

## **SURFACE AND SUBSURFACE DISTRIBUTIONS OF URANIUM-BEARING STRATA IN NORTHWESTERN NEBRASKA AND SOUTHWESTERN SOUTH DAKOTA**

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Historically, uranium was mined from open pits in Fall River and Harding counties, South Dakota. It is currently mined by in-situ leaching (ISL) in Dawes County, Nebraska, with an additional ISL facility proposed for Fall River County, South Dakota. Lithostratigraphic revisions have shown that devitrification of volcanic glass within the late Eocene Chamberlain Pass Formation (CPF - White River Group) from 38-40 Ma is the likely source of the uranium. It is concentrated within porous sandstones within the CPF, or where migration routes were available, in underlying Cretaceous sandstones. In our work we have adopted the conventions used by the University of Nebraska-Lincoln STATEMAP program in tracing the CPF in outcrops and in the subsurface. Outcrops of the CPF are herein recognized as the source of uranium contamination of soils, sediments, and surface waters near the communities of Whitney, Nebraska and Oglala, Calico, Pine Ridge, Rockyford, Red Shirt, Scenic, and Interior, South Dakota. Soil and sediment concentrations are currently being investigated at Oglala Lakota College (XRD, XRF, AA-MS, ICP-OES), although concentrations in surface waters near Pine Ridge in excess of 60 ppb have been reported (Botzum & others 2011). Subcrops of the CPF are herein recognized to be the source of uranium contamination of groundwater, often in excess of 20 ppb and as high as 40 ppb, near the communities of Pine Ridge, Wounded Knee, Manderson, Porcupine, Evergreen, Kyle, Potato Creek, and Wanblee, South Dakota (also Botzum & others, 2011). Cretaceous sandstones are the likely source of groundwater contamination near Red Shirt. High levels of radon and arsenic have also been reported from local groundwater in these communities (see Salvatore & others 2010). This research was conducted with the assistance of the Oglala Sioux Tribe Natural Resources Regulation Agency (Michael Catches Enemy, Director), and was supported by the NSF Tribal Colleges & Universities Program (Jason Tinant and Hannan LaGarry, PIs), an NSF South Dakota EPSCoR subaward to Oglala Lakota College (Gerry Giraud, PI), and an NIH Native American Research Centers for Health (University of Washington) grant to Elisha Yellow Thunder.

### **Citation:**

**LaGarry, H. E. & E. Yellow Thunder. 2012. *Surface and subsurface distributions of uranium-bearing strata in northwestern Nebraska and southwestern South Dakota.* Proceedings of the 122<sup>nd</sup> Annual Meeting of the Nebraska Academy of Sciences, pp. 91-92.**