United States Department of the Interior

U.S. GEOLOGICAL SURVEY
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IN REPLY REFER TO:

NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 1995.01

October 14, 1994

To: Assistant Chief Hydrologist for 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 Mountain HIP
QA Manager, Yucca Mountain Project
Chief, Branch of Quality Assurance
Employees, National Water Quality Laboratory

From: Peter F. Rogerson, Chief
National Water Quality Laboratory
Branch of Analytical Services

Subject: National Water Quality Laboratory Alkalinity Reanalysis Policy

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Revision: None

SCOPE

This memorandum presents a new policy statement for reanalysis of alkalinity in water samples. Because alkalinity is not a stable constituent, alkalinity measurement in the field are more accurate than alkalinity measurements in the laboratory. Therefore, the National Water Quality Laboratory (NWQL) will no longer perform routine reanalysis of alkalinity.

NWQL alkalinity methods are I-2030-85 and I-2034-86 (Fishman, 1993, p. 9-12; Fishman and Friedman, 1989, p. 55-58, respectively). The lab codes and test ID's for methods I-2030-85 and I-2034-86 are lab codes 0070 and 1270 and test ID's 90410A and 90410B. As described in the method documents, alkalinity is susceptible to substantial change between time of collection and time of laboratory analysis. These changes are more rapid once the sample bottle is opened. The alkalinity of some samples may change appreciably within hours. Therefore, alkalinity should be determined as an on-site parameter at the time of sampling for the greatest accuracy. In addition, the U.S. Environmental Protection Agency (1992) states that environmental alkalinity measurements require immediate analysis. This indicates laboratory measurements of alkalinity may not accurately represent the alkalinity at the time of collection. Based on the sources, laboratory alkalinity values should be used only as qualitative checks or as determinations of sample stability during transit. The laboratory alkalinity should be published only as a last resort (R.J. Pickering, U.S. Geological Survey, written communication, Quality of Water Branch Technical Memorandum No. 82.06, 1982).

The alkalinity of natural-water samples can change with time and with handling due to various environmental factors and chemical reactions. Several days typically elapse between sample collection and a NWQL alkalinity determination, and additional time and handling will transpire before a reanalysis is performed. Therefore, unless a gross error is suspected in the initial laboratory determination, it is seldom advisable to check the result through reanalysis.

Because alkalinity is not a stable constituent and field alkalinity values are the more accurate, the NWQL will no longer routinely offer alkalinity reanalysis. For those instances where a customer believes that an alkalinity reanalysis is still appropriate, the NWQL will perform the reanalysis and bill the customer for the service.

The NWQL requests that field alkalinity values still be provided to the laboratory for the purpose of computing cation-anion balances and specific conductance:milliequivalent anion sum ratios.

Discussion and Conclusions: Requests for alkalinity reanalysis will be performed as requested, but the customer will be billed for the determination. This policy is based upon the instability of alkalinity in many water types.

References Cited:

Fishman, M.J., ed., 1993, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of inorganic and organic constituents in water and fluvial sediments: U.S. Geological Survey Open-File Report 93-125, 217 p.

Fishman, M.J., and Friedman, L.C., eds., 1989, Methods for determination of inorganic substances in water and fluvial sediments (3d ed.): U.S. Geological Survey Techniques of Water-Resources Investigations, book 5, chap. A1, 545 p.

U.S. Environmental Protection Agency, 1992, Protection of environment--Guidelines establishing test procedures for the analysis of pollutants: U.S. Code of Federal Regulations, Title 40, Part 136, July 1, 1992, p. 321.

Supersedes: None
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