

## UPDATE OF ROUTINE URANIUM BIOASSAY ANALYSIS BY ID-ICP-MS ~CONSIDERATION OF SAMPLE SIZE, ETC.

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In 2012, the Radiobioassay Program at the Oak Ridge National Laboratory has developed an improved analytical method to lower the detection limit for  $^{235}\text{U}$  in urine samples. The new procedure not only lowers the detection limit, but also allows precise determination of isotopic ratio of uranium 235/238. That may eliminate the requirement of alpha spectrometry analysis of U-234 to calculate the isotopic ratio.

As the analyses with the new procedure continues, a few questions have come up, such as why 50 g sample size?, should the QC activity level be lower?, or why the laboratory reagent blank changes from time to time? Also, an ergonomic issue has been identified as technicians repeatedly use an adjustable pipette to take representative subsamples. To answer those questions and the issue, investigations on sample sizes, different QC activity levels, and possible source of uranium contamination in blanks have been performed to improve the quality of our routine procedure.

The improved procedure now uses 25 g of sample, which reduces the ergonomic issue, two different levels of QC levels to cover low level samples. Also, a few uranium contamination sources have been identified.

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