

Energy Resources of Australia Ltd

Land Use Stewardship Summary

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Definitions

Acronym	Description
ERA	Energy Resources Australia
HSE MS	Health Safety Environment Management System
ERs	Environmental Requirements
GAC	Gundjeihmi Aboriginal Corporation
GIS	Geographical Information Systems
ITWC	Integrated Tailings Water and Closure
KNP	Kakadu National Park
LAA	Land Application Area
LDP	Land Disturbance Permit
MLN1	Mineral Lease North 1
MTC	Mining Technical Committee
NLC	Northern Land Council
RPA	Ranger Project Area
RP1	Retention Pond 1
RP5	Retention Pond 5
WQA	Weed Quarantine Area
WPA	Weed Protection Area
1YFMP	One Year Fire Management Plan
5YFMP	Five Year Fire Management Plan

1. Introduction

Energy Resources of Australia Ltd (ERA) owns and operates the Ranger uranium mine (Ranger mine). ERA mines uranium ore and produces drummed uranium oxide at its Ranger mine in Australia's Northern Territory.

Located 8 km east of Jabiru and 260 km east of Darwin, ERA's Ranger mine lies within the 79 km² Ranger Project Area (**Figure 1**). The Ranger Project Area is located on Aboriginal land, and surrounded by, but separate from, the World Heritage listed Kakadu National Park (KNP).



Figure 1. Ranger Project Area including Ranger mine and MLN1 Lease

Ranger commenced commercial production of drummed uranium oxide in 1981. Following completion of mining in the operating Pit 3 in November 2012, ERA has begun the transition from open cut mining to underground exploration of the Ranger 3 Deeps mineral resource. ERA sells its product to power utilities in Asia, Europe and North America under strict international and Australian Government safeguards and non-proliferation conditions to ensure that Australian uranium is only used for peaceful purposes. It maintains long term relationships with customers and meets their energy needs by providing consistent and reliable supply of uranium oxide

Conditions for operating at Ranger and MLN1 are set out in agreements entered into by the Northern Land Council on behalf of the Traditional Owners.

2. Scope

This Land Use Stewardship Summary (the Summary) applies to all personnel and work activities conducted under the direction of Energy Resources of Australia Ltd (ERA).

The Summary is applicable to all lands managed, owned or leased by ERA including and but not limited to the Ranger Project Area (RPA) and Mineral Lease North 1 (MLN1) (such as Jabiru township). The Summary is not the lead document for closure and post-closure relinquishment. The goal of the Integrated Tailings Water and Closure Pre-feasibility Study is to develop a fit for purpose Closure Strategy and a Closure Management Plan (with integrated tailings and water management plans).

ERA has a number of individual plans that relate to specific aspects of land management, and the Rio Tinto Health Safety Environment and Quality Management System provides an overarching roadmap for the coordination and strategic management of effort embedded in these management plans.

3. Purpose

Under the overarching framework of the ERA Health Safety and Environment Management System (HSE MS), the Summary has been developed as a roadmap for the coordination and strategic management of effort across a number of specific land stewardship aspects.

Several hazards pertaining to land use stewardship have been identified including: land disturbance, weed infestation, uncontrolled fire and damage to cultural heritage artefacts/sites.

The Summary and supporting documents describe some of the key risks and opportunities in land use stewardship for ERA and as such are continually evolving.

4. Planning

ERA's temporary use of the land on which the Ranger and MLN1 leases are located is recognised as being a single stage in a cycle of multiple and sequential land use. In accordance with the Authorisation, Ranger mine is to be rehabilitated such that it can be incorporated back into the surrounding Kakadu National Park. Land use classifications are employed by ERA to effectively manage areas of land with specific management aims or uses. The land use classifications reflect the often differing needs in respect of land use planning and decision making for the land that ERA is accountable for stewarding.

4.1 Health Safety and Environment Policies

The ERA Health & Safety Policy and Environment Policy apply to all works conducted at ERA. Contractor policies are considered subordinate to the ERA policies and must not contradict the objectives of the ERA policies. The policies are communicated to all employees, contractors and stakeholders during induction and are displayed publically around the site.

The objective of ERA's Environmental Policy is to ensure environmental harm resulting from ERA's activities is minimised and does not compromise future land uses.

The Environmental Policy outlines the responsibilities of employees and contractors to ensure environmental harm is minimised and how the Environmental Policy will be implemented. The ERA Health & Safety and Environment Policies can be viewed online through the link below:

<http://www.energyres.com.au/ourapproach/2487.asp>

4.2 Legal and other requirements

ERA's operations are governed by Commonwealth and Territory legislation and various approvals, licensing arrangements and agreements. These are comprehensively detailed in ERA's Compliance Obligations Register. The identification of legal requirements, the maintenance of legal information and the means by which employees seek legal information is detailed in documented and approved ERA procedures.

ERA has an Authority (commonly referred to as the s.41 Authority) under the *Atomic Energy Act* to mine, recover, treat and process uranium oxide at Ranger mine. Under this Authority, ERA is required to comply with environmental requirements and to comply with the Government Agreement, Complementary Agreement and Mining Agreement.

The primary objectives of the environmental requirements relate to environmental protection and rehabilitation. The environmental requirements state that present and future activities at Ranger must not impact upon the values, attributes and ecosystem health of Kakadu National Park nor the health of the regional community. The requirement that the site be rehabilitated to establish an environment such that it could be incorporated into Kakadu National Park is stated in the environmental requirements.

The Northern Territory Government issues an Authorisation for the site under the *Mining Management Act*. This sets out a range of conditions under nine schedules relating to

specific aspects of ERAs operations at Ranger. Monitoring and reporting requirements are stipulated in three annexes to the Authorisation. A separate Authorisation is issued for Jabiluka (MLN1).

All cultural heritage, whether sites or objects of significance on the RPA and MLN1, are protected under both Federal and Territory legislation. In the NT the following Acts and organisations apply:

- *Northern Territory Heritage Conservation Act*
- *Northern Territory Aboriginal Sacred Sites Act*
- *Aboriginal Areas Protection Authority*

4.3 Standards for land use management

The standards and guidance applied to land use management are:

- AS/NZ ISO14001:2004 Environmental Management Systems
- Rio Tinto HSEQ Management System
- Rio Tinto – The Way We Work
- Rio Tinto Biodiversity Strategy
- Rio Tinto Closure Strategy
- Rio Tinto Environment Standard E9 – Land Use Stewardship
- ERA Environment Policy
- Ranger & MLN1 Authorisations including Environmental Requirements
- Jabiluka Long Term Care and Maintenance Agreement
- ERA Cultural Heritage Management System

ERA's environmental performance relating to land management and biodiversity is required to be reported to Rio Tinto as part of the Social & Environment (S&E) Annual Survey.

4.4 HSE Management System

ERA's HSE MS is certified to the ISO14001:2004 and AS4801:2001 standards. The HSE MS conforms to the Rio Tinto Health, Safety, Environment and Quality Management System and Health, Safety and Environment Performance Standards.

This Land Use Stewardship Summary is one element of ERA's HSE MS and is designed to comply with Rio Tinto's E9 Land Use Management Environmental Performance Standard.

4.5 Performance Criteria

Where relevant, performance criteria may be assigned in detail in the specific management plans; this Summary is intended to be a higher level document providing a roadmap to the more specific land use environmental aspects.

Statements for performance criteria are specific and measurable, and based on the objectives and targets. They are designed to be used during the review phase of a program/project to assess performance in different phases/areas within a program.

5. Surrounding Land Uses

5.1 Conservation, Tourism and Research

The RPA and MLN1 are separate from, but surrounded by Kakadu National Park. Covering an area of almost 20,000km², Kakadu National Park has been listed as a World Heritage Area against the following cultural and natural criteria:

- Represent a unique artistic achievement, a masterpiece of creative genius;
- Be directly or tangibly associated with ideas of beliefs of outstanding universal significance;
- Outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment;
- Unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty; and
- The most important and significant habitats where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive.

Kakadu National Park is managed by Parks Australia who aims to respect the interests of Aboriginal Traditional Owners, conserve the natural and cultural heritage of the park, and encourage visitors to appreciate, enjoy and understand the park. For the purposes of management, Kakadu is assigned to the International Union for Conservation of Nature protected area category 'national park' and is managed in accordance with the management principles provided for in the Environment Protection and Biodiversity Conservation (EPBC) Regulations. The region is also used for conducting environmental research. In particular, the Environmental Research Institute of the Supervising Scientist conducts research into the environmental impact of uranium mining in the region and the environmental protection of wetlands in the Alligator Rivers Region.

5.2 Aboriginal Traditional Uses

Traditional Owners maintain a responsibility to care for country and to continue their close association with the land. Areas surrounding the leases may be used for a number of activities including recreation, hunting, foraging and collecting materials for a range of purposes. In 2007 ERA, the GAC and Traditional Owners worked actively together to implement an initiative to improve access to the RPA for cultural activities.

5.3 Nearby Communities

ERA has played a key role in the physical, economic and social development of the town of Jabiru and the Northern Territory. ERA is the major employer in the area and its workforce, contractors and dependents account for at least half of the town's population. ERA is also the major customer to a number of local businesses, the principle source of revenues for the town administration, and a major sponsor of many community-wide events and activities. ERA aims to secure and maintain community support and endorsement for ERA activities within the region, and to achieve this has initiatives relating to employment, training, communication and consultation.

5.3.1 Local Partnerships

ERA is engaged with its key stakeholders working towards developing a social licence to operate at Ranger. A large number of projects and joint ventures are focused on land use management and ongoing stewardship of the land. A recent significant milestone was the execution of a suite of agreements covering the RPA by Energy Resources of Australia Ltd, Mirarr Traditional Owners, the NLC, and the Commonwealth Government. One of those agreements (Ranger Uranium Mining Project Mining Agreement) details ERAs legal obligations to the land owners and includes clauses related to land protection, rehabilitation, environmental protection and performance, traditional owner access and engagement.

Some examples of ERAs engagement with local organisations include:

- The Education Partnership
- The Independent Surface Water Working Group
- As a joint venture with local Indigenous businesses and associations, development of a revegetation workforce with the objective of training local people to conduct land management work post-closure of Ranger
- Ongoing liaison with GAC on cultural heritage matters relating to operations and closure, including the development of cultural closure criteria
- Conduct of a regional social impact assessment. Consultation will occur with Traditional Owners and wider community members. A community consultation plan is also planned for development.
- Development of a long term view for Jabiru, in conjunction with traditional owners, Government agencies and departments and other stakeholders.

5.4 Land Zoning

ERA's owned and managed lands within the Northern Territory are subject to *The Planning Act*, which provides for appropriate and orderly planning and control of the use and development of land. The Planning Act provides for a consolidated (Northern Territory-wide) planning scheme and for the specific planning scheme of the Jabiru Town Plan. These schemes include provisions that permit, prohibit or impose conditions on a use or development of land according to zoning. Under the *Northern Territory Planning Scheme* there are 33 specific Zones, in the categories of Residential, Commercial, Industrial, Recreation, Rural, Other and Infrastructure. Under the Jabiru Town Plan there are eight Zones, which are Residential, Future Development, Town Centre, Service Facilities, Light Industry, Open Space, Recreation and Special Purposes.

Tenure for the RPA and MLN1 are derived from relevant legislation, copies of which are stored on the ERA servers. Some activities may require specific government approvals. Approved proposals define (and constrain) the work that can be carried out as part of the operation.

6. Location

6.1 Regional Characteristics

The region has a wet-dry tropical climate characterised by distinctly seasonal rainfall. Topographically the site is situated within an extensive landscape of broad shallow valleys, long low-angle slopes and isolated hills. Prior to site development the Ranger mine area was covered with an open eucalypt forest, billabongs and ephemeral creeks in common with much of the Alligator Rivers Region.

The surrounding Kakadu National Park contains over one third of Australia's bird species (271), one quarter of Australia's land mammals (77), 132 reptile species, 27 frog species, and over 246 fish species recorded in tidal and freshwater areas (DNP, 2007). The Park also contains 39 migratory bird species that are listed under the Bonn Convention, 52 bird species listed under the China-Australia Migratory Bird Agreement, and 49 bird species listed under the Japan-Australia Migratory Bird Agreement (DNP, 2007).

Since the 1990s, a significant decline has been recorded in the abundance of 10 species of small mammals in the park, including the *Northern Territory Parks and Wildlife Conservation Act* listed fawn antechinus (*Antechinus bellus*) and pale fieldrat (*Rattus tunneyi*), and the EPBC Act listed northern quoll (*Dasyurus hallucatus*), northern brown bandicoot (*Isoodon macrourus*), common brushtail possum (*Trichosurus vulpecula*) (Woinarski et al., 2010). The decline has been attributed to a high fire frequency, feral cats, and cane toads (Woinarski et al., 2010).

The broad plant communities that occur on the Ranger are open forest, woodland, savannah/mixed shrub-land, and paperbark forest. The fauna on the RPA is diverse and comprises a number of migratory species (Commonwealth) and species of conservation significance (NT and Commonwealth). For example, threatened species such as the fawn antechinus (*A. bellus*); eastern partridge pigeon (*Geophaps smithii smithii*); and, Mertens' water monitor (*Varanus mertensi*) have been frequently recorded on the RPA. **Figure 2** shows the locations of listed fauna species of conservation significance found on the RPA during surveys undertaken from 1998 – 2013, inclusive.

Brady *et al.*, (2007), described the broad vegetation classes on the MLN1 as including: floodplain and lowland wetlands; lowland rainforest and riparian; sandstone outlier; and, woodland. The sandstone habitat is of particular conservation significance as it is of limited extent (namely the Arnhem Plateau Sandstone Shrubland Complex); is noted for its ecologically sensitive sandstone heathland communities (Environment Australia, 2009); and contains a large number of endemic species. It is very complex topographically, containing deep and extensive gorges, large areas of sandstone platforms and rock piles. This provides a diverse array of microclimates and in addition, the rugged gorges and sheer escarpments provided some protection from fire. This provides shelter for many fire-sensitive plants and animals.

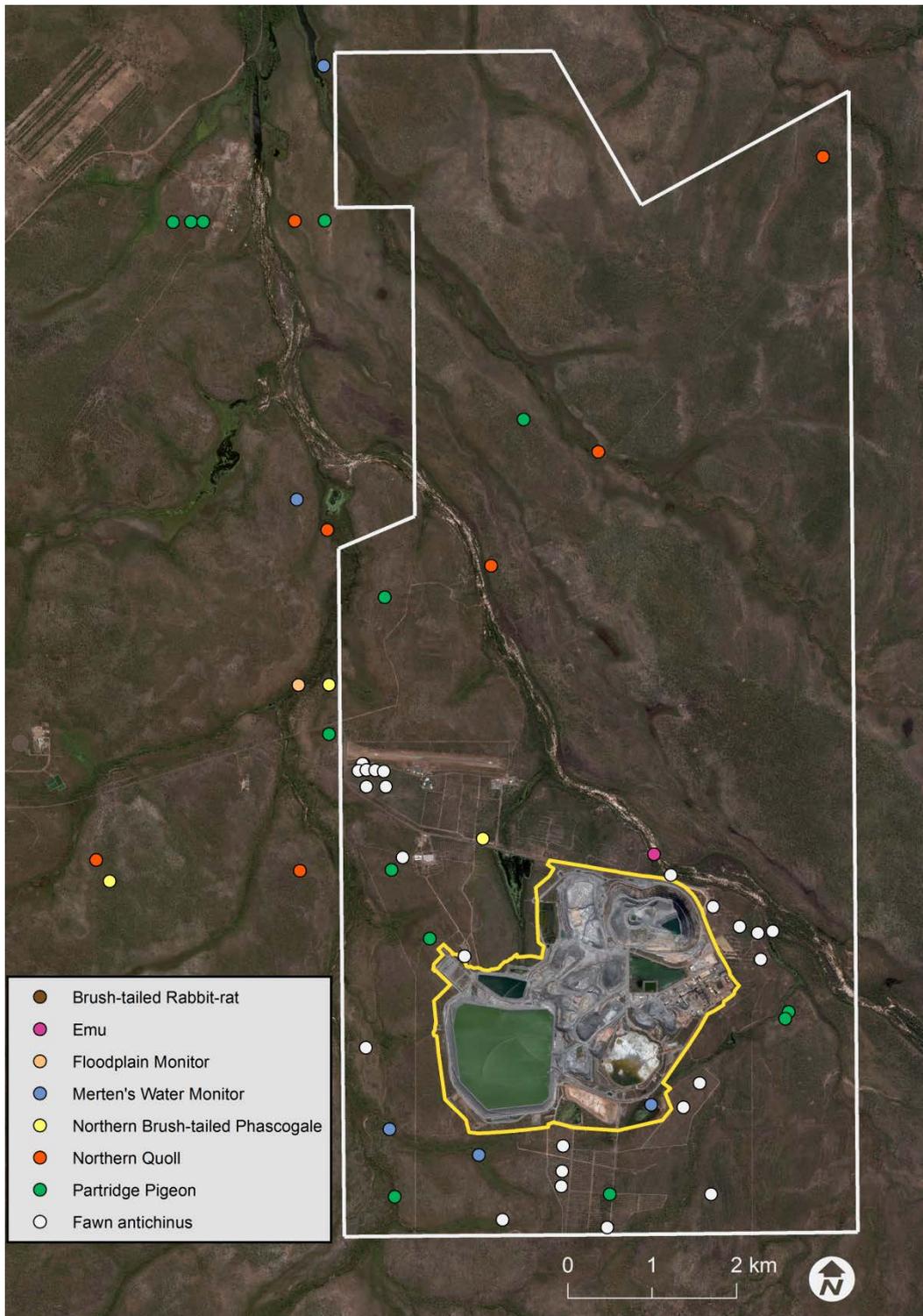


Figure 2: Listed fauna species of conservation significance on the RPA (surveys 1998 – 2013)

6.2 Local and Regional Biodiversity

ERA must comply with legal obligations related to protection of the environment, including conditions in the Ranger Authorisation and Jabiluka Authorisation. The main Northern Territory legislation relating to biodiversity is the *Territory Parks and Wildlife Conservation Act 2000* (TPWC Act) and the main piece of Commonwealth legislation is the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Under the TPWC Act, species that have been classified as Extinct in the Wild, Critically Endangered, Endangered or Vulnerable are considered to be threatened wildlife and are automatically

given protected wildlife status. The EPBC Act provides for the listing and classification of nationally threatened native species and ecological communities, and also lists protected migratory species.

The area in which ERA operates is internationally recognised for having unique ecosystems, high biodiversity, and significant natural and cultural heritage values. The RPA and MLN1 are surrounded by, but separate from the World Heritage listed Kakadu National Park (KNP). KNP contains 271 bird species, 77 mammal species, 132 reptile species, 27 frog species, over 246 fish species, and over 1500 plant species. Of the species contained within KNP, 17 plant and 32 animal species were listed as threatened under either the TPWC or EPBC Act as of 2007 (Director of National Parks 2007).

The biodiversity features present on the RPA and MLN1 have been identified by baseline and monitoring flora and fauna surveys undertaken over the last three decades. The reports from these surveys can be referred to for information about what ecosystems and species are present on the RPA and MLN1.

Approximately half of the habitat on the RPA is undisturbed, while the majority of the habitat in the MLN1 is undisturbed. The vegetation of the RPA and MLN1 is divided into four broad habitat types:

- Sandstone - includes all vegetation growing on the Arnhem Land sandstone and associated outliers
- Lowland riparian & rainforest - the denser vegetation of the lowlands associated with permanent water
- Floodplain & lowland wetlands - areas that are seasonally inundated
- Woodland - lowland areas dominated by trees

Only the Lowland riparian & rainforest and the Woodland habitats are found on the RPA, while all four habitat types are found on the MLN1. Based on likely use of the habitat by threatened species, the Sandstone habitat has the highest conservation value. Out of the four habitat types, the Sandstone and Lowland riparian & rainforest habitats have the greatest sensitivity to disturbance (Brady et al. 2007).

It is likely that within the Sandstone habitat of the MLN1 there is some of the Arnhem Plateau Sandstone Shrubland Complex, which is an ecological community that is listed as Endangered under the EPBC Act. The exact extent of the Arnhem Plateau Sandstone Shrubland Complex on the MLN1 is not known as there has been no fine-scale mapping, however it is likely to be present as a patch at least five hectares in size and containing four or more different obligate-seeder plants, and so to be protected under the EPBC Act.

A review of the existing literature of biodiversity on the RPA and MLN1 compiled lists of all the vertebrate fauna and vascular flora recorded. In total there have been 26 native amphibian, 192 native bird, 31 native fish, 53 native mammal, 76 native reptile, and 694 native vascular flora species recorded on the RPA and MLN1.

These species lists were checked against the TPBC Act and the EPBC Act. There are eight threatened mammals, four threatened birds, and five threatened reptiles that have been recorded on the RPA and MLN1. No threatened fish, amphibian, or plant species have been recorded on the RPA and MLN1. Eighteen species that are listed as migratory under the EPBC Act have also been recorded on the RPA and MLN1.

Of the seventeen threatened species that have been recorded on the RPA and MLN1, some were only sighted once, or were recorded long ago and have since undergone declines, and so may not currently be present on the RPA and MLN1. Threatened species which are likely to be currently present on the RPA and MLN1 are the:

- Arnhem Leaf-nosed Bat (*Hipposideros inornata*),
- Arnhem Rock-rat, (*Zyomys maini*),
- Fawn Antechinus (*Antechinus bellus*),
- Floodplain Monitor (*Varanus panoptes*),
- Merten's Water Monitor, (*Varanus mertensi*),
- Mitchell's Water Monitor (*Varanus mitchellii*),
- Pale Field-rat (*Rattus tunneyi*), and
- Partridge Pigeon (*Geophaps smithii*).

Biodiversity on the RPA, MLN1 and the surrounding region may be impacted by key threatening processes including impacts of exotic flora, impacts of exotic fauna (cane toads, cats and feral pigs), impacts of climate change, and changed fire regimes. An ecological risk assessment has found that non-mining risks occurring at the landscape-scale are several orders of magnitude greater than risks arising directly from ERAs operations. It is unlikely for ERAs operations to have a significant impact on any threatened species, migratory species or threatened community (Gellert 2014).

6.3 Former Land Uses

Following the discovery of the Ranger deposits, the Australian Government commissioned an inquiry into the future of uranium mining in Australia known as the Ranger Uranium Environmental Inquiry, chaired by Justice Fox. The Second Report of the Ranger Uranium Environmental Inquiry (Fox 1977) (herein referred to as the Fox Report) details former uses of the land Ranger currently occupies.

Continuing Aboriginal occupation in the Alligator Rivers Region is proven for at least 25000 years, possibly as long as 50000 years. The number of cultural heritage sites recorded across the RPA show that this area was occupied by local populations for a range of uses.

The Fox Report outlines that buffalo hunting for both hides and meat occurred in the Region throughout the early to mid-20th century, with meat processing facilities established at Mudginberri and Oenpelli. Pastoral leases were held over large areas of land within the Alligator Rivers Region.

Commercial and recreational fishing has been undertaken in the Regions' rivers for an extensive period of time.

The region has also been explored and mined for a range of minerals. The South Alligator Valley was explored and mined for uranium in the 1950s and 60s. Other activities such as small scale sawmilling and tourism ventures operated in the region throughout the early 20th century.

Among the principal recommendations of the Ranger Uranium Environmental Inquiry was that a major national park be established in the Region. Kakadu National Park was declared in 1979 and Stage 1 was inscribed on the World Heritage List in 1981. Stages 2 and 3 were also inscribed on the World Heritage List in 1987 and 1992 respectively.

6.4 Current Land Uses

6.4.1 Ranger Project Area (RPA)

The RPA is located approximately 260 km east of Darwin in the Alligator Rivers Region of the Northern Territory. It is surrounded by Kakadu on all sides except to the north where it abuts MLN1. Access to the RPA is via gazetted roads.

The RPA covers approximately 7900 ha of which a large portion remains undisturbed. The operational area of the lease contains infrastructure including open cut pits, the processing plant, tailings storage facilities, land application areas and the airport (**Figure 3**). ERA also maintains a workers accommodation camp on the lease for staff and contractors. Other facilities located on the RPA not directly managed by ERA include government buildings (the Environmental Research Institute of the Supervising Scientist), charter airlines and associated infrastructure and a local native plant nursery.

The Mirarr people are the traditional land owners of the land on which the RPA is located. There are several major cultural sites located immediately adjacent to the RPA, with the Mt Brockman site in particular having special significance to local and regional groups. ERA has been advised by the Aboriginal Areas Protection Authority that whilst there are no registered sites on the RPA there are significant sites including a recorded rock art site, a grinding site, a cemetery and numerous artefact scatters.

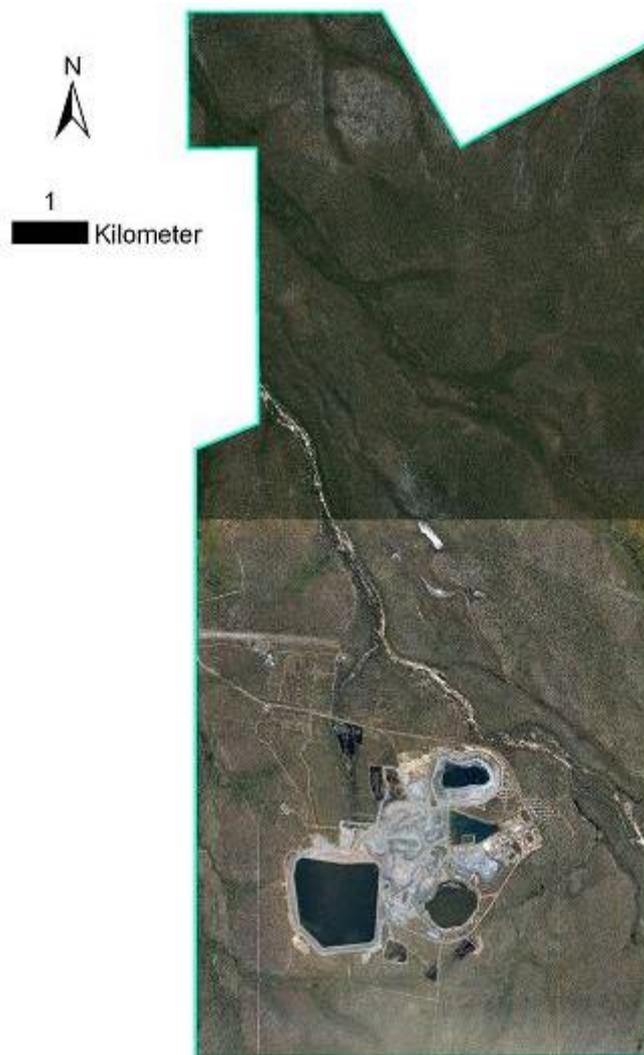


Figure 3: Ranger Project Area

6.4.2 Mineral Lease North (MLN1)

ERA holds the mining title to the MLN1, which covers 7282 ha and is to the immediate north of the RPA. The lease is defined in First Schedule to the MLN1 as issued by the Northern Territory Government.

MLN1 is managed under a long term care and maintenance regime outlined in an agreement between ERA, the Gundjeihmi Aboriginal Corporation (GAC) (representing the Traditional Owners) and the Northern Land Council (NLC). ERA has an ongoing commitment to the Jabiluka Project but will not develop it without the support of the Traditional Owners.

The majority of the lease is relatively undisturbed and it adjoins Kakadu to the west, north and east. The main areas of disturbance occurs around the Jabiluka decline portal area and the former exploration camp at Djarr Djarr. A number of un-planned and high intensity fires have impacted on the success of revegetation at Djarr Djarr. The footprint of the Jabiluka site is small with rehabilitation footprint associated with the current long-term care & maintenance phase restricted to about 13.2 ha (i.e. 0.2% of the lease area).

MLN1 has many sites of Aboriginal cultural value, including sacred sites, sites of significance, art sites and dreaming tracks/routes. Within MLN1 two distinct areas have

been designated as Australian Heritage Commission areas and are controlled by the Australian Government (**Figure 4**).

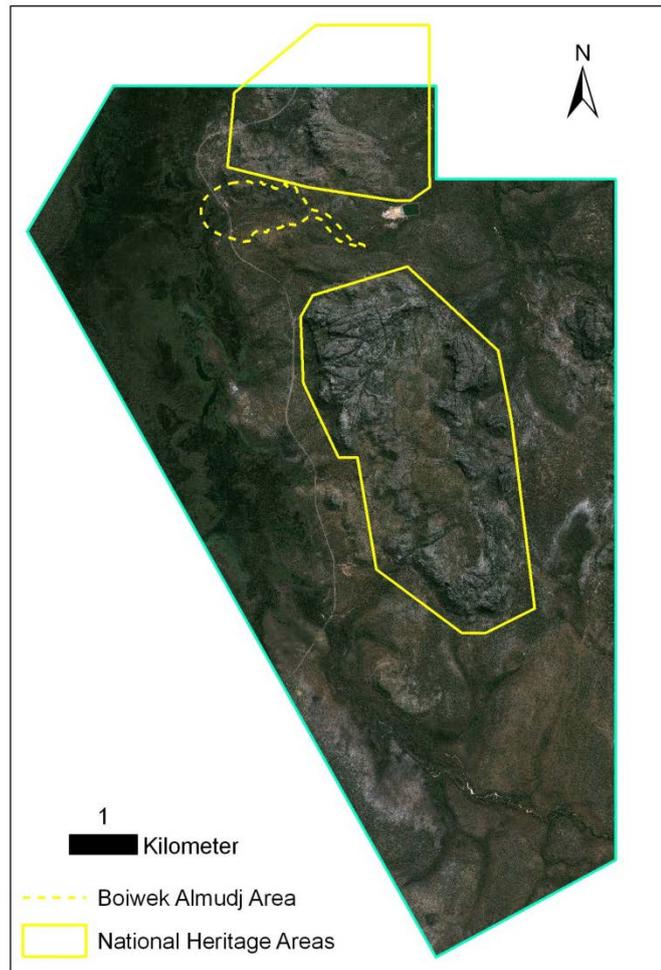


Figure 4: The MLN1 showing the two areas listed by the Australian Heritage Commission and the Boiwek Almudj complex of sacred sites

6.4.3 Jabiru Township

The Jabiru town covers approximately 13 km² of land. The Commonwealth, through the Director of National Parks and Wildlife, holds the title to this land. In 2010 the town site was awarded a Native Title Claim, as lodged by the Mirarr under the Commonwealth Native Title Act (**Figure 5**).



Figure 5: Jabiru Township

The Jabiru Town Development Authority holds the head lease to the town site and has governance, fiscal and management responsibilities for Jabiru. The head lease overlies Kakadu National Park. The Jabiru Town Development Authority is a co-management and controlling arrangement involving the Northern Territory Local Government Authority and ERA. The Jabiru Town Development Authority lease is due to expire in 2021 but there is provision to extend the lease for a further forty years. ERA subleases individual parcels of land within Jabiru.

The Jabiru Town Plan (administered by the West Arnhem Shire Council) imposes limitations and restrictions on the types of construction, services and businesses that can be carried out in Jabiru and also on the maximum population. The town accommodates a number of important public service functions (educational, health, social services), supports a number of tourism operators, and is home to the administrative centre of Kakadu.

6.5 Future Land Uses

In accordance with the Ranger Authorisation, Jabiluka Authorisation, and Environmental Requirements, ERA is required to rehabilitate the RPA and MLN1 to establish an environment similar to the adjacent areas of Kakadu such that the rehabilitated area could

be incorporated into Kakadu National Park. Rehabilitation and closure of the RPA and MLN1 is discussed in more detail in **section 14**.

The current conditions of the Jabiru Head Lease require ERA to rehabilitate the land it subleases in Jabiru to a condition as similar as possible to the surrounding KNP. Any variation to this obligation would require the agreement of the Commonwealth through the Director of National Parks and Wildlife and the Northern Territory through the Jabiru Town Development Authority.

6.6 ERA's Land Use Classifications

ERA's land use classifications allow ERA to appropriately manage areas of its land that have different management aims by defining the particular management actions for each area. They are primarily based on the area's level of disturbance and the types of activities that are undertaken on the land. Current land use classifications are:

- Operational;
- Infrastructure;
- Land application areas;
- Undisturbed;
- MLN1; and
- Other.

Any proposed land disturbance to an area in the RPA and MLN1 requires the application for and approval of a Land Disturbance Permit (LDP). Land Disturbance Permits are not required for disturbance or excavation at Pit 1, Pit 3, the tailings dam, waste rock dumps, the run of mine pad, mine stockpiles and excavation of a concreted, bitumen or asphalt road, pad or hardstand. Planned fires are required to be approved via a Land Disturbance Permit.

6.7 Description of Classifications

6.7.1 Operational

Operational land on the RPA is highly disturbed and is defined as that inside the fenced area of the Ranger mine (**Figure 6**). This land includes Pits 1 & 3, the tailings dam, stockpiles, retention ponds 2, 3 and 6 and the footprint of retention pond 5, processing plant, administration buildings and roads. Cultural heritage clearance is not required for land disturbing activities within this footprint. Operational land also includes the landfill and waste disposal facilities.

The Operational land on the RPA also includes some areas of protected vegetation. Information on the exact areas, their location and size is included as a layer in the Cultural Heritage GIS.

Changes to land use and new land disturbance in this area can require different levels of approval, ranging from Mining Technical Committee through to approval of a land disturbance permit. Land management activities in this area include weed spraying and vegetation maintenance.



Figure 6: Ranger operational area (green shading)

6.7.2 Land Application Areas (LAAs)

Land application areas are areas where polished waters are irrigated to maximise evapotranspiration loss, minimise surface pooling and seepage as well as preventing surface run-off during operations. Polished waters may include water treatment plant permeate, wetland filtered polished waters, and RP1 managed release waters, provided the latter are of no lesser quality than that of average wetland-polished waters. The locations and management of land application areas can be found in the annually updated ERA Ranger Water Management Plan.

This land is actively managed through weed spraying, and maintaining vegetation (through mowing / slashing) along the irrigation lines. Fire breaks are maintained for asset

protection and low intensity burns are sometimes used to reduce fuel loads. No other land use occurs in the active land application areas.

Former land application areas (Magela Land Application Area A & B) have been decommissioned and the majority of irrigation infrastructure removed from the area. These areas have been a focus for exploration campaigns and more recently have been subject to rehabilitation trials. Trial revegetation areas may be re-disturbed where such disturbance has reasonable justification. Exploration campaigns are considered a temporary land use within this land classification area.

During the September 2013 flora and fauna survey, the NT listed fawn antechinus (*A. bellus*) was recorded in the Magela LAA, corresponding to previous survey recordings (**Figure 3**). The fawn antechinus is the only species of *Antechinus* found in the savannah woodland and tall open forest of the Top End of the NT (Watson and Calaby, 2008). The species is restricted to the NT, largely to the mainland but there is one record of the species from the Tiwi Islands. The species has been declining in the NT over the past decade due to ongoing inappropriate fire regimes affecting habitat suitability, and predation by feral cats (Woinarski et al., 2010).

6.7.3 Infrastructure

This is land which is disturbed and contains infrastructure which supports either the Ranger operations or the Jabiru township. It may be within or outside of the Ranger and MLN1 leases. It generally is less disturbed than the Operational zone but may still require significant effort for rehabilitation. It currently includes the Ranger Mine Village and the Jabiru Airport, both of which are situated on the RPA. The Ranger Mine Village is a temporary establishment comprised of transportable dongas, kitchen and laundry facilities and septic trenches.

Land management activities in these areas include weed spraying, erosion control and vegetation maintenance. Land immediately surrounding these areas is subject to planned fire for asset protection, weed management and overall ecological benefit.

6.7.4 MLN1

MLN1 is largely undisturbed with the main areas of disturbance around the Jabiluka decline portal area and the former exploration camp at Djarr Djarr. The lease is currently managed under a long term care and maintenance agreement. Disturbed areas on the lease have been subject to rehabilitation and revegetation efforts since the long term care & maintenance agreement commenced.

ERA has entered into an agreement with the Traditional Owners that it will not develop the Jabiluka deposit or any other mineral deposit on the lease without first obtaining the consent of the Traditional Owners to that development. The majority of rehabilitation works carried out and planned for MLN1 is subject to approval of the Jabiluka Minesite Technical Committee of which the Northern Land Council and GAC are members.

6.7.5 Undisturbed

The majority of the RPA remains largely undisturbed. Such areas include north of Magela Creek and the south west and south east corners of the RPA. These areas may have historic or current tracks, are primarily used for exploration and water management purposes and require varying levels of weed management. Some areas to the north of Magela Creek have been subjected to exploration campaigns following cultural heritage clearance for the applicable area. There are limited access tracks in this area. Planned

burns are conducted in these areas for asset protection and fuel reduction purposes, and where practicable, consideration is given to fire schedules to minimise potential adverse impact to habitat quality, resulting in habitat modification and/or lifecycle disruption to threatened species (e.g. *A. bellus*).

Exploration campaigns are considered a temporary land use within this land classification area. Risks to sustainable land use management, including closure and rehabilitation of drill sites are controlled via the Exploration Management Plan and associated standard operating procedures.

The undisturbed land on the Ranger Project Area includes two areas of cultural heritage significance. These are the Magela Creek Conservation Zone and the un-surveyed area to the north of Magela Creek. Land disturbance is not permitted in the Magela Creek Conservation Zone. Any proposed land disturbance in the un-surveyed land to the north of Magela Creek will require consultation with the Cultural Heritage Specialist and limitations on disturbance prior to cultural heritage clearance in the proposed disturbance area. GIS layers of the Magela Creek Conservation Zone and the areas not surveyed are available in the Cultural Heritage GIS.

6.7.6 Other

ERA holds agreements with both private enterprise and government agencies to lease land on the Ranger Project Area. Currently there are two such agreements in place for land close to the Jabiru airport. These parcels of land are not directly managed by ERA.

Kakadu Native Plant Supplies operate a nursery for species indigenous to the local area. Kakadu Native Plant Supplies is a major supplier of seed and tubestock to ERA for revegetation projects. The land has established greenhouses and irrigation facilities.

The Environmental Research Institute of the Supervising Scientist (part of the Australian Government Supervising Scientist Division) operate the Jabiru Field Station. This land is occupied a number of buildings (offices and sheds) and environmental monitoring and research facilities.

7. Hazard Identification and Risk Management

7.1 Hazard Assessment

The following environmental aspects have been identified as key risks to land use stewardship at Ranger mine and have the potential to impact on ERA's reputation and responsibility for final closure rehabilitation. Controls and their implementation are discussed in section 8.

7.1.1 Land Disturbance

The operational mine site is considered a current disturbed area and hence the level of native vegetation and native fauna with the potential to be harmed is low. Any works (such as exploration) outside of the operational mine site yet within RPA are done so under strict procedures.

7.1.2 Weed Infestation

ERA has identified the spread of weeds through the lease and KNP as a high environmental risk in the ERA Risk Register. The management of this hazard involves many controls including weed spraying, taskforce training, machinery inspection, signage, standard operating procedures and washing of tools and equipment.

The spread of weeds throughout the RPA and MLN1 poses a risk to future site rehabilitation and closure requirements.

7.1.3 Uncontrolled Fire

Unplanned / wild and high intensity fires have the potential to damage mining infrastructure and cause harm to personnel, vegetation and adversely impact habitat quality, resulting in, for example, habitat modification and/or lifecycle disruptions to threatened species (e.g. *A. bellus*). Such fires may also harm revegetation works or encourage weed spread.

7.1.4 Disturbance of Cultural Heritage Artefacts/sites

ERA recognises the importance of the area (especially Mt. Brockman) to the Mirarr Traditional Owners and respecting indigenous heritage is one of ERA's highest values. ERA's strict land disturbance permitting procedure takes into account controls required to minimise any potential risk to cultural heritage sites.

8. Implementation and Operation

8.1 Implementation of Controls

For each of the identified key risks to environmental aspects of land ERA is stewarding, specific control methods have been identified. Through the successful implementation of these controls it is intended that the environmental aspects of land under ERA's control will be protected.

8.1.1 Controlling Land Disturbance

ERA has a permitting system in place to manage land disturbance to ensure threatening processes are managed at all times. This process is documented in EVP019 Land Disturbance Permit Procedure, and also permitted through F10139 Permit to Work. The application for the permit includes a description of the purpose of the proposed disturbance and a plan or map of the area.

The process of evaluating the application includes consideration of and alignment with cultural heritage management protocols, types of vegetation in the proposed work area, habitat and life-cycle disruption to threatened species (e.g. *A. bellus*) and the proposed nature of the disturbance work. Post-work inspections and recording of land disturbance data allows the tracking and assessment of disturbance. ERA maintains a record of all land disturbance permits issued.

Any ground disturbing activity must be approved by key personnel before commencement of works. The approval process is applied to ensure all risks to land stewardship objectives, including cultural heritage protection, have been identified and appropriate controls can be applied to the permit.

The Land Use Stewardship Summary is supported by a variety of tools, management plans and spatial data. GIS data is managed by different departments within ERA to support operational, monitoring and research needs. Spatial data is maintained on a range of aspects and areas of the RPA and MLN1, including but not limited to:

- Tenure, lease boundaries
- Weed distribution and weed management areas
- Fire frequency maps
- Surface water and groundwater information
- Heritage and cultural sites
- Aerial photography
- Topographic features
- Heritage surveys areas and exclusion zones (sites)
- Flora & fauna surveys boundaries and vegetation mapping
- Water catchment areas
- Environmental monitoring sites
- Cultural Heritage
- Contaminated sites, hazardous sites, landfill

8.1.2 Weed Management

As weeds and seeds have the potential to be easily transported into and out of Ranger mine weed clearance inspections have been identified as the control method to minimise this risk. ERA has a procedure in place to conduct such inspections and liaised with Parks Australia to ensure appropriate coverage of high risk equipment travelling to and from Ranger.

ERA vehicles, machinery, and equipment working in certain areas of the RPA pose the risk of spreading weeds from one area to another. Further specific controls have been implemented to ensure this risk is managed to as low as reasonably practical. As part of the system to managing weeds on the RPA, ERA has defined Weed Quarantine Areas (WQAs) and Weed Protection Areas (WPAs). WQAs have been identified as having a high weed infestation. The aim of management is to prevent weed infestations moving out of these areas. WPAs have been identified as having very low levels of weed presence. The aim of management is to prevent the spread of weeds out of the WQAs into the WPAs.

8.1.3 Integrated Fire Management

Since Ranger mine commenced operations in 1980, controlled fires have been utilised for asset protection (physical and human) through minimising the frequency and severity of wild and high intensity fires. As ERA moves towards progressive rehabilitation activities and eventual mine closure, fire management for cultural and environmental outcomes will assume an increasing higher priority.

The role of the 5-Year Fire Management Plan (5YFMP) is to provide the context and direction for the long-term management of fire by ERA. Associated with the 5YFMP are successive 1-Year Fire Management Plans (1YFMP), which provide detail on annual burn programs and other short term management targets. These annual plans will provide specific actions for the operations team that meet the objectives and targets of the 5YFMP and to align with the ERA HSE MS requirements.

8.1.4 Cultural Heritage Management

Not all of the cultural heritage sites on ERA land have yet been identified. Known heritage sites are clearly marked to avoid trespass and access restrictions are enforced. To prevent disturbance of cultural heritage a Land Disturbance Permitting system has been established which is required for any activity which may disturb the surface of the land outside of the operational mine area.

As part of this Land Disturbance Permit process, an ERA Cultural Heritage representative must be consulted and sign off that ERA has satisfied the requirements of the Traditional Owners and the Northern Territory Aboriginal Sacred Sites Act prior to commencing any ground disturbing activities including inspections of sites for areas of heritage (archaeological) significance.

ERA has established cultural heritage management protocols and a cultural heritage management system. Together this establishes a framework for the protection of cultural heritage and ensures sites of cultural heritage value are not adversely impacted by ERA operations.

9. Measuring and Monitoring

Monitoring information specific to each environmental aspect can be found in the respective management plan. Monitoring requirements can change over time due to the type and nature of operations and activities being conducted. Data can be collated in the geographic information system for further interpretation and future program planning. Land use information that is recorded can include:

- Land disturbance areas (ha);
- Land area rehabilitated (ha);
- Fire scar mapping;
- Weed management;
- Weed density (annual mapping); and
- Weed spray hours).
- Biennial fauna surveys, including a desktop assessment of habitat quality.

10. Contingencies and mitigation measures

In the event an environmental incident occurs, the person who discovers the incident is responsible to taking immediate action as required and report. The Manager - Health, Safety, Environment and Water will be contacted in the event of an environmental emergency, and attend if required.

All incidents involving land disturbance, weeds, fire, and cultural heritage items shall be reported as soon as practicable on the day of the event. The initial report shall be made verbally to the Environment Superintendent, and followed up with a documented record.

10.1 Investigation

An investigation shall be conducted to determine the cause of the incident and to determine if additional controls are required. The reporting and investigation process shall be conducted in accordance with documented and approved ERA procedures.

11. Closure and Rehabilitation

The overriding goal for rehabilitation is set out in the Ranger Authorisation and ERs:

The operator of the mine shall rehabilitate the Ranger project area to establish an environment similar to the adjacent areas of Kakadu National Park such that, in the opinion of the Commonwealth Minister with the advice of the Supervising Scientist, the rehabilitated area could be incorporated into Kakadu National Park.

With this as the overall closure objective, ERA is preparing to meet the legislated requirements for the planned closure date of operations at Ranger of January 2026. In 2012 ERA commissioned the Integrated Tailings Water and Closure (ITWC) pre-feasibility study. The goal of the ITWC pre-feasibility study is to develop a fit for purpose closure strategy and closure management plan that will support and enable compliance with ERAs environmental protection objectives as specified by the Ranger Environmental Requirements. The development of the closure strategy and closure management plan will be guided by relevant Rio Tinto / ERA policies and standards and the Ranger Environmental Requirements (ERs). Cultural Heritage is integrated into the Rio Tinto Closure Standards, ERA policies and the Ranger ERs.

Along with major stakeholders, ERA chairs the Closure Criteria Working Group which is a sub-committee of the Ranger Minesite Technical Committee (MTC). The derivation and agreement of closure criteria with all stakeholders is a key element for the successful closure and rehabilitation of the RPA. The Terms of Reference for the Ranger Closure Criteria Working Group outline the purpose of the working group along with the process and milestones for deriving and agreeing on closure criteria for the Ranger Project Area.

The disturbed areas of the MLN1 are also to be rehabilitated, and the objectives for decommissioning and rehabilitation are set out in the Environmental Requirements attached to the Jabiluka Authorisation.

Annual Amended Plans of Rehabilitation are developed each year for the RPA and MLN1. These site specific plans are to be implemented in the event of unforeseen cessation of operations. They review the costing for closure and specify a plan for the rehabilitation of the leases. The revised plans must be approved by the MTC each year.

12. Management of change

In the event of change to the Land Use Stewardship Summary design, methods or strategies, the ERA management of change system shall be followed in accordance with documented and approved ERA procedures.

A management of change may be triggered in the following instances (*this list is a guide only and a risk assessment should be conducted where any uncertainty exists as to whether a management of change is triggered*):

- A change is made to the land use classification of an area of land identified within this plan; or
- A new cultural heritage item is found outside of areas identified within this plan.

13. Reporting Protocols

13.1 Incidents

Reporting of and response to any environmental incident will be in accordance with ERA's incident and action management standards and guidelines. These documents have been developed to comply with the Northern Territory *Mining Management Act 2001*, the Ranger Authorisation and the ERA's HSE management system.

All environmental incidents that have an impact (for example spillage or leakage of material outside of a bund) are externally reported to stakeholders. Incidents that qualify as an 'environmental incident' or 'serious environmental incident' are reported in accordance with the Northern Territory Mining Management Act 2001 to the Chief Executive of the Department of Mines and Energy.

13.2 Annual Environmental Reports

Environmental reports are required annually for Ranger in accordance with the Authorisation. The reports detail environmental performance for the reporting period and status ongoing environmental management and also include updates on weed, fire management and rehabilitation activities.

13.3 Rio Tinto Social & Environment Survey

Each year, Rio Tinto collects data to support its internal and external reporting performance and in this case, environment risks. External reporting is critical to maintaining Rio Tinto's and ERA's reputation, while internal reporting is important in promoting improvement. Rio Tinto requires that ERA report land use via the web-based system, Social & Environment Survey which is available on the internal Rio Tinto network. The data provides the framework for the Rio Tinto annual and sustainable development reports. ERA provides data on:

- Total Land Holding (ha);
- Total Land Disturbed (ha);
- Total Rehabilitated Land (ha);
- Land Acquired (ha);
- Relinquished Land (ha); and
- Footprint (ha).

Not all land under ERA management is disturbed or intended for disturbance. The objective is to manage land use so that there is minimum disturbance, and for rehabilitation of disturbed areas to be undertaken as soon as practicable.

14. Audit and Review

Audits of this Summary, and subsequent supporting management plans and procedures against the Rio Tinto Standard E9 Land Use Stewardship, will be performed in accordance with the ERA Audit Schedule.

The Land Use Stewardship Summary will be reviewed as required by ERAs document review process. Reviews may be undertaken sooner in response to changed operational circumstances or a significant change in legal or other requirements.

Progressive amendments shall be made to the management plan as a result of continuous improvement processes.

15. Organisational Resources, Accountabilities and Responsibilities

Accountabilities are set out in **Table 1**. It is important to note that other accountabilities relevant to land management, such as weeds, land disturbance etc, are assigned in relevant plans and procedures.

Table 1 Accountabilities

Role / Title	Responsibility
General Manager - Operations	Provide reasonable resources and support necessary to enable the successful implementation of the Land use Stewardship Summary and achieve compliance with legal and other requirements including Rio Tinto Environmental Performance Standard E9 Land Use Stewardship;
General Manager – Technical & Major Studies	Integrate Land Use Management requirements into closure planning Potential legacy issues (monitor & plan contingency in Closure Plan)
Manager HSE & W	Advise ERA Managers on implementation and maintenance the requirements of the Land Use Stewardship Summary; Approve the Land Use Stewardship Management Plan; Approve ERA changes to Land Use Classification; Review and approve LDP's. Approve the Land use Stewardship Summary;
Department Managers	Ensure operation plans comply with the intent of ERA's land use stewardship requirements and in particular the Land Use Stewardship Summary;
Environmental Superintendent	Promote and support implementation of the Land use Stewardship Summary including supporting documentation; Advise and communicate to ERA employees and contractors on key land use stewardship and management aspects as required.
Supervisor Environment Support	Promote the Land Use Stewardship Summary within the business to ensure personnel have appropriate awareness; Ensure that the land disturbance management permit system is maintained and the process is properly managed; Review and approve LDP's.
Manager Ecology	Review and approve LDP's.
Cultural Heritage Specialist	Review and approve LDP's.
All ERA employees and contractors	Undertake activities in conformance with the Land Use Stewardship Summary and subordinate documentation.