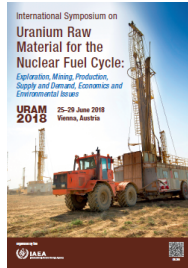


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GENETIC DEPOSIT MODEL FOR CALCRETE URANIUM IN THE SOUTHERN HIGH PLAINS REGION, UNITED STATES OF AMERICA

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The semiarid Southern High Plains (SHP) physiographic region hosts calcrete uranium deposits in Pliocene and Pleistocene sediments. This region was identified by the U.S. Geological Survey (USGS) as prospective for calcrete uranium deposits, although no deposits of this type had been identified in the US. The existence of deposits in the area was confirmed through historic exploration reports that identified two drilled deposits and additional prospects in the region. Outcropping mineralization adjacent to a known deposit was sampled and analyzed and combined with analysis of regional geology to develop a genetic deposit model. USGS dating of uranyl vanadates, and volcanic ash found in the host rock indicates periodic mineralization occurred between about 631,000 and 4,000 years before present. The entire SHP is characterized by elevated dissolved uranium in groundwater, likely derived from the Triassic Dockum Group or volcanic ash in host sediments. Elevated dissolved vanadium in groundwater, coupled with areas of higher hydraulic conductivity define areas most highly prospective for the formation of carnotite, the major ore mineral for this deposit type. Mineral-solution equilibrium modeling indicates that evaporative concentration of local groundwater could produce saturation with carnotite, which suggests that the mineralizing systems may remain active.

Country or International Organization

United States of America

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