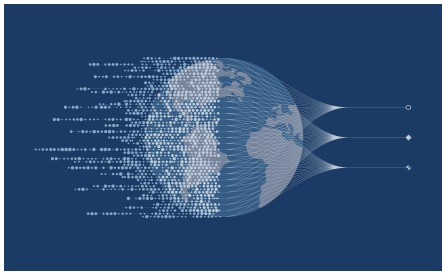

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the Presence of Shallow Subsurface Ar-39 at Multiple NNSS UNE Sites

Previously, it was reported that decades-old Ar-39 that remained from the original nuclear explosions at a few Underground Nuclear Explosion Signature Experiment testbeds (U20-az and P-tunnel) at the Nevada National Security Site had been detected. We have undertaken a set of new measurements at several additional vertically-emplaced historic UNE sites specifically chosen to investigate this signature and see strong Ar-39 detections at all sites sampled, confirming that radionuclide signatures of a UNE can be detected at the surface above for a very long time. Sampling at decades-old, closed tunnel adits was less conclusive. The historic UNEs were sampled by collecting shallow soil air samples (vertically-emplaced UNEs) or atmospheric air samples (tunnel adits). Spatial extent measurements were also undertaken at one of the locations, showing a correlation in results with distance from surface ground zero (SGZ). The samples were then processed for argon and measured at PNNL. Background samples were also processed. The measurements will be described, and the results will be presented.

E-mail

brian.Milbrath@pnnl.gov

In-person or online preference

Primary author: Mr MILBRATH, Brian (Pacific Northwest National Laboratory (PNNL))

Co-authors: Mr MILLER, Andrew (Nevada National Security Site); Mr ASHER, Benjamin (Pacific Northwest National Laboratory (PNNL)); Mr FRITZ, Brad (Pacific Northwest National Laboratory (PNNL)); Ms JOHNSON, Christine (Pacific Northwest National Laboratory (PNNL)); ZEILER, Cleat (U.S. Department of Energy, National Nuclear Security Administration); Mr HAYES, James (Pacific Northwest National Laboratory (PNNL)); Mr LOWREY, Justin (Pacific Northwest National Laboratory (PNNL)); Ms TOWNSEND, Margaret (Nevada National Security Site); Mr DIETEL, Matthew (Nevada National Security Site); Mr ALEXANDER, Thomas (Pacific Northwest National Laboratory (PNNL)); Mr MUNLEY, William (Pacific Northwest National Laboratory (PNNL))

Presenter: Mr MILBRATH, Brian (Pacific Northwest National Laboratory (PNNL))

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