



GLOSSARY

Below are terms used throughout the Ranger Mine Closure Plan

Key term	Definition
Airborne radiometric survey	Estimation of the concentration of radioactive elements in the surface of the landform via the detection of gamma radiation using low flying aircraft.
Annual Plan of Rehabilitation	High level plan used to determine the securities amount to be held by the Commonwealth Government for Ranger Mine rehabilitation obligations.
As low as reasonably achievable	Abbreviated to ALARA. As low as reasonably achievable, economic and social factors being taken into account.
BC distillate	The product stream produced by BC plant treatment that has very low dissolved solids. Subject to water quality criteria this product may be discharged to the environment.
Becquerels	The Becquerel (Bq) is the SI derived unit of radioactivity. One Becquerel is defined as the activity of a quantity of radioactive material in which one nucleus decays per second.
Benchmark dose rate	Also referred to as environmental reference level, a chronic radiation dose rate received by the most highly exposed individuals of non-human biota that would be unlikely to have significant effects on terrestrial or aquatic populations
Best Practicable Technology	Technology from time to time relevant to the Ranger Project which produces the maximum environmental benefit that can be reasonably achieved having regard to all relevant matters.
Bininj	<p>Bininj means many things depending on context:</p> <ol style="list-style-type: none"> 1. Bininj means 'Aboriginal person' as opposed to a non-Aboriginal person. 2. Bininj means a speaker of Bininj Kunwok languages and a person of local Aboriginal descent (as opposed to say, a Yolngu person from NE Arnhem Land or 'Mungguy' which is the Jawoyn language equivalent) 3. Bininj means a man as opposed to a daluk (a woman). 4. Bininj means a human being as opposed to a non-human animal. <p>In the context of the mine closure Bininj means a speaker of Bininj Kunwok languages and a person of local Aboriginal descent.</p>
Bioregion	An ecologically and geographically defined area that is smaller than a biogeographical realm ,but larger than ecoregion or an ecosystem, in the World Wildlife Fund classification scheme.
Brecciated	Rock that has been mechanically broken by faulting and shearing, resulting in angular fragments
Brine Concentrator (BC)	A treatment facility that treats process water by distillation to produce a clean product stream (distillate) and a waste stream (brine).
Brine	A generic term for the waste stream from the BC, BS or WTP. For each plant, the brine stream contains most of the salt removed from the feed stream to the plant in a concentrated liquid form. The handling of a brine stream depends on the characteristics of that stream.



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Key term	Definition
Bulk material movement	The movement of stockpiled waste rock for the purposes of backfill and the construction of the final landform
Capping (initial and secondary)	The placement of waste rock above the tailings in Pit 3. Capping layers provide drainage and act to dissipate the bearing pressure of construction equipment.
Closure criteria	Direct, measurable and quantifiable target values or tiered assessment processes, developed to demonstrate achievement of the closure objectives
Closure domain	Areas with similar features, decommissioning and/or rehabilitation requirements for closure.
Closure phase	Period between 8 January 2021 & 8 January 2026 Decommissioning, completion of rehabilitation & transition of monitoring requirements
Collection basin	Smaller constructed storage facility built to capture runoff along the western stockpile (Collection Basin 1, CB3, CB4, CB5, and CB6) which requires pond water treatment. Note that CB2 collects clean runoff and WTP permeate which passively drains into RP1.
Conceptual Reference Ecosystem	A conceptual model of a natural reference ecosystem adjusted to accommodate changed or predicted environmental conditions, synthesised from numerous natural reference sites and modified based on evidence from research, trials, experience, benchmarking, and historical and predictive records.
Contaminated Land Risk Register	Register of all sites where activities have occurred that have the potential to contaminate land on the RPA.
Constituents of potential concern	Chemical elements identified by the Supervising Scientist Division as being of potential concern to the receiving environment
Diameter at breast height	Measurement of tree diameter taken at 1.3 m above ground level (an adult's approximate breast height).
Digital Elevation Model	Digital representation of the land topography
Disposal	The final transfer of release water into the environment. Disposal requires compliance with regulatory water quality criteria and must only be transferred from an approved location.
Direct discharge	The disposal of release water from a control point into an authorised water course location when flowing (i.e. MG001) or enables passive transfer to the environment (i.e. RP1 and GC2).
Electrical conductivity	Abbreviated to EC. Electrical conductivity is a measure of how well a material accommodates the transport of electric charge.
Environmental Requirements	The Ranger Environmental Requirements are attached to the s.41 Authority and set out Primary and Secondary Environmental Objectives, which establish the principles by which the Ranger operation is to be conducted, closed and rehabilitated and the standards that are to be achieved.
ERICA Assessment	Exposure/dose/effect assessment for radiological risk to terrestrial, freshwater and marine biota.



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Key term	Definition
Gamma Radiation	Ionizing electromagnetic radiation emitted by a radionuclide during radioactive decay
Georgetown Billabong	The statutory surface water monitoring point for Georgetown Billabong, which is located downstream of Corridor Creek and the Corridor Creek wetland filter.
Gray	The Gray (Gy) is a SI derived unit of ionizing radiation dose. One Gray is defined as the adsorption of one joule of radiation energy per kilogram of matter.
Groundwater conceptual model	Calibrated numerical groundwater flow model encompassing all hydrogeologic elements governing groundwater flow and transport at the Ranger Mine to provide the foundation for simulating groundwater flow and transport from all mine sources to potential receptors under post-closure conditions.
Groundwater solute transport modelling	Prediction of the temporal and spatial mobilisation of constituents of potential concern from the Ranger Project Area to the surrounding environment through groundwater using the Groundwater conceptual model.
Hydrolithologic unit	A grouping of soil or rock units or zones based on common hydraulic properties.
Hydrolithologic zone	Groupings of hydrolithologic units based on similar geological and groundwater flow and transport characteristics.
Irrigation	A form of disposal which allows release water to be dispersed via a sprinkler system over an approved land application area (LAA) at an approved rate.
Land Application Area	Abbreviated to LAA. An area on the RPA used as an evapotranspiration disposal method polished and unpolished pond water from the constructed wetlands filters and, more recently, permeates from the water treatment plants. However, irrigation of unpolished pond water ceased at the end of 2009. The concept of land application is to retain metals and radionuclides in the near-surface soil profile.
Land Disturbance Permit	An ERA permit required prior to undertaking any work on the RPA that may lead to surface disturbance, for example ground breaking, surface disturbance, clearing etc.
Landform Evolution Model	Numerical model that simulates the change in landscape over time in response to various parameters.
LiDAR	Remote sensing technique using pulsed laser to measure distances
Long Lived Alpha Activity	Abbreviated to LLAA. The presence, generally in airborne dust, of any of the alpha emitting radionuclides in uranium ore, except for the short lived alpha emitting radon decay products.
MBL Zone	A hydrolithologic zone of relatively higher permeability to the south east of Pit 1 identified through testing and pumping of bore MB_L.
Magela Creek downstream	Abbreviated to MG009. MG009 is Ranger downstream statutory or compliance surface water monitoring point. It is located on the Magela Creek, downstream of Ranger operations.
Magela Creek upstream	Abbreviated to MCUS. MCUS is the upstream statutory surface water monitoring point, location on the RPA.
Maximum Operating Level	Maximum height permitted for process water in the TSF and Pit 3. Maximum operating level also applies to the maximum deposited height of tailings in Pit 3.



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Key term	Definition
Mine Closure Plan	A dynamic plan presenting all past, present and future rehabilitation activities of the Ranger Project Area in order to demonstrate that closure activities will achieve the relevant Environmental Requirements. Submitted annually for approval, the plan provides updates of the preceding year.
Minesite Technical Committee	The Minesite Technical Committee, convened in accordance with Attachment A of the Working Arrangements for the Regulation of Uranium Mining in the Northern Territory dated 30 May 2005, is tasked with: Reviewing proposed and existing approvals and decisions under NT legislation Reviewing technical information in relation to Ranger Mine, including monitoring data and environmental performance Collaboratively developing standards for the protection of the environment Developing strategies to address emerging issues The MTC consists of the representatives of the Department of Industry, Tourism and Trade, the Supervising Scientist, ERA and the Northern Land Council. Representatives of the Commonwealth Department of Industry, Science, Energy and Resources may also attend MTC meetings.
Mirarr	Mirarr is a patrilineal descent group. Descent groups are often called 'clans' in English and kunmokurrkurr in Kundjeyhmi language. There are several Mirarr clans with each one distinguished by the language they historically spoke (e.g. Mirarr Kundjeyhmi, Mirarr Umingangk, Mirarr Erre). The Mirarr are the Traditional Owners of the land encompassing the RPA.
Monitoring and maintenance phase	Period after 8 January 2026 Completion criteria monitoring (and maintenance rehabilitation works if required) Site access pending.
Monitoring Evaluation and Research Review Group	Comprised of members of ERA and SSB, as well as subject matter experts as required, the group is tasked with the ongoing development and refinement of research and monitoring programs during the progressive rehabilitation period
Operations phase	Period prior to 8 January 2021 Progressive rehabilitation occurring, and operational, closure & research monitoring
Pit 1	The mined out pit of the Ranger #1 orebody, which is used as a tailings repository. Mining in Pit 1 commenced in May 1980 and was completed in December 1994, after recovering 19.78 million tonnes of ore at an average grade of 0.321%.
Pit 3	The mined out pit of the Ranger #3 orebody, which is currently being backfilled with tailings. Open cut mining in Pit 3 commenced in July 1997 and ceased in November 2012.
Pit 1 Progressive Rehabilitation Monitoring Framework	Overarching framework of environmental monitoring for the rehabilitation of Pit 1
Plant Available Water	Abbreviated to PAW. The amount of water that can be stored in a soil and be available for growing crops.
Pond water	Water of a quality that requires active management.



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Key term	Definition
	Derived from rainfall that falls on the active Minesite catchments. The main storage facilities for pond water include Retention Pond 2 (RP2), RP3 and RP6.
Potable water	Potable water is sourced from the Brockman Borefield located in the south-east of the RPA. A second production borefield (Magela Borefield) was established to the north of Jabiru East, primarily as a source of supply for Jabiru East and the Ranger Mine village. Grey water (e.g. from showers and toilets) is treated on site and pumped into septic tanks and then to leach drains.
Potential Alpha Energy Concentration	The concentration of the total alpha energy emitted in air during the decay of radon-222 progeny. Usually measured in $\mu\text{J m}^{-3}$.
Process water	The most impacted water class on site. Currently stored in the TSF and Pit 3. The process water inventory is derived predominantly from water that has passed through or encountered the uranium extraction circuit, and rainfall from designated process water catchments.
Processing	Processing is the mining term to describe all phases of the ore treatment from milling through to the final product packaging of uranium oxide.
Radon decay products or radon progeny	The short-lived radioactive decay products of radon-222. This includes the decay chain up to, but not including lead-210, namely polonium-218 (sometimes called radium A), lead-214 (radium B), bismuth-214 (radium C) and polonium-214 (radium C).
Radon exhalation	Amount of radon leaving the surface of the landform
Ranger Project Area	Abbreviated to RPA. The Ranger Project Area means the land described in Schedule 2 to the Commonwealth Aboriginal Land Rights (Northern Territory) Act 1976.
Ranger Mine water management technology	Refer Appendix 2.1 for the definitions for common terms used in water management.
Reference Level	Reference Level abbreviated to RL. Denotes a specific elevation relative to mean sea level and is regularly used to identify the height or depth of plan or mine infrastructure – e.g. the height of the TSF or depth of Pit 3
Reject streams	Water treatment plant brines: Water that contains the remaining dissolved solids removed from the pond water. Brines are typically discharged to the process water inventory. However, brines may be discharged to the pond water inventory based on operational requirements. BC brines: Residue water after the distillate has been extracted. OBS brines: residue water that contain the remaining dissolved solids removed from the treatment of pond water brines. Typically, discharged to the process water inventory or alternatively to pond water inventory based on operational requirements. High Density Sludge product water: water arising for the lime treatment process of the HDS plant to remove most salts present in process water. HDS product water may be either recycled to the process water inventory, or subject



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Key term	Definition
	to further approvals, sent directly to the water treatment plants or discharged into the pond water inventory
Release Plan Calculator	Basic mass balance equation model used to assist with the prediction of changes in water quality between upstream (MCUS) and downstream (MG009) monitoring points. The RPC is used to determine when it is appropriate to actively release water from the minesite
Release water	Release water is derived from incident rainfall that falls on catchments within the mine footprint and is of a high enough quality that it is possible to leave on the site as storm water runoff. Specific streams are routed through passive treatment systems or staging points for management and release (Error! Reference source not found.).
Relinquishment	Issue of close-out-certificate(s), relinquishment of RPA Successive close-out certificates may be obtained for areas rather than for the entire RPA at a single point in time
Retention Pond	A large constructed storage facility that collects runoff and stores pond water for treatment (RP2 & RP6) or release water post-treatment (RP1).
Revegetation domains	Areas of disturbance, to be revegetated, differentiated on their likely physical and chemical constraints that will influence both the initial establishment and the long-term growth, development and functioning of revegetated plant communities.
Risk	The chance of something happening that will have an impact on objectives NOTE 1: A risk is often specified in terms of an event or circumstance and the consequences that may flow from it. NOTE 2: Risk is measured in terms of a combination of the consequences of an event and their likelihood NOTE 3: Risk can be a threat or an opportunity
Risk Analysis	Systematic process to understand the nature of and to deduce the level of risk NOTE 1: Provides the basis for risk evaluation and decisions about risk treatment.
Risk Assessment	The overall process of Risk Identification, Risk Analysis and Risk Evaluation and shall be retained in accordance with procedure.
Risk Control	The process of elimination or minimisation of risks.
Risk Evaluation	The process used to determine risk management priorities by comparing the level of risk against predetermined standards, target risk levels or other criteria
Risk Management Process	The systematic application of management policies, procedures and practices to the tasks of establishing the context, identifying, analysing, assessing, controlling and monitoring risk
Risk Priority Class	One of four categories where a hazard can be located on the ERA Ranger Risk Matrix – from CRITICAL to HIGH to MODERATE to LOW
Risk Ranking	The level of risk allocated to a non-conformance if a corrective or preventative action is not carried out. The 5 x 5 Consequence/Probability model.
Risk Register	A register of risk information and controls kept at ERA, categorized into functional areas
Sievert	The Sievert is the unit of absorbed radiation dose, taking into account the differing biological effects of different types of radiation.



Key term	Definition
Subaerial tailings deposition	Deposition of tailings in air, e.g. from spigots or pipes above the surface of the water
Subaqueous tailings deposition	Deposition of tailings below the surface of the water
Tailings dam	Surface dam used to hold tailings and process water at Ranger. Commonly referred to as "tailings storage facility" or "TSF" in other ERA material. The tailings dam is one of currently three tailings storage facilities at Ranger, the others being Pit 1 and Pit 3.
Tailings flux/ Consolidation flux	Process water squeezed from reducing pore spaces during the consolidation of tailings
Transfer	The process of physically distributing water across the water management system using pumps, pipes, valves and other supporting infrastructure to meet operational requirements.
Treated water	<p>Treated water is water that has passed through one of the three water treatment plants, the Osmoflow Brine Squeezer (OBS) or through the BC.</p> <p>Treated water is divided into the following categories:</p> <p>Water treatment plant permeate: Water that has been treated to remove a significant amount of its dissolved solids to allow it to be released.</p> <p>BC distillate: Purified water that is produced by the BC. Treated distillate is subject to release criteria.</p> <p>Osmoflow Brine Squeezer (OBS) permeate: water derived from further reverse osmosis treatment of water treatment plant brines by the Brine Squeezer. Water quality is equivalent to water treatment plant permeate.</p>
Treatment Facility	Infrastructure that has been installed to undertake water treatment to achieve desired water quality outputs that is suitable for disposal. The main treatment facilities on site include: Brine Concentrator (BC), Water Treatment Plants (WTPs), Brine Squeezer (BS) and High Density Sludge (HDS) plant.
Treatment product	Water that has undergone treatment to remove excess solutes and improve water quality. The product stream from primary treatment may be suitable for disposal (i.e. BC distillate, BS permeate and WTP permeate) or may require secondary treatment prior to disposal (i.e. HDS product).
Treatment waste	The waste stream produced by the water treatment facilities which contains a higher concentration of solutes due to removal from the original feed water. This also includes water that is used during backwashing and cleaning processes. Treatment waste must be retained on site and returned to source storage for further processing.
Trigger, Action, Response Plan	Abbreviated to TARP. Plan of tasks to be undertaken should monitoring detect a change in parameters of a level that requires preventative or remedial action.
Underfill	Initial fill of waste rock placed in the base of Pit 3.
U3O8	The most stable form of uranium oxide and the form most commonly found in nature. Uranium oxide concentrate is sometimes loosely referred to as yellowcake. It is khaki in colour and is usually represented by the empirical formula U3O8. Uranium is normally sold in this form.
Vadose zone	The portion of the sub-surface that lies between ground surface and the water table or saturated zone.



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Key term	Definition
Vulcan	A design, modelling and planning software package that is used in mine processes, mine design, scheduling and rehabilitation.
WA mine closure guidelines	Guidance documentation provided by the Western Australia Department of Mines, Industry Regulation and Safety for the development of mine closure plans.
Waste rock	The mineral waste produced in the mine but is stockpiled due to its low grade i.e. material which does not enter the processing plant. For example, 1s waste rock is typically material that has a grade of less than 0.02% U3O8; 2s waste rock (or low grade ore) is typically material that has between 0.02% and 0.12% U3O8.
Water inventory	The volume of a water class that exists on site at a single point in time. Inventories are inferred from water level measurements or measured by survey across various storages.
Water Management System	The infrastructure, operations and procedures required to manage water at Ranger which includes capturing, storing, transferring, treating and disposing volumes of water.
Water storage facility	A designated area or structure where a particular water class will be contained prior to future transfers, treatment or disposal pathways. For example, process water storage facilities include the Tailings Storage Facility (TSF) and Pit 3.
Water Treatment Plants (WTPs)	A series of ultrafiltration/reverse osmosis treatment plants that treat pond water to create a clean product stream (permeate) suitable for disposal and a waste stream (brine).
Wetland filter	A constructed biological filter system that is designed for final treatment of release water and is monitored to ensure water quality meets regulatory criteria for disposal.
Wicks / Prefabricated Vertical Drains	Drains inserted vertically into unconsolidated tailings material in Pit 1 and 3. The drains consist of plastic strips wrapped in geofabric with extruded channels that allow water to drain upwards from the tailings as it consolidates
XPAC	A mine scheduling software.



ABBREVIATIONS & ACRONYMS

Below are abbreviations and acronyms that are used throughout the Mine Closure Plan

Abbreviation/ Acronym	Description
1G project	1 Gigalitre project
1s	Waste rock material that typically has a grade of less than 0.02% U ₃ O ₈
2s	Waste rock (or low grade ore) material that typically has between 0.02% and 0.12% U ₃ O ₈
AALL	Annual Additional Load Limits
AAPA	Aboriginal Areas Protection Authority
ACF	Australian Conservation Foundation
AEP	Annual Exceedance Probability
AHD	Australian height datum
ALARA	As Low As Reasonably Achievable
APR	Annual Plan of Rehabilitation
ANRDR	Australian National Radiation Dose Register
ANZEEC	Australian and New Zealand Environment and Conservation Council
APR	Annual plan of rehabilitation
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ARRAC	Alligator Rivers Region Advisory Committee
ARRTC	Alligator Rivers Region Technical Committee
ASIC	Australian Securities and Investment Commission
ASNO	Australian Safeguards and Non-Proliferation Office
ASS	Acid Sulfate Soils
BACIP	Before-After Control-Impact Paired sampling
BC	Brine Concentrator
BMM	Bulk material movement
BOM	Bureau of Meteorology
BPT	Best Practicable Technology
BTV	Background Threshold Value
C&M	Care and maintenance
CCD	Counter Current Decantation
CCWG	Closure Criteria Working Group
CCWLF	Corridor Creek Wetland Filter
CIP	Closure Implementation Plan


ERA

CPT	Cone Penetration Test
CLM	Contaminated Land Management
CPT	Cone Penetration Test
CRE	Conceptual Reference Ecosystem
COPC/COPCs	Constituent of Potential Concern / Constituents of Potential Concern
CRF	Cemented rock fill
CRS	Corridor Road Sump
CSM	Conceptual Site Model
DCM	Department of the Chief Minister
DEM	Digital Elevation Model
DIIS	Department of Industry, Innovation and Science
DISER	Commonwealth Department of Industry, Science, Energy and Resources (formally DIIS)
DITT	Department and Industry, Tourism and Trade
DPIR	Department of Primary Industry and Resources (now DITT)
DPMC	Department of Prime Minister and Cabinet
DWPZ	Deeps Water Producing Zone
EC	Electrical Conductivity
ECVs	Environmental and Community Values
EDR	Electro Dialysis Reversal
EDZ	Excavation-damaged zone
EIL	Environment Investigation Levels
EIS	Environmental Impact Statement
<i>EPBC Act</i>	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
<i>EPIP Act</i>	<i>Environmental Protection (Impact of Proposal) Act 1974</i>
ER	Environmental Requirements
ERICA	Environmental Risk from Ionising Contaminants: Assessment and management
ERISS	Environmental Research Institute of the Supervising Scientist
ET	Evapotranspiration
FIFO	Fly In Fly Out
FLF	Final Landform
FS	Feasibility Study
GAC	Gundjehmi Aboriginal Corporation
GCBR	Georgetown Creek Brockman Road
GCC	Gulungul Creek Control



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GCLB	Gulungal Creek water monitoring site
GCMBL	Georgetown Creek Median Bund Leveline
GCMP	Ground Control Management Plan
GDE	Groundwater Dependent Ecosystem
GIS	Geographic Information System
GPS	Global Positioning System
GTB	Georgetown Billabong
GV	Guideline Value
H&S	Health and Safety
HDPE	High Density Polyethylene
HDS	High Density Sludge
HIL	Health Investigation Level
HLU	Hydrogeological Unit
HSE	Health, Safety and Environment
HSEC	Health, Safety, Environment and Communities
HSEQ	Health, Safety, Environment and Quality
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
IMAP	Inventory Multi-tiered Assessment and Prioritisation
ISWWG	Independent Surface Water Working Group
ITWC	Integrated Tailings and Water Closure (Preliminary assessment)
JHA	Job hazard analysis
JTDA	Jabiru Town Development Authority
KKN	Key Knowledge Needs
KNPS	Kakadu Native Plants Pty Ltd
LAA	Land Application Area(s)
LAI	Leaf Area Index
LEM	Landform Evolution Model
LLAA	Long Lived Alpha Activity
LiDAR	Light Detection and Ranging
LIMS	Laboratory Information Management System
MCP	Mine Closure Plan
MCUS	Magela Creek Upstream water monitoring site
MERGG	Monitoring Evaluation Research Review Group
MNES	Matters of National Environmental Significance
MOL	Maximum Operating Level



ERA

MOU	Memorandum of Understanding
mRL	Metres Reference Level
MTC	Minesite Technical Committee
NAQS	Northern Australia Quarantine Strategy
NGO	Non-government Organisations
NLC	Northern Land Council
NOHSC	National Occupational Health and Safety Commission
NP	National Park
NSMC	Null space Monte Carlo
NT	Northern Territory
NTP	Northern Territory Portion
OBS	Osmoflow Brine Squeezer
O&M	Operations and Maintenance
OPSIM	Operation Simulation Modelling
PAEC	Potential Alpha Energy Concentration
PAW	Plant Available Water
PDF	Probability Distribution Function
PEST	Parameter Estimation Tool
PFS	Prefeasibility Study
PMP	Probable Maximum Precipitation
PSD	Particle Size Distribution
PTF	Pit Tailing Flux
PVD	Prefabricated Vertical Drains
Q1	Quarter 1, as in first quarter of the calendar year. Also Q2, Q3 and Q4.
QA	Quality Assessment
QQ plot	Quantile-quantile Plot
R3D	Ranger 3 Deeps
RBS	Risk Breakdown Structure
RCCF	Ranger Closure Consultative Forum
RCM	Ranger Conceptual Model
RL	Reference Level
RMV	Ranger Mine Village
RO	Reverse osmosis
ROM	Run-of-mine
RP1	Retention Pond 1 – also denotes other retention ponds used on site – e.g. RP2, RP3, RP6


ERA

RP1WLF	Retention Pond 1 Wetland Filter
RPA	Ranger Project Area
RPC	Release Plan Calculator
RSA Archer	Risk Management Tool
RSWM	Ranger Surface Water Model
RTBS	Rio Tinto Business Solution
RWMP	Ranger Mine Water Management Plan
SAQP	Sampling Analysis Quality Plan
SIA	Social Impact Assessment
SSB	Supervising Scientist Branch
SX	Solvent Extraction
TAN	Total Ammoniacal Nitrogen
TARP	Trigger, Action, Response Plan
TDS	Total Dissolved Solids
TLF	Trial Landform
TO	Traditional Owner
TPH	Total Petroleum Hydrocarbon
TPM	Total Particulate Metals
<i>TPWS Act</i>	<i>Territory Parks and Wildlife Conservation Act 1978 (NT)</i>
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
UF/MFRO	Ultrafiltration/Microfiltration and Reverse Osmosis
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
VAF	Vulnerability Assessment Framework
VSEP	Vibratory Shear Enhanced Processing
WA	Western Australia
WARC	West Arnhem Regional Council
WASWG	Water and Sediment Working Group
WLF	Wetland Filter
WoNS	Weeds of National Significance
WQMF	Water Quality Management Framework
WRD	Water Resources Division
W/SQO	Water or Sediment Quality Objectives
WTP	Water Treatment Plant



CHEMICAL SYMBOLS AND FORMULAE

Symbols/ formulae	Description
Al	Aluminium
Ba	Barium
Ca	Calcium
Cd	Cadmium
Cl	Chloride
Cr	Chromium
Cu	Copper
Fe	Iron
HCO ₃	Bicarbonate
K	Potassium
Mg	Magnesium
Mn	Manganese
Na	Sodium
NH ₃ -N	Ammoniacal nitrogen
Ni	Nickle
NO ₂	Nitrogen dioxide
NO ₃	Nitrate ion
NO ₃ -N	Nitrate-N
NO _x	Total mono-nitrogen oxides (NO and NO ₂)
OH	Hydroxide
P	Phosphorus
Pb	Lead
²¹⁰ Po	Polonium
PO ₄ -P	Phosphate
²²⁶ Ra / Ra-226	Radium
Si	Silicon
SiO ₂	Silica
SO ₄ ²⁻	Sulfate
TAN	Total ammonia nitrogen
Total-N	Total nitrogen
Total-P	Total phosphorus
U, ²³⁸ U	Uranium



Symbols/formulae	Description
U^{3O^8}	Uranium oxide
V	Vanadium
Zn	Zinc

SYMBOLS / UNITS OF MEASUREMENTS

Unit of measure	Description
θ_{fc}	Water content at field capacity
θ_{pwp}	Permanent wilting point
%	Percentage
μg	Micrograms
Bq	Becquerel(s)
$Bq\ kg^{-1}$	Becquerel per kilogram
$Bq\ m^{-2}\ s^{-1}$	Becquerel per square metre per second
cm	Centimetre
dB	Decibels
GL	Gigalitre
ha	Hectare
kg	Kilogram
km	Kilometre
km/h	Kilometres per hour
km^2	Square kilometres
kt	1,000 metric tonnes
L	Litre
m	Metre
m^2	Square metre
m^3	Cubic metre
$m^3\ s^{-1};\ m^3/s$	Cubic metre per second
mBq	Millibecquerel
mg	Milligram
ML	Megalitre
mm	Millimetre
Mm^3	Million cubic metres


ERA

Unit of measure	Description
MPa	Megapascal
mRL	Metres relative level
mSv	Milli-sievert
Mt	Metric tonne
t/m ³	Tonne / cubic metre
µm	Micrometre
µS/cm	Micro Siemens per centimetre
µSv/y	Microsieverts per year
st	Stems
wt. %	Weight %
w/w	Weight per weight
Yr	Year

CONTRIBUTORS

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