways: 1) the corrected MBAS data will be lower due to the TWRI MBAS method giving false positive data, and 2) the detection limit for the new method is 0.025 mg/L which is 2.5 times higher than the stated TWRI MBAS detection limit.

All samples received after August 30, 1993, will have MBAS determinations done by the new method. The NWQL will also require that all subsequent MBAS samples be taken in 500-mL polyethylene bottles due to the larger sample aliquot (400 mL) needed for the new method. If you have further questions, please contact Mark Burkhardt or Jeff Pritt.

/signed/

Peter F. Rogerson

Supersedes: None

Keywords: MBAS, nitrate interference, chloride interference

Distribution: See above plus QWTALK