United States Department of the Interior

U.S. GEOLOGICAL SURVEY
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IN REPLY REFER TO:

NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 1994.01

October 18, 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: Discontinuance of analysis of unfiltered (raw) water samples for radionuclides by the National Water Quality Laboratory (NWQL) Discontinuance of analysis of unfiltered, acidified samples for total uranium

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Revision: No

SCOPE

DISCONTINUANCE OF ANALYSIS OF UNFILTERED (RAW) WATER SAMPLES FOR RADIONUCLIDES BY THE NATIONAL WATER QUALITY LABORATORY (NWQL)

Effective November 1, 1993, the NWQL will no longer accept unfiltered (raw) samples for radionuclide analysis. Field filtration for suspended sediment and dissolved water samples will be required. District personnel are asked to review their present projects and change their requests accordingly.

Since the 1970's, the NWQL has been accepting raw, unacidified samples for analysis of suspended and dissolved gross alpha, gross beta, and gamma and for the analysis of dissolved specific radionuclides. In 1989 this work was expanded to include analysis of suspended radionuclides such as radium-226, radium-228, thorium-230, and thorium-232.

Because it was known that some radionuclides in raw, unacidified samples have a tendency to fall out of solution and adhere to the suspended material or to the inner wall of the container, the NWQL in 1991 stopped accepting raw, unacidified samples for analysis of dissolved specific radionuclides.

The NWQL wanted to extend this policy to include field filtration for all analyses for radioactivity which would then include gross alpha, gross beta, and gamma. This proposal was presented to the NWQL Radiological Advisory Committee at the April 1993 meeting. The proposal was accepted and the committee recommended the change.

Beginning November 1, 1993:

Schedule 606 Suspended and Dissolved Alpha & Beta will be discontinued. It will be replaced by Schedule 456 Dissolved Alpha & Beta and Schedule 165 Suspended Alpha & Beta.

Schedule 609 Suspended & Dissolved Alpha & Beta High Dissolved Solids will be discontinued. It will be replaced by Schedule 458 Dissolved Alpha & Beta High Dissolved Solids and Schedule 165 Suspended Alpha & Beta.

Schedules 456 and 458 each require 2 liters of FAR (filtered, acidified sample). Schedule 165 requires the suspended material to be submitted on a 47-mm, 0.45-um filter paper. The filter paper is to be sent in a petri dish with the sides taped and the tare weight of the filter paper written on top of the petri dish. The weight is not to exceed 70 mg.

Lab Code 211 Gamma, Suspended in pCi/L, lab-filtered sample will be discontinued. It will be replaced by Lab Code 1861 Gamma, Suspended, in pCi/gm, field-filtered sample. This sample is to be submitted on 47-mm, 0.45-um filter paper sent in a petri dish with the sides taped and the tare weight of the filter paper written on top of the petri dish. Please filter as much water as possible in a reasonable amount of time. There is no maximum weight for the gamma suspended sample.

Our contract lab is presently using Kontes 953200-4704 47-mm, 0.45-um filter paper for both alpha/beta suspended and gamma suspended.

When these changes are made November 1, 1993, ALL SUSPENDED GROSS ALPHA, GROSS BETA, AND GAMMA results will be reported in pCi/gm. This can make significant changes in the values reported.

Example.- If 1 liter of water contained 50 mg of suspended material, a gross alpha activity of 10 pCi/L would be 200 pCi/gm.

Also, when these changes are made, the results for field-filtered dissolved gross alpha and gross beta may show a bias in comparison with previous results for lab-filtered gross alpha and gross beta. In most instances, these new results will be biased high (in reality, it was the previous results that were biased low) since nuclides tended to fall out of solution before the sample were filtered in the lab.

DISCONTINUANCE OF ANALYSIS OF UNFILTERED, ACIDIFIED SAMPLES FOR TOTAL URANIUM

Analysis of unfiltered, acidified samples for uranium has been offered by the NWQL as Lab Code 1365. This procedure is being discontinued because the replicate analyses produce poor agreement and the usefulness of this analysis has limited applicability in evaluating uranium in environmental samples.

If only dissolved uranium is required, Lab Code 1006 can be requested. This is the same method (fluorometry) as Lab Code 1365 but requires a field-filtered acidified sample and no digestion in the procedure. If both suspended and dissolved uranium are required, Schedules 1130 isotopic uranium, dissolved, and 1137 isotopic uranium, suspended, should be requested. The NWQL will offer analysis of suspended material for total uranium by fluorometry in the future. This is not available at this time.

These changes will become effective November 1, 1993.

/signed/

Peter F. Rogerson

Supersedes: None

Key Words: Radionuclides, fluorometry, alpha, beta, gamma, isotopic

Distribution: See above plus QWTALK