

Sandstone-hosted uranium

Province:

Potential:

Certainty:

Critical Elements (Assessment Criteria)	Identified	Not Identified, but likely	Unlikely	Weighting
Setting				
<ul style="list-style-type: none"> • Reduced/oxidised flat lying fluvial sandstones in intracratonic basin or in a mixed fluvial-marine shelf environment. • Adjoining provenance of granitic/metamorphic rocks or felsic tuffaceous sediments interbedded or overlying the sandstones. ▪ Presence of carbonaceous matter or other reductants in the sandstones – bivalent iron, H₂S. 				
Source (fluid, metal, energy)				
<p>Fluids</p> <ul style="list-style-type: none"> • Oxidised meteoric waters draining granitic/metamorphic uranium source rocks and entering gently dipping reduced permeable sandstones in intracratonic basins or shelf environments. • Reduced fluids could rise up along faults and mix with oxidised meteoric waters. <p><i>Metals</i></p> <ul style="list-style-type: none"> • Weathering granitic/metamorphic uplands as source for 				

<p>uranium</p> <ul style="list-style-type: none"> ▪ Uranium source in felsic tuffs interbedded with or overlying sandstones <p><i>Energy</i></p> <ul style="list-style-type: none"> • Gravitational movement of oxidised meteoric waters • Upward movement of reduced waters or H₂S ▪ Igneous intrusives may generate convective cells in oxidised meteoric groundwaters. 				
Fluid pathway				
<ul style="list-style-type: none"> • Mostly permeable carbonaceous reduced sandstones and faults 				
Trap (any of the following)				
<ul style="list-style-type: none"> • Carbonaceous matter and pyrite in porous reduced sandstone • Reduced sandstones interbedded with impermeable sediments. • Reducing conditions could be provided by upward moving H₂S or 'sour gas' from underlying oil, gas fields. 				
Signs of mineralising process (any of the following, but if occurrences have been identified the level of certainty increases)				
<ul style="list-style-type: none"> • Presence of oxidised and reduced sandstones; a presence of regional redox interface indicating that deep-seated oxidation processes have taken place. • Presence of felsic intrusives, volcanics or volcanic sediments with present/palaeo drainage system draining towards suitable host rocks • Presence on uranium-channel radiometric anomalies, but may not be present if the uranium is out of equilibrium • Presence of uranium geochemical anomalies 				

<ul style="list-style-type: none"> • Known deposits of sandstone hosted uranium • Presence of other types of uranium deposits in the headwaters of the drainage system. 				
Age				
<ul style="list-style-type: none"> • Most deposits are post Silurian but a few may be Proterozoic 				
Preservation				
<ul style="list-style-type: none"> • Maintenance of reduced state of host rock essential to preserve the deposit. 				