

RAPID TURN AROUND TIME MEASUREMENTS ON EMERGENCY SAMPLES AT WASTE ISOLATION PILOT PLANT (WIPP) LABORATORIES

ABSTRACT

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The Waste Isolation Pilot Plant Laboratories has participated in the NRIP Emergency Response program administered by the National Institute for Standards and Technology (NIST) since 2004. A rapid column separation method using vacuum box and stacked Eichrom resin columns (TEVA+TRU+SR-Resins) to separate the actinides including U, Pu, Am, NP isotopes and ⁹⁰Sr was applied directly to the NRIP 2015 emergency urine and fecal samples. With minimal sample preparation, the turn around time (TAT) of 8 hours or less for all non- destructive and destructive measurements was achieved during this exercise. Acid leaching process for fecal samples was applied prior to splitting samples for gamma and column separation. Calcium phosphate precipitation was used to pre concentrate actinides and ⁹⁰Sr in NRIP 2015 urine. The samples were loaded to stacked columns after the oxidation states were adjusted. The columns were then de stacked and processed separately by a different analyst. This assembly line improvement reduced sample preparation time for the NRIP 2015 emergency urine and fecal analyses significantly. This assembly line approach works very well for all type of emergency response samples (including any Homeland Security Incident, RDD, Dirty Bomb, Nuclear Forensic, Nuclear Finger Printing and DNA) for various matrices. Highly dependable isotopic results and information will be generated in extremely short time, hours instead of days. The presenter will discuss the generated results including tracked time used for each step of this exercise, opportunities for future improvements, path forward to achieve 6 hours TAT or less for destructive measurements.