Table A6. Fuzzy analysis for uranium prospectivity

Critical processes	*Appendix figure number*	*Input predictors map*	*Fuzzy-membership value map weight*	*Confidence factor*	*Rationale for expert-knowledge based weight (fuzzy membership values)*	*Rationale for confidence factor*
Surficial uranium deposits are classified as uranium concentrations in unconsolidated near-surface sediments or soils with secondary cementing minerals (e.g. calcite, dolomite. Surficial uranium deposits have formed during the Cenozoic by evaporation processes in fluviatile to playa systems in arid to semi-arid climatic conditions (e.g. Langer Heinrich in Namibia, Yeelirrie in Western Australia). Surficial ores are formed from accumulations of carnotite ($K_2(UO_2)_2(VO_4)_2 \cdot 3(H_2O)$) within calcretized fluvial drainage channels.Uranium and potassium are derived by surficial and/or subsurface weathering and leaching/transport of uranium and potassium from uranium-rich granitic rocks by both surficial and underground water. Vanadium derives from mafic/ultramafic rocks in the trap regions.						
Predictor map for source						
Appropriate sources of uranium are granite						
	A70	Distance to granitic rock of any age	8	8	Granites typically form good U source rocks	Granite units were extracted using spatial query from GSWA (2010) and buffered at 25 km
Predictor map for active pathways						
Uranium-potassium enriched oxidized groundwater is the main means of transportation. This enriched groundwater is brought to the surface by evaporation processes in fluviatile (channel valley) to playa systems, in arid to semi-arid climatic conditions. In situations where groundwater is close to the surface, evaporation might cause the water to move up due to capillary action.Therefore, a predictor map for paleochannels was created as they are pathways for fluid flows.						
	A71	Distance to paleochannels	9	7	Best spatial proxy for surficial uranium pathways. 3rd or higher order present drainage derived from SRTM used as proxy for paleochannel	Interpreted from SRTM with relatively low level of confidence. This predictor map was created by mapping distances (500 m on each side) of a 3rd (or higher) order present-day channel
Predictor maps for physical traps						
These deposits correspond to epigenetic near-surface uranium concentrations. Valley calcrete and playa sediments provide a favourable environment for carnotite deposition.						
	A72	Distance to valley calcrete	8	8	Calcrete is made of large grains that can precipate large amounts of K-U vanadate	Calcrete outcrops were mapped by querying GSWA (2010b) with a 100 m buffer
	A73	Distance to playa sediments	7	8	Playa sediment is made of small grains that can precipate reasonable amounts of K-U vanadate	Playa sediment outcrops were mapped by querying regolith data of GSWA (2010a) with a 100 m buffer
Predictor maps for chemical traps						
Reduction-oxidation processes control both uranium precipitation and fixation by vanadium						
	A74	Vanadium content	8	6	Vanadium element is essential to precipitate carnotite ($K_2(UO_2)_2(VO_4)_2 \cdot 3(H_2O)$).	V values from GSWA state geochemistry (GSWA, 2010) and GA Ozchem (GA, 2007) datasets were transformed to standardized Z scores (Singer and Kouda, 2001) and interpolated. The Z scores at which studentized contrast maximized were used as the anomaly thresholds (see Cheng, 2007 for details). CF low because we have interpolated the data in the whole study and some values are not known.
	A54	Distance to mafic and ultramafic rocks	8	8	Mafic and ultramafic rocks typically form good Va source rocks	Mafic and ultramafic units extracted using spatial query from GSWA (2010). 1km buffer
	A9	Distance to dyke	8	8	Dykes typically form good Va source rocks	Dyke units were extracted using spatial query from GSWA (2010) and new interpreted datasets. 1km buffer
	A75	Presence of volcanic units	7.5	8	Volcanics units typically form good V source rocks	Volcanic units extracted using spatial query from GSWA (2010b)
	A76	U anomaly in surface alluvium/sand cover. U channel of radiometric data is the best predictor.	8	9	The uranium channel in the radiometric data was the best available predictor for surficial uranium content. This was used to make the uranium content map for surface alluvium and sand-cover	Interpolated from radiometric data (GSWA, 2010b)
	A77	Uranium anomaly	8	6	High U anomaly from geochemstry is indicative of uranium mineralization	U values from the GSWA state geochemistry (GSWA, 2010a) and GA Ozchem (GA, 2007) datasets were transformed to standardized Z scores (Singer and Kouda, 2001) and interpolated. The Z scores at which studentized contrast maximized were used as the anomaly thresholds (see Cheng, 2007 for details). CF low because we have interpolated the data in the whole study and some values are not known.