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Mr. James A. Saric, Remedial Project Manager
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Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

DOE-0726-02

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

RECOMMENDATION TO DISCONTINUE REAL-TIME FIELD QUALITY CONTROL SYSTEM MEASUREMENTS

The quality program for the Real-Time Instrument Measurement Program (RTIMP) was designed to emulate practices performed in an analytical laboratory. Consequently, the daily High Purity Germanium Detector (HPGe) measurement at the RTIMP Field Quality Control Station (FQCS) was instituted to be analogous to a Laboratory Control Standard (LCS). In the draft Multi-Agency Review Laboratory Analytical Protocol (MARLAP) document, the LCS is defined as "a QC sample of known composition or an artificial sample, created by fortifying a clean material similar in nature to the environmental sample." The LCS is prepared and analyzed in the same manner as the environmental sample." The value of the LCS is that it is subjected to the same preparation and analytical processes as actual samples to provide an indicator of analytical or instrument problems that may occur in any stage of the analysis.

The LCS is a valuable QC check for analyses that require extensive processing such as chemical separation, precipitation, sample concentration, or leaching, as long as the LCS can be taken through all of the process steps. However, for some analytical procedures (e.g., gamma spectroscopy), the LCS does not add value because it is a redundant measurement and less effective than others. In gamma spectrometry analysis the sample is not processed, but simply poured into the appropriate counting container (i.e., counting geometry). For such an analysis, the LCS could be used as an indicator for a number of

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instrument parameters that must be monitored, but the LCS is not the most effective indicator that can be used. The QC programs for gamma spectrometry typically include the use of background measurements and instrument check sources to monitor detector efficiency, energy calibration, resolution, and detector background. When there is no destructive sample processing involved, those are the only parameters monitored with LCS measurements, so using a LCS in addition to instrument checks adds no value. The instrument checks are more effective monitors of measurement quality because the daily checks produce a separate value for each parameter, while the LCS provides only a single value representing all four parameters. Consequently, the instrument checks provide more timely information about individual detectors.

The FEMP RTIMP performs *in situ* gamma spectrometry measurements for which there is no sample preparation. Every detector taken into the field receives the instrument checks noted above prior to use, and a measurement at the FQCS provides no additional information on the performance of the detectors. Acceptance criteria for the measurements have been established for the daily instrument checks (e.g., energy calibration), and not the LCS measurement.

Another stated purpose of the FQCS measurements was to alert real-time personnel to the presence of elevated radon levels near the ground surface. However, deployment of radon monitors is required whenever radium-226 measurements are to be reported, for example during precertification activities. So, on this score also, the FQCS measurement is redundant and less effective than other measurements that will be performed. Moreover, the FQCS pad is covered and does not receive precipitation, making it a poor analog for tracking the effect of moisture variation on field measurements. The pad must remain covered when it is not in use to avoid the collection of water in the sample slots, as the clay subsurface drains poorly and the uranium, thorium, and radium sources cannot be placed in slots with standing water.

Considering that the FQCS measurement does not (1) add to the reliability of the measurements, (2) mimic field conditions, and (3) improve measurement quality, it is recommended that it be eliminated as a requirement for real-time HPGe measurements. Eliminating the measurement will also provide the added benefits of eliminating the moisture measurement with the Troxler and increasing the work efficiency of the real-time personnel. The Troxler instrument uses a Cs-137 source that is the strongest source of gamma radiation within the real-time buildings. There is a strong desire to eliminate this source per the request of the site radiological control manager. Continued use of this instrument will require reconfiguration of source storage and additional time and resources to control access to the building housing the sources. Eliminating the FQCS measurement will eliminate the need for the Troxler and the estimated savings in daily labor required to perform the FQCS and Troxler measurement is 1.5 hrs/day. Therefore, eliminating the measurement is in line with As Low As Reasonably Achieved (ALARA) principles and increasing the productivity of the real-time group.

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If you have any questions, please contact me at (513) 648-3124,

Sincerely,



Johnny W. Reising
Fernald Remedial Action
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