

## ABBREVIATIONS

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<b>ARR</b>	Alligator Rivers Region
<b>ARRAC</b>	Alligator Rivers Region Advisory Committee
<b>ARRTC</b>	Alligator Rivers Region Technical Committee
<b>DEWHA</b>	Department of the Environment, Water, Heritage and the Arts
<b>DRET</b>	Department of Resources, Energy and Tourism
<b>DRDPiFR</b>	Department of Regional Development, Primary Industry, Fisheries and Resources
<b>EMS</b>	Environmental Management System
<b>ERA</b>	Energy Resources of Australia Ltd
<i>eriss</i>	Environmental Research Institute of the Supervising Scientist
<b>ERs</b>	Environmental Requirements
<b>EWLS</b>	Earth Water Life Sciences Pty Ltd
<b>G8210009</b>	Magela Creek d/s (downstream) gauging station
<b>GAC</b>	Gundjehmi Aboriginal Corporation
<b>IAEA</b>	International Atomic Energy Agency
<b>ICRP</b>	International Commission on Radiological Protection
<b>KKN</b>	Key Knowledge Needs
<b>LAA</b>	Land application area
<b>MCUS</b>	Magela Creek u/s (upstream) site
<b>MTC</b>	Minesite Technical Committee
<b>NLC</b>	Northern Land Council
<b>NRETAS</b>	Department of Natural Resources, Environment, the Arts and Sport
<i>oss</i>	Office of the Supervising Scientist
<b>RJTWG</b>	Rum Jungle Technical Working Group
<b>RL</b>	Reduced Level – the number after RL denotes metres above or below a chosen datum
<b>RMC</b>	Rockhole Mine Creek
<b>RPI</b>	Routine Periodic Inspection
<b>SSAR</b>	Supervising Scientist Annual Report
<b>SSD</b>	Supervising Scientist Division
<b>TRaCK CERF</b>	Tropical Rivers and Coastal Knowledge Commonwealth Environmental Research Facilities
<b>TRIAP</b>	Tropical Rivers Inventory and Assessment Project
<b>TSF</b>	Tailings Storage Facility
<b>UEL</b>	Uranium Equities Limited

## GLOSSARY

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1s – 7s	When referring to ore and stockpiles indicates the amount of extractable uranium in the ore (grade). At Ranger, 1s indicates the lowest grade (waste) and 7s indicates the highest grade ore.
airborne gamma survey	Aerial measurements of the terrestrial gamma radiation using a large volume sodium iodide (NaI) detector on board an aircraft.
alpha radiation ( $\alpha$ )	A positively charged helium ( $\text{He}^{2+}$ ) nucleus (two protons + two neutrons) that is spontaneously emitted by an energetically unstable heavy atomic nucleus (such as $^{226}\text{Ra}$ or $^{238}\text{U}$ ).
application	A document stating how the mining operator proposes to change the conditions set out in the mining Authorisation. These changes need to be approved by all MTC stakeholders.
authorisation	For mining activities authorisation is required under the Northern Territory <i>Mining Management Act (MMA)</i> for activities that will result in substantial disturbance of the ground. It details the authorised operations of a mine, based on the submitted mining management plan and any other conditions that the Northern Territory Minister considers appropriate.
becquerel (Bq)	SI unit for the activity of a radioactive substance in decays per second [ $\text{s}^{-1}$ ].
beta radiation ( $\beta$ )	A high energy electron or positron emitted when an unstable atomic nucleus (such as $^{90}\text{Sr}$ or $^{40}\text{K}$ ) loses its excess energy.
bioaccumulation	Occurs when the rate of uptake by biota of a chemical substance, such as metals, radionuclides or pesticides is greater than the rate of loss. These substances may be taken up directly, or indirectly, through consumption of food containing the chemicals.
bioavailable	The proportion of the total present (in water, sediment, soil or food) of metals and radionuclides, that can be taken up by biota (see also bioaccumulation).
biodiversity (biological diversity)	The variety of life forms, including plants, animals and micro-organisms, the genes they contain and the ecosystems and ecological processes of which they are a part.
biological assessment	Use and measurement of the biota to monitor and assess the ecological health of an ecosystem.
bund	Embankment or wall designed to retain contents (usually liquids) in the event of leakage or spillage from a storage facility.
biological community	An assemblage of organisms characterised by a distinctive combination of species occupying a common environment and interacting with one another.

concentration factor	The metal or radionuclide activity concentration measured in biota divided by the respective concentration measured in the underlying soil (for terrestrial biota) or water (for aquatic biota).
damp-proof course	A waterproof barrier comprising bitumen and aluminium.
direct seeding	Vegetation is established by broadcasting seed across the area to be revegetated.
dissolved organic carbon	Natural organic material from plants and animals that has broken down and is able to pass through a very fine (0.45 micrometre) filter.
dose coefficient	The committed tissue equivalent dose or committed effective dose Sievert [Sv] per unit intake Becquerel [Bq] of a radionuclide. See definition of Sievert and Becquerel.
dose constraint	The International Commission on Radiation Protection (ICRP) defines dose constraint as ' <i>a prospective restriction on anticipated dose, primarily intended to be used to discard undesirable options in an optimization calculation</i> ' for assessing site remediation options.
early detection	Measurable early warning biological, physical or chemical response in relation to a particular stress, prior to significant adverse affects occurring on the system of interest.
flume	A channel control structure with known cross-sectional area used to measure flow rate of runoff water.
fulvic acid	A component of dissolved organic carbon that is especially reactive and forms strong complexes with metals. Fulvic acids account for a large part of the dissolved organic matter in natural water.
gamma radiation ( $\gamma$ )	High energy electromagnetic radiation emitted by excited nuclei (for example after an alpha or beta decay) in their transition to lower-lying nuclear levels.
grab sampling	Collection of a discrete water sample for chemical analysis
Gray (Gy)	Name for absorbed dose 1 Gray = 1 Joule·kg <sup>-1</sup> . The absorbed dose gives a measure for the energy imparted by ionising radiation to the mass of the matter contained in a given volume element.
half-life	Time required to reduce by one-half the concentration (or activity in the case of a radionuclide) of a material in a medium (eg soil or water) or organism (eg fish tissue) by transport, degradation or transformation.
Hydstra	Hydrology data management software package.
IC50	The concentration of a compound that causes a 50% inhibition in a particular response (eg growth, reproduction) of an organism relative to that of a control organism (ie an organism not exposed to the compound).

ionising radiation	Sub-atomic particles ( $\alpha$ , $\beta$ ) or electromagnetic ( $\gamma$ , x-rays) radiation that have enough energy to knock out an electron from the electron shell of molecules or atoms, thereby ionising them.
land application	A method for management of excess accumulated water by spray irrigation. The method depends on the evaporation from spray droplets, and from vegetation and ground surfaces once its reaches them.
laterite	In the Ranger mine context, laterite is a local term used to describe well weathered rock and soil profile material that consists primarily of a mixture of sand and silt/clay size particles. It may or may not exhibit characteristics of a fully-developed laterite profile.
LC50	The concentration of a compound that causes the death of 50% of a group of organisms relative to that of a control group of organisms (ie a group of organisms not exposed to the compound).
MOL	Maximum Operating Level. The maximum level at which a liquid containing impoundment can be operated.
ore	A type of rock that bears minerals, or metal, which can be extracted.
permeate	The higher purity stream produced by passage of water through a reverse osmosis (RO) treatment process.
polished	Water that has been passed through a wetland filter.
pond water	Water derived from seepage and surface water runoff from mineralised rock stockpiles as well as runoff from the processing areas that are not part of the process water circuit.
potable water	Water suitable for human consumption.
process water	Water that has passed through the uranium extraction circuit, and all water that has come into contact with the circuit. It has a relatively high dissolved salt load constituting the most impacted water class on site.
radiologically anomalous area	Area that displays significantly above background levels of radioactivity.
radionuclide	An atom with an unstable nucleus that loses its excess energy via radioactive decay. There are natural and artificial radionuclides. Natural radionuclides are those in the uranium ( $^{238}\text{U}$ ), actinium ( $^{235}\text{U}$ ) and thorium ( $^{232}\text{Th}$ ) decay series for example, which are characteristic of the naturally occurring radioactive material in uranium orebodies.
radium	A radioactive chemical element that is found in trace amounts in uranium ores.
radon	Colourless, odourless, tasteless, naturally-occurring radioactive noble gas formed from the decay of radium.
Sievert (Sv)	Name for equivalent dose and effective dose $1 \text{ Sievert} = 1 \text{ Joule}\cdot\text{kg}^{-1}$ . In contrast to the Gray, the Sievert takes into account both the type of radiation

	and the radiological sensitivities of the organs irradiated, by introducing dimensionless radiation and tissue weighting factors, respectively.
sonde	A water quality instrument that is immersed in water for measuring (typically) electrical conductivity, pH, turbidity and dissolved oxygen.
speciation (of an element)	The forms in which an element exists within a particular sample or matrix.
stable lead isotopes	Lead has four stable isotopes, three of which, <sup>206</sup> Pb, <sup>207</sup> Pb and <sup>208</sup> Pb, are end members of the natural uranium, actinium and thorium decay series, respectively. <sup>204</sup> Pb is primordial only.
tailings	A slurry of ground rock and process effluents left over once the target product, in this case uranium, has been extracted from mineralised ore.
thoriferous	Containing thorium.
toxicity monitoring	The means by which the toxicity of a chemical or other test material is determined in the field over time. The monitoring comprises field toxicity tests which are used to measure the degree of response produced by exposure to a specific level of stimulus (or concentration of chemical).
tube stock	Seeds are germinated in a plant nursery and the young seedlings are then planted out.
uraniferous	Containing uranium.
uranium oxide	An oxide of uranium which occurs naturally or is produced by a uranium extraction process. This is the product from the Ranger mine.
water treatment plant (WTP)	The process system that removes undesirable chemicals, materials, and biological contaminants from water thereby decreasing its ability to harm the environment.