



**ERA** Energy Resources of Australia Ltd

## **Chapter 4 Final Land Use and Closure Objectives**

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## 4 FINAL LAND USE AND CLOSURE OBJECTIVES

### 4.1 Final Land Use

Post-mining land use needs to be clearly articulated to allow the development of closure objectives, which are formalised into closure criteria. The ERs specify that the RPA needs to be returned to a state in which it could be incorporated in Kakadu National Park, which is listed under the World Heritage Convention for both cultural and natural values. Any decision on the actual incorporation of the site to Kakadu National Park will be made by the relevant authority and may not eventuate until sometime after closure. Therefore the use of the final landform by local Aboriginal people (on the condition that they are satisfied that the area is safe) is considered to be the most likely final land use - whether or not the area is formally incorporated into Kakadu National Park. A detailed consultation with traditional owners regarding their planned use of the site by has been conducted (Garde, 2015) and identified the following land uses:

- Customary harvesting of bush foods and medicine.
- Recreation.
- Land management activities.
- Cultural site visitation and ritual responsibilities.

Bush food and medicine collecting day trips often involve fishing in Magela Creek, and may also include shooting macropods, pigs, buffalo, water fowl (mostly magpie geese) and emus. In addition to day trips, extended seasonal camps are common when concentration of food resources (such as the late dry/early wet season increase in water fowl) would attract Aboriginal people from Jabiru to places including Georgetown Billabong, Coonjimba Billabong and the rehabilitated RP1 area and Magela Creek. These trips are dependent on the availability of transport (4WD vehicle), a firearm, seasonal access conditions (i.e. road not inundated) and the seasonal availability of the intended resource.

Recreational use of the rehabilitated site may include:

- Intergenerational knowledge transfer visits.
- Residential college and school trips.
- Camping trips along Magela Creek.
- Bushwalking trips along traditional walking routes.
- Weekend swimming and picnics.

Some Aboriginal people consulted said they would like young people to become familiar with certain cultural sites on the RPA post-rehabilitation. This may be facilitated via an organisation (e.g. Gundjeihmi Aboriginal Corporation) or through private trips.

Other Aboriginal people said they would consider camping at traditional or well-known camping places, including various billabongs along the Magela and associated tributaries. There is a history of long term residence at sites along the Magela (for example 009 camp), where Aboriginal people have spent some years in residence. The area at 009 on the Magela remains a popular recreational site where weekend visits are still popular. In recent years however, the increase in the crocodile population has meant that people are only swimming there in isolated waterholes that appear in the late dry season.

Once the RPA has been rehabilitated, there will need to be an ongoing program of monitoring and management in relation to criteria for closure. Chapter 11, outlines the monitoring program for the Ranger mine across the six closure themes. The program is preliminary, and it is expected that the monitoring parameters, locations and sampling frequency will be confirmed with the Supervising Authority and Commonwealth Minister prior to, or during decommissioning. Subsequent updates to the monitoring program will be incorporated into future iterations of the MCP (refer Chapter 11). In addition, key stakeholders are currently working through options to extend ERA's access to the RPA post 2026, in order to undertake minor rehabilitation works and ongoing monitoring.

In the early days of rehabilitation it is envisaged that indigenous rangers will make periodic visits to undertake assessment of the cultural criteria associated with closure of the Ranger mine which are detailed in this report. It is difficult to fix the frequency of these visits at this early stage; however notionally, annual visits would be a minimal requirement. Once vegetation has been re-established to maturity on the rehabilitated RPA the issue of fire management and monitoring of weeds will require regular visits to the site. It will take several years for vegetation to become established to the point where it would be considered necessary to reintroduce fire as a management tool on the rehabilitated area. When this does become a reality, fire management will require site visitation.

Aboriginal people in Jabiru and Kakadu are required to undertake certain rituals associated with the death of a family member and to undertake increase rituals at certain key sites, especially sacred sites which are totemic centres for particular natural species. The sacred sites on the RPA may be locations where such rituals might be carried out in the future as Aboriginal people attempt to reconnect with the rehabilitated land. Aboriginal people can also visit sites to introduce new visitors or young people to important places. They may also wish to communicate with the spirits of deceased kin who are thought to inhabit certain sites. Table 4-1 provides possible visitation purpose and frequency of the RPA.

Table 4-1: Visitation purpose and frequency

Purpose of visit	Estimate of time
Hunting and food gathering (day trips)	30 days per person per year
Seasonal camping (extended camping)	20 days per person per year
Recreation	10 days per person per year
Land management and monitoring	10 days per person per year
Ritual	5 days per year

## 4.2 Culturally Important Flora and Fauna

Garde (2015) describes the importance of flora to the Mirarr based on linguistic reference and resource value, across three ecological zones of the RPA (water courses and billabongs, riparian margins and savanna woodland). The composition of plants identified in the report results in a total of 64 flora species, this list has been taken into account in development of the revegetation species list (refer Chapter 7, Section 7.6.3).

## 4.3 Closure Objectives

As outlined previously, the closure objectives for the Ranger mine are contained in the ERs which are appended to the s.41 Authority and the Ranger Authorisation. The closure objectives are the statutory requirements for mine closure and form the basis for the closure criteria as a means of measuring achievement of the closure objectives. Table 4-2 presents the closure objectives for each of the closure themes and cultural closure objectives, and Chapter 6 provides the closure criteria.

Table 4-2: Closure objectives

Objective	ERs
<b>Landform</b>	
Where all the major stakeholders agree, a facility connected with Ranger may remain in the Ranger Project Area following the termination of the Authority, provided that adequate provision is made for eventual rehabilitation of the affected area consistent with principles for rehabilitation	2.3
By the end of operations all tailings must be placed in the mined out pits.	11.2
the tailings are physically isolated from the environment for at least 10,000 years	11.3 (i)
Erosion characteristics of the rehabilitated landform, as far as can reasonably be achieved, do not vary significantly from comparable landforms in surrounding undisturbed areas.	2.2 (c)
<b>Radiation</b>	
Stable radiological conditions on areas impacted by mining so that, the health risk to members of the public, including traditional owners, is as low as reasonably achievable; members of the public do not receive a radiation dose which exceeds applicable limits recommended by the most recently published and relevant Australian standards, codes of practice, and guidelines; and there is a minimum of restrictions on the use of the area	2.2 (b) and 11.3 (iii)
In particular, the company must ensure that operations at Ranger do not result in:  (d) change to biodiversity, or impairment of ecosystem health, outside of the Ranger Project Area. Such change is to be different and detrimental from that expected from natural biophysical or biological processes operating in the Alligator Rivers Region; and  (e) environmental impacts within the Ranger Project Area which are not as low as reasonably achievable, during mining excavation, mineral processing, and subsequently during and after rehabilitation.	1.2 (d, e)



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Objective	ERs
<b>Water and sediment</b>	
<p>The company must not allow either surface or ground waters arising or discharged from the Ranger Project Area during its operation, or during or following rehabilitation, to compromise the achievement of the primary environmental objectives.</p> <p>The company must ensure that operations at Ranger are undertaken in such a way as to be consistent with the following primary environmental objectives:</p> <p>(c) Protect the health of Aboriginals and other members of the regional community</p> <p>The company must ensure that operations at Ranger do not result in:</p> <p>(c) An adverse effect on the health of Aboriginals and other members of the regional community by ensuring that exposure to radiation and chemical pollutants is as low as reasonably achievable and conforms with relevant Australian law, and in particular, in relation to radiological exposure, complies with the most recently published and relevant Australian standards, codes of practice, and guidelines.</p>	3.1, 1.1(c) and 1.2 (c)
<p>The company must not allow either surface or ground waters arising or discharged from the Ranger Project Area during its operation, or during or following rehabilitation, to compromise the achievement of the primary environmental objectives.</p> <p>The company must ensure that operations at Ranger do not result in:</p> <p>(d) change to biodiversity, or impairment of ecosystem health, outside of the Ranger Project Area. Such change is to be different and detrimental from that expected from natural biophysical or biological processes operating in the Alligator Rivers Region.</p>	3.1 and 1.2(d)
<p>The company must not allow either surface or ground waters arising or discharged from the Ranger Project Area during its operation, or during or following rehabilitation, to compromise the achievement of the primary environmental objectives.</p> <p>The company must ensure that operations at Ranger do not result in:</p> <p>(e) environmental impacts within the Ranger Project Area which are not as low as reasonably achievable, during mining excavation, mineral processing, and subsequently during and after rehabilitation.</p>	3.1 and 1.2(e)
<p>Final disposal of tailings must be undertaken, to the satisfaction of the Minister with the advice of the Supervising Scientist on the basis of best available modelling, in such a way as to ensure that:</p> <p>ii. any contaminants arising from the tailings will not result in any detrimental environmental impacts for at least 10,000 years.</p>	11.3 (ii)
<b>Flora and fauna</b>	
<p>Revegetation of the disturbed sites of the Ranger Project Area using local native plant species similar in density and abundance to those existing in adjacent areas of Kakadu National Park, to form an ecosystem the long term viability of which would not require a maintenance regime significantly different from that appropriate to adjacent areas of the park</p>	2 (a)
<b>Soil</b>	
<p>The company must ensure that operations at Ranger do not result in:</p>	1.2 (e)



Objective	ERs
(e) environmental impacts within the Ranger Project Area which are not as low as reasonably achievable, during mining excavation, mineral processing, and subsequently during and after rehabilitation.	
<b>Cultural</b>	
<p>The company must ensure that operations at Ranger are undertaken in such a way as to be consistent with the following primary environmental objectives:</p> <p>(a) maintain the attributes for which Kakadu National Park was inscribed on the World Heritage list<sup>1</sup>;  the company must 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 Minister with the advice of the Supervising Scientist, the rehabilitated area could be incorporated into the Kakadu National Park.</p>	1.1 (a) and 2.1
<p><sup>1</sup> World heritage values:  <i>Criterion (i): Represent a masterpiece of human creative genius.</i>  <i>Criterion (vi): Directly or tangibly associated with events or living traditions, with ideas, or beliefs, with artistic and literary works of outstanding universal significance.</i></p>	



#### 4.4 References

Garde, M. 2015. *Closure Criteria Development - Cultural. ERA Ranger Integrated Tailings, Water & Closure. Confidential report*, Northern Territory. April 2015, p 160.