



**HEAP LEACH FACILITY
FOR
ENERGY RESOURCES OF AUSTRALIA LTD'S
RANGER URANIUM MINE**

ERA Responses to NRETAS NOI Guidelines

Criteria No	Description	Relevant sections and/or figures in the EPBC Referral
1	Proponent contact details	Name: Rob Atkinson Title: Chief Executive Organisation: Energy Resources of Australia Ltd ACN/ABN: 71 008 550 865 Postal address: GPO Box 2394, DARWIN NT 0801 Telephone: 08 8924 3500 Fax: 08 8924 3555 Email: newprojects@era.riotinto.com
Declaration: I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action. Signature: Date: 12 March 2009		
2	Person preparing referral information	Name: Dr A R Milnes Title: General Manager Environmental Strategy Organisation: Energy Resources of Australia Ltd Postal address: GPO Box 2394, DARWIN NT 0801 Telephone: 08 8947 5756 Fax: 08 8924 3555 Email: newprojects@era.riotinto.com
Declaration: I declare that the information contained in this form is, to my knowledge, true and not misleading. Signature: Date: 12 March 2009		
3	Location of proposal	Sections: 1.2 Latitude and Longitude 1.3 Locality 1.4 Size of the development footprint or work area 1.5 Street address of the site Figures: - Fig 1 ERA leases & Ranger mine in the Alligator Rivers Region of the Northern Territory in relation to geographic & geomorphic features of the landscape - Fig 2 Location of ERA leases in relation to Darwin, Kakadu National Park & Arnhem Land - Fig 3 Current operations showing approximate boundary of area of surface & subsurface disturbance



Criteria No	Description	Relevant sections and/or figures in the EPBC Referral
4	Description of the proposal, including attachments such as site designs and diagrams, etc	Section: 2 Detailed description of proposed action Figures: Fig 3 Current operations showing approximate boundary of area of surface & subsurface disturbance Fig 4 Provisional site layout – heap leach facility and ancillary infrastructure. Final layout to be developed during the EIA process.
5	Legislative consent and licensing	Sections: 2.3 Context, planning framework and state/local government requirements 2.3.1 Context of this referral 2.4 Environmental impact assessment under Commonwealth, state or territory legislation 3.3(j) Tenure of the action area (eg freehold, leasehold)
6	Site selection details and environmental factors	Section: 3 Description of environment & likely impacts 3.3 Other important features of the environment Figures: Fig 5 Recent biodiversity survey locations on ERA's Ranger and Jabiluka leases Fig 6 Recordings of listed species of conservation significance on the Ranger and Jabiluka leases Fig 7 Broad-scale geology (BMR interpretation, 1980) Fig 8 Pre-mining surface water catchments Schedule 2 MNES Report, 27 February 2009
7	Existing marine and land uses in and adjacent to the proposal	Sections: 3.1(f) Commonwealth marine area 3.3(f) Marine areas 3.3(k) Existing land/marine uses of area 3.3(l) Any proposed land/marine uses of area. Figures: Fig 1 ERA leases & Ranger mine in the Alligator Rivers Region of the Northern Territory in relation to geographic & geomorphic features of the landscape Fig 2 Location of ERA leases in relation to Darwin, Kakadu National Park & Arnhem Land Schedule 2 MNES Report, 27 February 2009



Criteria No	Description	Relevant sections and/or figures in the EPBC Referral
8	Waste management and pollution control on and offsite	Sections: 2.1.1 Heap leach facility 2.1.5 Residues storage 2.3 Context, planning framework and state/local government requirements 2.3.1 Context of this referral 4 Measures to avoid or reduce impacts Schedule 1 Ranger authorisation 0108-10 (April 2008) Schedule 3 ERA's Environmental Policy
9	Other environmental factors	Section: 3.1 Matters of national environmental significance 3.3 Other important features of the environment Figures: Fig 5 Recent biodiversity survey locations on ERA's Ranger and Jabiluka leases Fig 6 Recordings of listed species of conservation significance on the Ranger and Jabiluka leases Fig 7 Broad-scale geology (BMR interpretation, 1980) Fig 8 Pre-mining surface water catchments For information regarding ERA's regional and national economic contribution, refer to Annual Reports and Sustainable Development Reports located on the ERA website: www.energyres.com.au/media_centre/reports
10	Sources and scale of greenhouse gas emissions from the proposal	3.1.2.5 Greenhouse gas emissions
11	Aboriginal and sacred sites clearance	Section: 3.1.2.8 Cultural heritage 3.3(i) Other important or unique values of the environment
12	Timing of proposed action, including stages and decommissioning	Sections: 1.8 Timeframe 1.1 Short description 2.1 Description of proposed action Schedule 1 Ranger Authorisation 0108-10 (April 2008)
13	Description of proposed environmental commitments, safeguards, monitoring and management systems	Sections: 2.3 Context, planning framework and state/local government requirements 2.3.1 Context of this referral 4. Measures to avoid or reduce impacts Schedule 1 Ranger Authorisation 0108-10 (April 2008) Schedule 3 ERA's Environmental Policy



Criteria No	Description	Relevant sections and/or figures in the EPBC Referral
14	Proposed rehabilitation and decommissioning	Sections: 1.1 Short description 2.1 Description of proposed action Schedule 1 Ranger Authorisation 0108-10 (April 2008) Schedule 3 ERA's Environmental Policy



Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be taken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Marine environment (sections 23 and 24A)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
 - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
 - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

- the Policy Statement titled [Significant Impact Guidelines 1.1 – Matters of National Environmental Significance](#). Additional [sectoral guidelines](#) are also available.
- the Policy Statement titled [Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies](#).
- the [interactive map tool](#) (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read '[Fact Sheet 6 Staged Developments/Split Referrals](#)' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's [web site](#).

What information do I need to provide?

Schedule 2 of the EPBC Regulations sets out the information that must be included in a referral. Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment (Note: the Minister may decide not to publish information that is commercial-in-confidence). To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point

Environment Assessment Branch

Department of the Environment, Water, Heritage and the Arts

GPO Box 787

CANBERRA ACT 2601

If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment (**Note: the Minister may decide not to publish information that is commercial-in-confidence**).

The Department will write to you at the end of 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral, including:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action has, will have or is likely to have a significant impact it is called a *controlled action* and the particular matters upon which the action may have a significant impact (such as World Heritage or threatened species) are known as the *controlling provisions*.

The proposed action is subject to a public assessment process before it can be considered for approval. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

Compliance audits

The Department may audit your project at any time to ensure that it was completed in accordance with the information provided in the referral or the particular manner specified in the decision. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Heap leach facility for Energy Resources of Australia Ltd's Ranger uranium mine

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(j).

1.1 Short Description

Energy Resources of Australia Ltd (**ERA**) is a 68.4% owned subsidiary of the Rio Tinto group. ERA has owned and operated the Ranger uranium mine since Commonwealth Government approval in 1977. Since producing its first drum of uranium oxide (U_3O_8) in 1981, the Ranger mine has become Australia's major uranium producer, providing 11% of the world's uranium needs, used solely to fuel nuclear power plants for the generation of electricity. Further general and historical information about ERA and the Ranger uranium mine can be found on the ERA website at www.energyres.com.au. Information regarding Ranger's environmental performance is reported in the Supervising Scientist Division's annual reports located at: www.environment.gov.au/ssd/about/corporatedocs.html.

ERA expects to mine ore from its Ranger #3 open pit until 2012 and process ore using the existing mill until the end of 2020. ERA proposes to commence processing of low grade ore, which is currently stockpiled or is yet to be mined from the pit, using dynamic heap leaching technology. Heap leaching will operate concurrently with existing processing extraction facilities in use at Ranger and will not extend the current operational life of the mine.

A ~10Mtpa dynamic heap leach facility will be constructed to recover ~15,000 to 20,000 tonnes of uranium oxide (U_3O_8) contained in low grade mineralised material both *in situ* and on existing stockpiles. The facility will consist of heaps ~5m high that will be built and removed on a regular cycle and the residues stored appropriately after leaching is completed. The leach solutions will be treated in a process similar to that used in the existing Ranger plant.

New structures for the temporary storage of solid and liquid residues from the heap leaching facility, as well as tailings and process water from the existing Ranger processing plant, will be constructed. When mining of Pit #3 is completed, the tailings and heap leach residues temporarily stored in the new structures and existing dam will be transferred to the pit for permanent containment, as required by the Ranger Authorisation.

1.2 Latitude and longitude

The Ranger Project Area (**RPA**) (Fig 1) is defined as:

All that piece of land in the Northern Territory of Australia containing an area of 78.6 square kilometres more or less bounded by lines described as follows:

Commencing at the intersection of latitude 12 degrees 38 minutes with longitude 132 degrees 53 minutes 30 seconds thence proceeding to the intersection of latitude 12 degrees 36 minutes with longitude 132 degrees 53 minutes 30 seconds thence proceeding to the intersection of latitude 12 degrees 36 minutes with longitude 132 degrees 53 minutes thence proceeding to the intersection of latitude 12 degrees 35 minutes with longitude 132 degrees 53 minutes thence proceeding to a point which lies at the intersection of latitude 12 degrees 35 minutes with a line joining the intersections of latitude 12 degrees 29 minutes with longitude 132 degrees 51 minutes and latitude 12 degrees 36 minutes with longitude 132 degrees 55 minutes thence proceeding to the intersection of latitude 12 degrees 36 minutes with longitude 132 degrees 55 minutes thence proceeding to a point which lies at the intersection of longitude 132 degrees 56 minutes 22 seconds with a line joining the intersections of latitude 12 degrees 36 minutes with longitude 132 degrees 55 minutes and latitude 12 degrees 33 minutes 20 seconds with longitude 133 degrees thence proceeding to the intersection of latitude 12 degrees 42 minutes 39 seconds with longitude 132 degrees 56 minutes 22 seconds thence proceeding to the intersection of latitude 12 degrees

42 minutes 39 seconds with longitude 132 degrees 53 minutes thence proceeding to a point which lies at the intersection of longitude 132 degrees 53 minutes with a line joining the intersection of latitude 12 degrees 38 minutes with longitude 132 degrees 53 minutes 30 seconds and latitude 12 degrees 39 minutes 50 seconds with longitude 132 degrees 49 minutes thence proceeding to the intersection of latitude 12 degrees 38 minutes with longitude 132 degrees 53 minutes 30 seconds.

It is surrounded by Kakadu National Park, in the Alligator Rivers Region of the Northern Territory, and lies just west of Arnhem Land (Fig 2). Ranger Mine is located close to the southern boundary of the RPA and constitutes an area of disturbance, including the Jabiru airport, of approximately 2,270ha (Fig 3).

1.3 Locality

Provide a brief physical description of the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

ERA's Ranger uranium mine is on Aboriginal land surrounded by, but separate from, Kakadu National Park. It is located approximately 250km east of Darwin and 11km east of the regional centre of Jabiru, in the Alligator Rivers Region (Fig 2). Immediately north of the mine is an airport and associated infrastructure (Fig 3) which services the mine (fly-in-fly-out employees and contractors), the tourist industry of Kakadu National Park, and the Jabiru communities.

1.4 Size of the development footprint or work area (hectares)

Existing Ranger Mine operations currently occupy ~2,270ha or ~30% of the total area of the RPA (78.6 km²). The turquoise boundary shown in Figure 3, delineates the area within which the current mine operations are contained and in which disturbance by the proposed action may occur. The white boundary and co-ordinates shown on Fig 3 indicate the area used to search the Commonwealth Matters of National Environmental Significance (**MNES**), as recognised under the EPBC Act. The MNES report is provided as Schedule 2 and the results of the search are discussed in Section 3.1.

1.5 Street address of the site

Ranger Uranium Mine
Arnhem Highway
JABIRU NT 0886

1.6 Lot description

N/A

1.7 Local Government Area and Council contact (if known)

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

There is no local government planning approval required for the expansion of operations and associated facilities on the RPA.

1.8 Timeframe

Specify the timeframe in which the action will be taken including the estimated start date of construction/operation.

Construction of the heap leach facility is proposed to start in late 2010 with production commencing in 2012. The construction and operation of the heap leaching facility does not alter the current mining and processing timeline. Mining and processing will be completed by the end of 2020 with rehabilitation occurring within the period 2021 – 2026, in accordance with the current s41 Authority and Ranger Authorisation.

1.9	Alternatives Does the proposed action include alternative timeframes, locations or activities?	X	No
			Yes, you must also complete Section 2.2
1.10	State assessment Is the action subject to a state or territory environmental impact assessment?		No
		X	Yes, you must also complete Section 2.4
1.11	Component of larger action Is the proposed action a component of a larger action?	X	No
			Yes, you must also complete Section 2.6
1.12	Related actions/proposals Is the proposed action related to other actions or proposals in the region (if known)?	X	No
			Yes, provide details:
1.13	Australian Government funding Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	X	No
			Yes, provide details:

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.6.

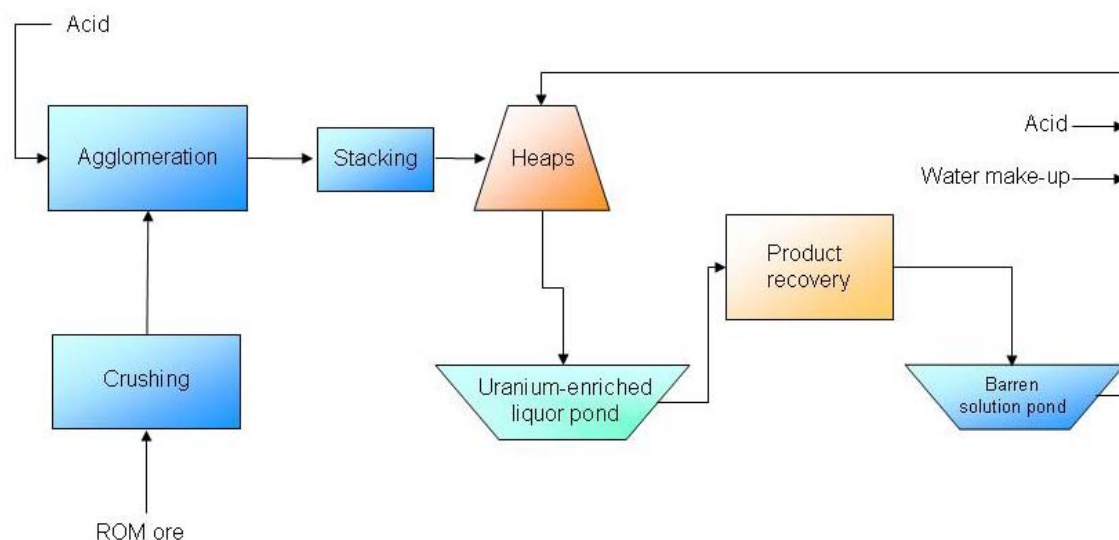
2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

ERA's existing operations at Ranger mine are managed through a comprehensive set of government Acts and regulations, including an Authority issued under Section 41 of the *Atomic Energy Act 1953* (Cth) ("the s41 Authority") and an Authorisation issued under the *Mining Management Act 2001* (NT) (the "Ranger Authorisation"). ERA is seeking government approval to construct a heap leach facility and associated infrastructure described in Section 2.1.1, to commence processing of low grade ore which is currently stockpiled or will be mined in future from the currently approved pit. Heap leaching will be undertaken concurrently with existing U_3O_8 extraction processes in operation at Ranger and will not extend the current life of the mine.

2.1.1 Heap Leach Facility

Processing of low grade ore at Ranger will be undertaken by constructing a ~10Mtpa low grade ore (heap) leaching facility to recover 15,000 - 20,000 tonnes of U_3O_8 . Dynamic heap leaching, which is a well established technology utilised extensively in South America, has been identified as the process that is most appropriate technically, environmentally and economically to process Ranger low grade ore. A typical heap leach flow diagram is provided below:



The proposed dynamic (single lift ~5m high, on/off mode) heap leach facility involves the construction of a fixed footprint, reusable pad from which low grade ore can be removed and stored appropriately once leached. Investigations thus far at Ranger have identified a number of possible locations for the facility which will include the ore stack and the associated water, leachate and uranium-enriched liquor ponds. Facilities will be constructed at a site selected to meet environmental, cultural heritage and engineering requirements.

The single lift heap will be constructed of crushed and agglomerated low grade ore laid by conveyors onto a lined base. The agglomeration process involves mixing of crushed low grade ore with sulphuric acid to bind the finest particles together with the coarser particles to form a coarse, sandy gravel that is relatively free draining. Dilute sulphuric acid leach liquor will be irrigated on the top of the heap of agglomerated ore via pipes with low pressure drippers and percolate to the base of the heap where it will be collected in a series of drains and directed, without pre-concentration, to an extraction system similar to that currently in use in the existing Ranger processing plant. After leaching, the residual agglomerated ore will be reclaimed and placed in temporary storage.

New temporary storage facilities for the residues from the low grade ore leach facility, as well as tailings and process water from the existing Ranger processing plant, will be constructed. Leach residues will be stored temporarily from commencement of leach operations in 2012 until Pit #3 is available for their permanent storage. These temporary storage facilities would likely be located south and west of the existing operations, have a similar footprint to the current tailings dam, and be designed and constructed to minimise seepage. When mining of Pit #3 is completed in 2012, and the pit has been prepared to receive tailings by 2013, the tailings and low grade ore leach residues temporarily stored in the new and existing facilities will be transferred to the pit for permanent containment, as required by the Ranger Authorisation.

Environmental controls for the heap leach facilities will include:

- lining with leak detection for leach pads, pond and channel liners;
- the construction of perimeter berms around the operating heap and pond areas;
- elimination of misting of leach solution by using appropriately designed low pressure dripper systems;
- the containment of residues in appropriate temporary and then permanent storage facilities; and
- a storm water system, integrated into the existing Ranger water management system, sized to hold the entire volume of free solution in the operating heap plus the rainfall from storm events to supplement the combined volume of the process liquor ponds.

The overall dimensions of the low grade ore leach facility and associated infrastructure, which also represents the rainfall catchment area, is estimated to be ~170ha. The final design and location of the heap leach facility will be determined during the Environmental Impact Assessment (*EIA*) process and subsequent plans will be submitted to the Authorities for approval.

2.1.2 Transport of consumables through Kakadu National Park

Mining and processing at Ranger mine relies on the supply and bulk haulage by road of materials such as fuels, sulphuric acid, ammonia, pyrolusite, lime, kerosene, explosive and amine, and this has been taking place using the Arnhem and Kakadu Highways as transport routes over 29 years. Consumables are not expected to change significantly as a consequence of expanding the Ranger operations but this will be confirmed during the EIA process.

Commissioning of the low grade ore leach facility will increase sulphuric acid requirements above that currently used on site to process ore. However, this increase will be offset by a reduction in acid demand by the existing 2.4Mtpa processing plant, occurring over the remaining life of the operation. The other consumables requirements involved in mining and processing are not expected to change significantly as a consequence of the heap leach operation. The transportation of dangerous goods to the Ranger mine site is undertaken by specialist accredited contractors supported by highly proficient, national emergency response teams, available 24-7 to respond to incidents.

A Referral submitted to the Commonwealth in October 2006 under the EPBC Act for expansion of road transport of sulphuric acid to Ranger mine was determined by the Department of the Environment, Water Heritage and the Arts not to be a controlled action.

Preliminary data on traffic flows and potential impacts along the Arnhem and Kakadu Highways indicates that, in 2007, the Ranger operations contributed less than 5% of the annual average daily traffic and approximately 11% of the total commercial vehicle traffic along the Arnhem Highway, and less than 1% of the annual average daily traffic and less than 3% of commercial vehicle traffic along the Kakadu Highway. Further investigations are underway and will include engagement with other key road users to integrate existing survey and other data (including the substantial dataset obtained over many years by Parks Australia North) into the analysis and to identify or determine the potential transport impacts arising from the proposed action.

2.1.3 Accommodation

Addressing accommodation requirements and shortages is an ongoing operational activity and subject to an existing approvals process, under the Planning Act, Section 8, and assessment against the Jabiru Town Plan 1981. In order to minimise social impacts in Jabiru of an expansion of Ranger mine operations, the increased workforce, including both contractors and permanent fly-in-fly-out employees, will be housed in existing or proposed accommodation facilities constructed for current and ongoing operations.

2.1.4 Transport of employees and contractors through Kakadu National Park

Employees and contractors are transported to Jabiru by means of road transport (bus-in-bus-out, private vehicles, hire vehicles) and air (fly-in-fly-out).

Social and community interactions between ERA employees and contractors and other elements of the Alligator Rivers Region community takes place predominantly in Jabiru. Jabiru was initially built by ERA as a mining town but is now a centre catering for the regional community, Kakadu National Park and its associated tourism, local businesses, and ERA.

ERA employees and contractors accommodated in Jabiru or in ERA's temporary accommodation facilities on the RPA agree to strict codes of conduct which include consumption of alcohol. All employees and contractors are subject to random drug and alcohol testing on reporting to work at the mine, and there is a zero tolerance policy to drugs and alcohol. Employees and key contractors are required to attend cross-cultural awareness training as part of their induction, and also attend briefings at Kakadu National Park Headquarters in relation to awareness of the World Heritage values of the National Park.

2.1.5 Residues storage

The Ranger Authorisation requires the secure temporary containment of process water and the permanent containment of other residues including tailings from the processing plant and leached low grade ore residues. The optimisation of water management across Ranger is ongoing and ERA is currently investigating a suite of options to deliver the most cost-effective, sustainable solution for short and long term water management, independent of the proposed heap leach project. Significant progress has been made during the prefeasibility study (*PFS*) with a target to deliver a process water management strategy in March 2009, for implementation beginning in Q2 2009.

In the context of this referral, modelling indicates that the existing tailings dam lifted to RL+54m (in progress) could provide the capacity to contain tailings and process water from the 2.4Mtpa processing plant until mining ceases in 2012 and Pit #3 becomes available in 2013 to receive tailings for permanent containment. However, new temporary storage structures will be required for the solid and liquid residues from the low grade ore leaching facility, as well as tailings and process water from the existing Ranger processing plant, to provide an adequate contingency.

The process water inventory derived from heap leaching will be managed by minimising the catchment area, maximising evaporation and expanding process water treatment and disposal. This will maximise the available storage volume for tailings.

2.2 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative timeframes, locations or activities (in section 1.9) you must complete this section. Describe any alternatives related to the physical location of the action, time-frames within which the action is to be taken and alternative methods or activities for undertaking the action. Please note if the action that you propose to take is determined to be a controlled action, any alternative locations, timeframes or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

A provisional site layout of one option for the heap leach facility and ancillary infrastructure is provided in Figure 4. The exact location of the heap leach facility, leach residues storage facilities and ancillary infrastructure will be selected during the EIA process and the associated detailed engineering studies.

2.3 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (eg. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

Mining and processing operations at Ranger mine are subject to a comprehensive and complex system of both Commonwealth and Northern Territory legislation.

Key legislation relevant to activities, including the proposed expansion project, at the Ranger mine includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**)
- *Atomic Energy Act 1953* (Cth)
- *Environment Protection (Alligator Rivers Region) Act 1978* (Cth) (**EP(ARR) Act**)
- *Aboriginal Land Rights (Northern Territory) Act 1976* (Cth) (**ALRA**)
- *Mining Management Act 2001* (NT)
- *Environmental Assessment Act 1982* (NT)

The Ranger mine is situated within the RPA which was established under the Authority to Mine, issued under Section 41 of the *Atomic Energy Act 1953*. The current Section 41 Authority is granted subject to Environmental Requirements (**ERs**) which are also appended to and integrated into the Ranger General Authorisation issued by the Northern Territory Government under the *Mining Management Act 2001*. The ERs set out a number of environment protection and rehabilitation measures required by the Commonwealth and with which ERA must comply. The ERs also focus on how activities at Ranger must not impact on the values, attributes and ecosystem health of KNP or the health of the regional community. The Ranger Authorisation stipulates in some detail how ERA must conduct its operations to ensure observance with the ERs.

ERA considers that the ERs attached to the Section 41 Authority and the Ranger Authorisation, and stipulating the required environment protection and rehabilitation measures relating to activities at Ranger, will not require any material amendment as a result of the proposed heap leach project. The Ranger Authorisation itself will, however, need amendment to reflect the implementation of these existing environment protection and rehabilitation measures and controls for the additional facilities to be developed as part of the proposed heap leach project.

Legislation and regulation relevant to the proposed expansion project include the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the Northern Territory *Environment Assessment Act 1982* and the Northern Territory *Mining Management Act 2001*. Matters relating to technical work plans and construction are expected to be largely dealt with under the *Mining Management Act 2001*. Matters relevant to environmental protection and biodiversity conservation, including avoiding, minimising and managing any environmental impacts as a result of the proposed expansion project, can be addressed via an assessment

process satisfactory to both the Northern Territory and Commonwealth governments. ERA anticipates such a process will be streamlined in accordance with the sentiments expressed in the bilateral agreement between the Commonwealth and the Northern Territory governments under section 45 of the EPBC Act.

In addition to these legislative requirements, activities at Ranger are subject to monitoring and oversight by the:

- Commonwealth Supervising Scientist Division (**SSD**) (established under the EP (ARR) Act);
- Minesite Technical Committee (**MTC**) (established under working arrangements agreed between the Commonwealth Government and Northern Territory Government for the regulation of uranium mining);
- Alligator Rivers Region Technical Committee (**ARRTC**) (established under the EP(ARR) Act); and the
- Alligator Rivers Region Advisory Committee (**ARRAC**) (also established under the EP (ARR) Act)

The functions of the SSD include providing advice to the Commonwealth Minister on environmental matters associated with uranium mining in the region. The SSD develops and coordinates research and monitoring programs and develops standards, practices and procedures in relation to mining which may be applied at Ranger. The SSD also investigates and reports on events and incidents at Ranger mine. Through the MTC, the SSD provides recommendations and advice on behalf of the Commonwealth to the Northern Territory on the environmental regulation of Ranger in accordance with the working arrangements agreed between the two governments.

The MTC is a key forum for discussion about and regulation of environmental and operational matters at Ranger. The MTC is chaired by the Northern Territory Government (the designated Supervisory Authority) and its members include representatives from ERA, the Northern Land Council and SSD. The Gundjeihmi Aboriginal Corporation, representing the Mirarr Traditional Owners, also attends and participates in the MTC processes. The MTC generally meets monthly and also provides advice to ERA on best mining practice.

The ARRTC is a scientific advisory panel established to review the research relating to protection of the environment from the potential impacts of uranium mining in the Alligator Rivers Region. The Committee, which is appointed by the Commonwealth Minister for the Environment, consists of seven independent scientists nominated by the Federation of Australian Scientists and Technological Societies, and representatives of six stakeholder organisations (including the NT Government, SSD, ERA, the Northern Land Council, which represents Traditional Owners in the area, Parks Australia, and Uranium Equities Limited, representing Nabarlek).

The ARRAC was established to provide a formal forum for communication between community, government and industry on matters relating to the environment, uranium mining activities and other environmental research matters. Membership includes representatives of:

- the Northern Territory Government;
- the Commonwealth Government;
- Aboriginal associations;
- ERA and other companies;
- West Arnhem Shire Council;
- the Environment Centre NT; and
- the SSD.

ERA's ongoing reports to, and active participation in, all these forums assists the company to ensure that it takes account of stakeholder views, concerns and information and maintains transparency in reporting and planning in relation to the RPA.

The detailed regulatory framework for Ranger mine is described in the current Ranger Authorisation (0108-10) issued under the *Mining Management Act 2001*, which embodies the Commonwealth ERs and prescribes the operational compliance and reporting regimes. A copy of the current Authorisation is attached at Schedule 1.

2.3.1 Context of this referral

Under the current s41 Authority and Ranger Authorisation, ERA is permitted to mine and process uranium ore at Ranger mine until January 2021.

It is not anticipated that the proposed heap leach project will change the environmental management systems at the site, although they will be expanded, nor impact on ERA's capability to adhere to statutory compliance obligations and continue to protect the downstream environment.

As indicated in Section 2.3, operations at Ranger mine are subject to ongoing close scrutiny by the Northern Territory Government and the Commonwealth Government, including by the SSD, and ERA is required to submit regular statutory reports demonstrating compliance with all regulations pertaining to the operations. The MTC and other stakeholders have been informed and periodically updated during 2007 and 2008 of ERA's conceptual plans to expand the Ranger operation.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.10) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Consistent with the agreed working arrangements between the Commonwealth and Northern Territory governments and the existing bilateral agreement under the EPBC Act, ERA expects that guidelines for one environmental impact assessment process can be agreed with both governments in order to minimise duplication and satisfy the requirements of the processes deemed to apply by either government.

It is expected that formal public consultation will be undertaken during the assessment process. Section 3.1.2.8 provides an outline of ERA's proposed Social Impact Assessment process, which is currently being developed.

Initial public consultation and awareness has been raised through ERA's announcements to the ASX since September 2007 and subsequent briefings with stakeholders since an ARRTC meeting in October 2007. The MTC has been regularly updated on ERA's expansion concepts at its monthly meetings.

In addition, the Gundjeihmi Aboriginal Corporation (**GAC**) (representing the Mirarr Traditional Owners) has received various briefings by ERA's Chief Executive and other senior ERA Managers and consultants since June 2008 and most recently in February and March 2009 after the GAC Chief Executive had been provided with a draft of this Referral. The ARRAC was briefed in August 2008, and the Kakadu Board of Management (which receives quarterly reports from ERA) was updated in September and December 2008, and in March 2009.

2.5 Consultation with Indigenous stakeholders

Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral.

The principal Indigenous Traditional Owner group is the Mirarr, as represented by the Gundjeihmi Aboriginal Corporation. Other relevant Indigenous stakeholders (representing Aboriginals affected) are the Djabulukgu Association and the Gagudju Association. The Northern Land Council (**NLC**) is the legal body representing Traditional Owners.

Indigenous stakeholders and their representatives, including the Northern Land Council, are kept informed of all company activities at Ranger through the ARRAC, ARRTC and MTC. Regional Aboriginal groups, not represented by key stakeholder groups, are also kept informed of Ranger's activities through ERA reports to the quarterly Kakadu National Park Board of Management meetings, the most recent of which was in March, 2009. In addition, the ERA Chief Executive and other senior managers are in regular informal contact with both the GAC and the NLC in relation to ERA's operations.

Routine Periodic Inspections (**RPI**) are conducted monthly at Ranger by members or representatives of the MTC, including the NLC and the GAC. These inspections provide stakeholders and ERA with an opportunity to discuss operational and expansion issues, as well as gain a snapshot of the company's ongoing environmental management performance, and any concerns of the stakeholders are recorded. In addition to the monthly inspections, there is an annual environmental audit of ERA's Ranger operations and a formal report provided to ERA.

The following table provides details of formal consultations and communications that have involved Indigenous stakeholders, or their representatives, to date.

Date	Forum	Consultation/communication advice
01 October 2007	Minesite Technical Committee	Powerpoint presentation update on Ranger mine operations and expansion concepts
09 October 2007	ARRTC meeting	Powerpoint presentation overviewing Ranger operations and expansion concepts
12 June 2008	Gundjeihmi Aboriginal Corporation	ERA Chief Executive presentation on Ranger expansion concepts
04 July 2008	Minesite Technical Committee	Powerpoint presentation on Ranger expansion concepts
07 August 2008	ARRAC meeting	Powerpoint presentation on Ranger and Jabiluka operations and Ranger expansion concepts
10 September 2008	Kakadu National Park Board of Management meeting	Quarterly ERA report to Board; general discussion and response to questions at meeting
13 January 2009	Gundjeihmi Aboriginal Corporation	Draft referral provided to GAC CEO and subsequently to the NLC for information
January-March 2009	Gundjeihmi Aboriginal Corporation	Various meetings & telephone conversations between ERA senior managers and their consultants with GAC executives and committee members regarding Ranger expansion
5 March 2009	Kakadu National Park Board of Management meeting	Quarterly ERA report to Board; general discussion and response to questions at meeting

2.6 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.11) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

As identified in Section 1.11, the proposed action described in this referral is not a component of a larger action or project being referred under the EPBC Act.

However, as indicated in ASX announcements, ERA has an ongoing commitment to exploration programs on the RPA. As a result, further extensions of the existing operations may occur in the future and would be subject to separate assessment and approval. This includes activities and works such as proposed Ranger 3 Deeps exploration, which will be referred separately to the Commonwealth Minister for consideration and assessment.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The [interactive map tool](#) can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of impacts should refer to the following resources (available from the Department's web site):

- specific values of individual [World Heritage properties](#), [National Heritage places](#) and the ecological character of [Ramsar wetlands](#);
- profiles of relevant species/communities (where available), that will assist in the identification of significance;
- [Significant Impact Guidelines 1.1 – Matters of National Environmental Significance](#); and
- associated sectoral and species policy statements available on the web site, as relevant.

Note that even if your action will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

The RPA is the area described in Sections 1.2 and 1.4, above. The area affected by the proposed action lies within the area of disturbance that includes the site of the existing operation, and is delineated by the turquoise boundary shown in Figure 3.

Ongoing research aims to effectively understand and manage, and continuously improve, methods of environmental control and awareness. A considerable amount of information has been accumulated by ERA, the Commonwealth's SSD and others since the mining operation commenced in 1979. Extensive monitoring and research programs have assisted the ongoing protection of the environment surrounding ERA's mining operations.

A search of the Department of Environment, Water, Heritage and the Arts (**DEWHA**) Environmental Reporting Tool and Protected Matters Search Tool were conducted in February 2009. A report was generated on Matters of National Environmental Significance (**MNES**), as recognised under the EPBC Act and is provided as Schedule 2. The report was generated using the co-ordinates for the area shown as the white boundary on Figure 3, which extends past the area affected by the proposed action to include a substantial buffer zone, thus providing a more accurate identification of relevant environmental matters pertaining to the immediate surrounds of the RPA. The results of the search are summarised in Table 1. These data are further supplemented by the results of biodiversity surveys undertaken on both disturbed and undisturbed areas of the RPA since mining commenced.

In addition to MNES matters, a search of the Natural Resources, Environment, The Arts and Sport (**NRETAS**) **sites of conservation significance** in the Northern Territory shows that the RPA lies adjacent to (but exclusive from) the Western Arnhem Plateau and Alligator Rivers coastal floodplain (refer the NRETAS website: www.nt.gov.au/nreta/environment/conservation/).

Potential impacts of the proposed action on MNES in the disturbed area of the RPA are not considered to be significant. However, the identification of MNES in the area remains relevant to downstream areas of the lease and surrounding Kakadu National Park and, as such, aspects of MNES which could potentially be affected by the proposed action are listed and discussed in Section 3.1.2 and 3.1.2.1, respectively.

Environmental management and control of surface water and groundwater for the existing operation can be readily enhanced to encompass the proposed action. However, changes to environmental management and monitoring systems are not expected to be significant due to the liner systems and other environmental controls described in Section 2.1.1, that will be implemented.

Table 1: Summary of MNES, as recognised under the EPBC Act

Matters of National Environmental Significance	Number	Comments
World Heritage Properties	1	Kakadu National Park surrounds but is separate to the Ranger Project Area within which Ranger mine is located.
National Heritage Places	1	Kakadu National Park surrounds but is separate to the Ranger Project Area within which Ranger mine is located.
Wetlands of International Significance	3	Kakadu National Park (Stage 1 & 3) Kakadu National Park (Sate 2) within 10km of Ramsar site Cobourge Peninsula – within same catchment as Ramsar site Ranger is located with the catchment areas of the 3 Ramsar sites identified by the MNES search
Commonwealth lands	2	Kakadu National Park surrounds but is separate to the Ranger Project Area within which Ranger mine is located. Alligator Rivers Region NT
Threatened Ecological Communities	None	No threatened ecological communities were identified by the EPBC search, or occur in the Northern Territory
Threatened Species	12	
Migratory Species	20	
Commonwealth Marine Areas	None	

3.1 (a) (b) (c) World Heritage Properties; National Heritage Places & Declared Ramsar Wetlands

3.1.1 Description

ERA's Ranger uranium mine is located on a mining lease that is surrounded by, but separate from, the Kakadu National Park (**KNP**), a World Heritage Property and National Heritage Place. The wetlands of KNP are listed as Wetlands of International Importance under the Ramsar convention, based on a combination of ecological, botanical and zoological criteria.

3.1.2 Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property, the National Heritage values of any National Heritage place; and the ecological character of any Ramsar wetlands

The Ranger mine has been operating for over 29 years under a strict regulatory framework, and effective environmental management and monitoring systems. While the proposed action may be assessed as a controlled action, ERA considers that existing regulatory and operating systems, together with the Commonwealth ERs set out in the Ranger Authorisation, ensure that appropriate controls are in place to manage impacts and mitigate any potential for additional risks to the surrounding environment. A number of mitigation and contingency measures are in place to reduce potential risks to the specific landscape and social/cultural elements of the surrounding KNP, National Heritage places and Ramsar wetlands. Further discussion is provided below in relation to:

- Downstream water quality
- Soils
- Flora & fauna
- Air quality (dust)
- Greenhouse gas emissions (**GHG**)
- Radiation
- Visual amenity
- Cultural heritage
- Social impacts
- Transport of consumables through KNP

3.1.2.1 Downstream water quality

The project area is located in the Magela Creek catchment (see Fig 1), upstream of the confluence of Magela and Gulungul creeks. Magela Creek is a tributary of the East Alligator River which originates in the Arnhem Land Plateau (Fig 2). The Magela floodplain is located downstream of the RPA and is a seasonally inundated, black-clay floodplain with permanent billabongs (Fig 1).

The NT government conducts official check monitoring, while both ERA and the Commonwealth's Supervising Scientist Division separately conduct routine monitoring and evaluation of the quality of surface waters upstream and downstream of Ranger mine in Magela Creek and Gulungul Creek. These data are reported on the Supervising Scientist's website (<http://www.environment.gov.au/ssd/monitoring/index.html>), by ERA in weekly reports to the MTC during the wet season, and by ERA in annual wet season summary reports to the Supervising Authority. These water quality data provide an assessment of the environmental performance of Ranger against the water quality objectives and compliance criteria that have been set for receiving waters in the Ranger Authorisation (0108-10) issued under the *Mining Management Act 2001*.

In the context of the proposed action, there is a potential for environmental impacts in the immediate area of mining operations, and to nearby downstream areas of the RPA (Fig 1), due to:

- deterioration of surface water and groundwater quality due to seepage from the heap leach facility, including the new residues storage areas;
- effects on downstream aquatic flora and fauna due to a deterioration of runoff water quality; and
- increased sediment transported from disturbed areas to downstream receiving waters.

However, the studies undertaken thus far indicate that any additional potential environmental impacts will be incremental and small, and will be managed within existing controls and contingencies.

3.1.2.2 Soils

The impacts of the current operations at Ranger on local soils are well understood. Disturbance of vegetation and natural soils, and contamination, are restricted to areas close to the operations. Landscapes outside the mine area are not impacted by ERA's operations.

The proposed action will involve the construction of the new heap leach pad and associated infrastructure, including a new temporary residues storage facility.

No significant changes in environmental management or monitoring systems are envisaged, nor of strategies for remediation and rehabilitation, since these will be essentially the same as set out in the Ranger Authorisation and foreshadowed in the annual amended Plans of Rehabilitation and the Closure Model. Soils outside the current area of disturbance are unlikely to be impacted by the proposed action.

3.1.2.3 Flora & Fauna

The flora and fauna of the RPA, prior to mining, were well described in the Environmental Impact Statement (*EIS*) and supporting documentation.

A significant number of studies of flora and fauna have been conducted at Ranger in both disturbed and undisturbed areas since mining commenced. The locations of recent surveys are shown in Figure 5. Recent fauna surveys in eucalypt woodland areas to the south of the mine operations were conducted for all terrestrial vertebrate species (mammals, birds, reptiles and amphibians) to identify species of conservation significance that are known to occur elsewhere on the RPA and in the surrounding Kakadu National Park (Fig 6). The fauna likely to be found in the vicinity of the Ranger operation, and within the RPA, are typical of the fauna found throughout KNP, and include several taxa of conservation significance, as set out in Table 2 (Section 3.1e).

A total of 168 flora species, nine of which were weeds, were recorded during surveys undertaken in 2007. None of the plants recorded were listed under the *EPBC Act* or the *Territory Parks and Wildlife Conservation Act 2007* (*TPWC Act*). All of the weeds have been recorded previously in the area. There are no records of any plant species of conservation significance known from the lease.

Of the mammal, bird, reptile and frog species recorded in recent surveys, only the Partridge Pigeon *Geophaps smithii* is listed under the *EPBC Act* and Mertens water monitor *Varanus mertensi* (Mertens) under the *TPWC Act*. The introduced fauna species recorded during the surveys were the Asian Water Buffalo *Bubalus bubalis*, feral pig *Sus scrofa* and cane toad *Bufo marinus*. Partridge Pigeons are abundant in Kakadu National Park and in other parts of the RPA. Mertens is semi-aquatic and rarely seen far from water. Consequently, the impacts of the Ranger operation on these species are likely to have been small.

The proposed action is not expected to significantly increase impacts on flora and fauna species of conservation significance. Disturbance to the landscape will be temporary, and closure and rehabilitation plans require ERA to return the mine site to a condition in which it can be managed as if it were part of Kakadu National Park.

Any migratory species likely to be found in the vicinity of the Ranger operations, and within the RPA, will be typical of those found within KNP. Migratory species reside in suitable habitats throughout KNP. ERA believes that the proposed action is unlikely to modify, isolate or destroy an area of important habitat for a listed migratory species, or significantly disrupt the life-cycle of an ecologically significant population of a listed migratory species, particularly in light of plans to utilise areas within the existing disturbance area at Ranger mine.

3.1.2.4 Air quality

The proposed expansion of the Ranger operation will involve:

- the commissioning of a heap leach facility using low pressure drippers to irrigate the heap, thus eliminating the potential for spray drift;
- additional power generation equipment; and
- dust production.

These additions are not expected to change air quality management and monitoring systems at Ranger mine. The proposed action is not anticipated to generate additional impacts on the local or surrounding environment as a result of air quality.

Dust levels will be monitored during construction and dust production will be prevented by the use of water trucks and moisture management of exposed and non-vegetated areas such as construction/operational sites and roads.

3.1.2.5 Greenhouse gas emissions

The action will marginally increase the level of GHG emissions compared to the current operations. GHG emissions attributable to the action primarily occur as a result of increased diesel fuel consumption. This is a result of increased electricity consumption by processing equipment and additional fuel for mobile mining equipment. At this stage in the pre-feasibility study, actual mobile equipment movements and power generation requirements have not been determined to high levels of certainty. The accuracy of GHG emissions will improve as the PFS study progresses. As details become available on mobile equipment movements and power generation requirements, the life of mine model will be updated and the accuracy of the GHG emission will improve.

ERA is committed to produce product with GHG emissions as low as possible and uses Life Cycle Analysis (**LCA**) to analyse GHG production. Further, ERA continues to seek energy efficiency opportunities at Ranger as part of Energy Efficiency Opportunities (**EEO**) legislation.

3.1.2.6 Radiation

ERA's statutory radiation monitoring and reporting program in place at Ranger mine is prescribed under the NT Mining Management Act Authorisation 0108-10. The systems and the dose limits applied comply with all relevant Australian law taking into account the most recently published and relevant Australian standards, codes of practice and guidelines. The principal required outcomes are that:

- radiation doses to company employees and contractors are kept as low as reasonably achievable and are always less than the Australian dose limit for workers;
- radiation doses to people who are not company employees or contractors are kept as low as reasonably achievable and are always less than the Australian dose limit for members of the public; and
- ecosystems surrounding the Ranger operations do not suffer any significant deleterious radiological impacts.

There is a specific program of monitoring and reporting required by the Ranger Authorisation, as well as scrutiny of all data by the members of the MTC and other regulators. In terms of a possible ingestion pathway, studies by the Commonwealth's Supervising Scientist Division have demonstrated that levels of ²²⁶Ra in Magela Creek, including downstream of the mine, are very low and due to the natural occurrence of radium in the environment.

The proposed action may incrementally increase worker and the public exposure to radiation from increased surface area of low grade ore materials on leach pads. However, monitoring and management of dust and water at Ranger is effective, and compliance with statutory requirements set down in the Ranger Authorisation

provide effective controls over additional risks associated with the expansion project, to protect human health and environment.

3.1.2.7 Visual amenity

In order to facilitate both ongoing environmental management, and closure and rehabilitation works, the footprint of the operations has been kept as small as possible. This has resulted in elevated waste rock stockpiles and a progressive lifting of the walls of the tailings dam to temporarily contain tailings and process water.

The proposed action will impact on visual amenity as a result of construction of the heap leach facility and associated residue storage areas. However, these structures are temporary, of low elevation, and will be removed or substantially reshaped during rehabilitation to minimise visual impacts.

3.1.2.8 Cultural heritage

ERA has in place a Cultural Heritage Management System (**CHMS**) consistent with Rio Tinto standards. The CHMS is also consistent with the World Bank International Finance Corporation Performance Standard 8 (**IFC 8**) which recognises the importance of cultural heritage for current and future generations. The system includes sites having archaeological, paleontological, cultural, and artistic values as well as unique environmental features. It also includes intangible forms of culture such as cultural knowledge and unique practices. These inclusions are consistent with international best practice standards.

The ERA CHMS has been developed in collaboration with the GAC and reflects real and practical measures to prevent harm to cultural heritage sites and values. It is based on an Interim Protocol regarding cultural heritage management on the RPA that was also developed collaboratively with the GAC. Key elements of the system include: a) statutory requirements; b) accountabilities; c) consultation; d) integrated heritage authorisation procedures; e) cultural heritage site surveys and assessments; f) cultural heritage management plans; g) training and induction; h) contractor management; i) information and document management; j) incident investigation procedures; and k) monitoring and review procedures. The CHMS also applies to non-Indigenous cultural heritage.

The CHMS is fully integrated into business and operations planning and project evaluation. All decisions regarding cultural heritage site disturbance and/or management are made in consultation with the relevant Traditional Owners or other affected peoples or groups. ERA has adopted higher standards than those required in legislation that reflect international best practice in the area of cultural heritage management.

3.1.2.9 Social impacts

As part of ensuring best practice, ERA will also undertake to identify potential social risks and develop appropriate mitigation strategies through the conduct of a project-specific Social Impact Assessment (**SIA**). The design and focus of the SIA will reflect social and community risks specific to this project. This approach is consistent with the Rio Tinto Social Impact Assessment and Communities guidance notes, the Communities Policy and Consultation guidance, and with the World Bank International Performance Standard 7 (**IFC 7**). The key feature of these documents is to identify issues of importance to stakeholders and develop strategies to minimise the impacts and maximise the opportunities and benefits to the community. The aim is to avoid adverse impacts of projects on communities of Indigenous people or, when avoidance is not feasible, to minimise or mitigate such impacts and to provide opportunities for development benefits in a culturally appropriate manner.

There are five stages to the SIA process: 1) scoping that includes review of secondary data, legislative and regulatory requirements and preliminary issues investigation. This phase is carried out in pre-feasibility and is iterative in nature; 2) community baseline establishment that describes pre-existing socio-economic structures and conditions in the project area; 3) the impact assessment that predicts and evaluates potential effects; 4) development of mitigation and enhancement options; and 5) documenting the results into a SIA.

The approach used throughout all stages will be transparent and inclusive and the participation of the community and other interested stakeholders will be actively sought. Information, communication and informed participation are key components of the approach and are critical to obtaining sufficient and accurate information on the issues of importance. A Stakeholder Engagement Plan developed specifically for this project will guide the SIA process. Stakeholder communications will include (but will not be limited to): Traditional Owners, adjacent Aboriginal interests, Kakadu Board of Management, Parks Australia, local Jabiru and surrounding business owners, tour operators, government agencies, non-government organisations and other interested parties and individuals. Communication results will be documented thoroughly and the SIA will form

the basis of social impact management plans for the proposed project. It will also enable an interface with existing social management and engagement strategies.

Various communication tools will be used such as: maps and drawings; photos of infrastructure and other associated elements of the project; aerial photos; community handouts; 3D models/images of the proposed project infrastructure; newsletters; and a DVD in English and in language. Other communication mechanisms will be developed as and if required. In progressing through the SIA development, the Plan will be amended as required to reflect a changing social circumstance.

In summary, the SIA will involve the identification of different cultural value sets, knowledge systems and ways of describing environmental values and impacts to determine the key social issues and mitigation/enhancement strategies. This will include immediate, medium, long term and cumulative impacts. The first, second and third order consequences that occur as initial changes will affect other elements of the social environment and these will be predicted wherever possible.

3.1.2.10 Transport of consumables through KNP

As outlined previously in Section 2.1.2, Ranger mine relies on the supply and bulk haulage by road of materials using the Arnhem and Kakadu Highways by accredited specialist contractors. ERA is engaging an independent consultant to undertake a detailed assessment of traffic volumes and identify any potential transportation impacts. One objective of the studies is to provide short and long term strategies that mitigate the potential for traffic incidents involving contractor haulage. Key to this process will be engaging all relevant stakeholders.

3.1 (d) Listed threatened species and ecological communities

Description

The flora and fauna listed under the EPBC Act and likely to be found in the vicinity of the Ranger operation, within the RPA, or in the vicinity of the adjacent Kakadu National Park, are described in Table 2. The data are based on the most recent flora and fauna surveys undertaken during 2007 and 2008 (see also Fig 6).

Table 2: Listed threatened species and ecological communities occurring within the RPA or adjacent areas of Kakadu National Park

	Conservation Status			
MAMMALS			Preferred habitat	Likelihood of occurrence on RPA
Arnhem Leaf-nose Bat (<i>Hipposideros diadema inornata</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	Known from a few locations in the Arnhem Land sandstone massif (Deaf Adder Gorge and upper South Alligator River area and one site in Litchfield (Tolmer Falls)).	Very unlikely – This bat roosts in caves or abandoned mine adits in cool drafty areas close to water. These structures do not occur on the RPA and as a result its occurrence is very unlikely. However specific surveys for this species have not been undertaken.
Arnhem Rock Rat (<i>Zyomys maini</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	Restricted to sandstone massif of western Arnhem Land (including Jabiluka lease) ¹ .	Does not occur – substrate and habitat is not present on the RPA.
Brush-tailed Rabbit-rat (<i>Conilurus penicillatus</i>)	EPBC Act 1999 (effective Dec 2008) Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	Tall Eucalypt forests where there is less cover of annual grass, less cover of bare ground, a smaller basal area of dead trees and where the impact of fires is less severe are the preferred habitat of this rodent ² .	Very unlikely - There is one record for this species from 2003, however despite numerous recent surveys (68 survey sites) undertaken between 2003 and 2008 the Rabbit-rat has not again been recorded.

¹ Kerle, JA and Burgman, MA (1984). Some aspects of the ecology of the mammal fauna of the Jabiluka area, Northern Territory. *Australian Wildlife Research* **11**, 207-222.

Woinarski, J, Pavey, C, Kerrigan, R, Cowie, I & Ward, S eds. (2007). Lost from our Landscape. Northern Territory Department of Natural Resources the Environment and the Arts.

² Firth, RSC (2003) Activity range and den trees of the brush-tailed rabbit-rat on Cobourg Peninsula, Northern Territory, Australia. In 'Rats, Mice and People: Rodent biology and Management'. (Eds. GR Singleton, LA Hinds, CJ Krebs and DM Spratt.) pp. 99-102. (Australian Centre for International Agricultural Research Canberra.)

Firth, RSC, Jefferys, E, Woinarski, JCZ, & Noske, RA (2005) The diet of the brush-tailed rabbit-rat (*Conilurus penicillatus*) from the monsoonal tropics of the Northern Territory, Australia. *Wildlife Research* **32**, 517-523.

	Conservation Status			
Golden-backed Tree-rat (<i>Mesembriomys macrurus</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Critically endangered	Very little is known of the ecology of this species. The only information from the Northern Territory is that all three recordings were from riverine vegetation ³ .	Unlikely – no recorded sightings on or within the vicinity of the RPA. Last recorded sighting in Kakadu was at Deaf Adder Gorge in 1969.
Northern Brush-tailed Phascogale (<i>Phascogale tapoatafa pirata</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	Tall open forests dominated by <i>Eucalyptus miniata</i> and <i>E.tetradonta</i> .	Unlikely – Recent surveys (40 sites) undertaken in 2007 and 2008 have failed to detect this species.
Northern Quoll (<i>Dasyurus hallucatus</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Endangered Critically endangered	They occur in many habitats including eucalypt open forests, but the most suitable appears to be rocky areas.	Very unlikely - the Quoll has declined significantly or almost disappeared from many areas of the Top End of the Northern Territory as a result of the impact of ingesting the toxic cane toad ⁴ . The 2007 and 2008 surveys, which included a total of 40 survey sites, did not detect the presence of the Quoll on the RPA. Given this and its significant decline across much of the Top End, the likelihood of this species still occurring on the RPA is extremely unlikely to almost impossible.
	Conservation Status			
BIRDS				
Australian Bustard (<i>Ardeotis australis</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	This species is highly mobile and can be found in a variety of habitats from grasslands, low shrublands and grassy woodlands. They respond readily to fire and are often found on recently burnt country, even in more wooded areas	Unlikely - a large conspicuous bird that would be very difficult to miss while conducting surveys. A considerable number of sites have now been surveyed on the RPA (including all the incidental areas on the RPA traversed while on foot and driving) and this species has never been recorded.
Emu (<i>Dromaius novaehollandiae</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	It occurs in Top-End woodlands but its densities are very low.	Does occur – There is one recent record (2007) of a track near the Magela Creek on the RPA (pers. comm., A Hooke & R Firth).
Gouldian Finch (<i>Erythrura gouldiae</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Endangered Endangered	A colourful, nomadic finch that occupies two different habitats on an annual cycle. During the dry season they inhabit wooded hills that contain snappy or salmon gums, which provide nest sites. During the wet season they move from the hills to lowlands that support perennial grasses ³ .	Unlikely – historically recorded in the general area, however there have been no recorded sightings on, or within close vicinity of, the RPA.
Masked Owl (<i>Tyto novaehollandiae kimberli</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	Tall open forests dominated by <i>Eucalyptus miniata</i> and <i>E.tetradonta</i> but also roosts in monsoon rainforests, and forages in more open vegetation	Unlikely - this habitat does not occur in the area proposed to be disturbed. Further, this species has never been recorded on or within close vicinity of the RPA, despite recent substantial

Firth, RSC, Woinarski, JCZ, & Noske, RA (2006a) Home range and den characteristics of the brush-tailed rabbit-rat (*Conilurus penicillatus*) in the monsoonal tropics of the Northern Territory, *Australia. Wildlife Research* **33**, 397-407.

Firth, RSC, Woinarski, JCZ, Brennan, KG, & Hempel, C (2006b) Environmental relationships of the brush-tailed rabbit-rat *Conilurus penicillatus* and other small mammals on the Tiwi Islands, northern Australia. *Journal of Biogeography* **33**, 1820-1837.

Kemper, CM & Firth, RSC (2008) Brush-tailed Rabbit-rat, *Conilurus penicillatus* (Gould, 1842) In: *The Mammals of Australia Third Edition*. (Eds. S Van Dyck & R Strahan).

Firth, RSC, Woinarski, JCZ, Brennan, KG, & Low Choy, J (2008a submitted) Environmental relationships of the threatened brush-tailed rabbit-rat, *Conilurus penicillatus*, from two mainland conservation reserves in northern Australia and comparisons with an island population. *Austral Ecology*.

Firth, RSC, Brook, BW, Woinarski, JCZ, & Fordham, DA (2008b submitted) Population viability of a threatened northern Australian native rodent, the brush-tailed rabbit-rat *Conilurus penicillatus*. *Biological Conservation*.

³ Woinarski, J, Pavey, C, Kerrigan, R, Cowie, I & Ward, S eds. (2007). Lost from our Landscape. Northern Territory Department of Natural Resources the Environment and the Arts

⁴ Oakwood, M (2004). The effect of cane toads on a marsupial carnivore, the northern quoll, *Dasyurus hallucatus*. Report to Parks Australia (Envirotek, Nana Glen).

	Conservation Status			
			types, including grasslands ³ .	surveys undertaken during 2007 and 2008.
Partridge Pigeon (<i>Geophaps smithii smithii</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	They primarily occur in lowland eucalypt open forests and woodlands, with grassy understoreys.	Does occur – Common in the undisturbed parts of the RPA and in parts of Kakadu National Park ⁵ .
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	The preferred habitat is tall open eucalypt forest and riparian areas (including paperbark forest and gallery forests).	Unlikely – A conspicuous raptor that makes large conspicuous nests from sticks. Recent widespread surveys in 2007 and 2008, on the RPA have failed to detect it.
Yellow Chat (Alligator Rivers subspecies) (<i>Epthianura crocea tunneyi</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Endangered	Most records of this subspecies are from floodplain depressions and channels, concentrating around wetter areas at the end of the dry season.	Unlikely - This habitat does not occur in the area proposed to be disturbed. Furthermore it has not been recorded despite significant survey effort on the RPA which would further corroborate its absence (This bird is also very conspicuous due to its bright golden-yellow feathers (males) and so would be difficult to miss.)
REPTILES				
Arnhem Land Egernia (<i>Egernia obiri</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Endangered Endangered	Restricted to the western Arnhem Land plateau and outliers such as Jabiluka (Fig 6).	Does not occur – Substrate and habitat is not present on the RPA.
Oenpelli Python (<i>Morelia oenpelliensis</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	Restricted to the western Arnhem Land plateau and outliers such as Jabiluka	Does not occur – Substrate and habitat is not present on the RPA.
Merten's Water Monitor (<i>Varanus mertensi</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	This species is semi-aquatic and as such rarely seen far from water eg creeks and billabongs.	Does occur – This species has recently been recorded at 3 sites (2008) on the RPA and incidentally while conducting baseline flora and fauna surveys in 2007.
Yellow-spotted Monitor (<i>Varanus panoptes</i>)	Territory Parks and Wildlife Conservation Act 2000	Vulnerable	It occurs in a range of habitats eg coastal beaches, floodplains, grasslands and woodlands.	Unlikely – Despite substantial surveys this species has not been recorded on the RPA. This varanid like others is susceptible to the toxin produced by cane toads and has most likely declined significantly in the general area and region as a whole.
SHARKS				
Freshwater Sawfish (<i>Pristis microdon</i>)	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	Prefers muddy bottoms of freshwater areas and upper reaches of estuaries ³ .	Does not occur – habitat is not present on the RPA.
FLORA				
<i>Hibiscus brennanii</i>	EPBC Act 1999 Territory Parks and Wildlife Conservation Act 2000	Vulnerable Vulnerable	Restricted to one population on the Mt Brockman outlier of the western Arnhem Land sandstone massif ⁶	Does not occur – habitat is not present on the RPA.

No threatened ecological communities were identified by the EPBC search, or occur in the Northern Territory (see Section 3.1.2.3). Vegetation characteristics of ecological communities found on the RPA are discussed in Section 3.3(a).

Nature and extent of likely impact

Address any impacts on the members of any listed threatened species or any threatened ecological community, or their habitat

⁵ Woinarski, J (2006) Partridge Pigeon (eastern subspecies) *Geophaps smithii smithii*. Threatened species of the Northern Territory. Department of Natural Resources, Environment and the Arts, Northern Territory Government

⁶ NRETAS (2009) Threatened species of the Northern Territory – *Hibiscus brennanii*. www.nt.gov.au/nreta/wildlife/animals/threatened/pdf/plants/Hibiscus_brennanii_VU.pdf

Woinarski, J, Pavey, C, Kerrigan, R, Cowie, I & Ward, S eds. (2007). Lost from our Landscape. Northern Territory Department of Natural Resources the Environment and the Arts

Detailed flora and fauna surveys of areas around the Ranger operations and in surrounding parts of the RPA have been carried from the early 1970s to the present day. Much of the earliest work is summarised in documents relating to the Ranger EIS and the Ranger Uranium Environmental Inquiry (RUEI). More recent studies were undertaken by ERA and the Commonwealth's Supervising Scientist Division.

Likely impacts on listed threatened species are previously discussed in Section 3.1.2.3. Table 2 above, further outlines the likelihood of species occurring on the RPA and likely impacts. There are no threatened ecological communities occurring on the RPA or in the Northern Territory.

3.1 (e) Listed migratory species

Description

The migratory species likely to be found in the vicinity of the Ranger operations, and within the RPA, are typical of those found throughout Kakadu National Park. The EPBC search identified 20 migratory species (Schedule 2). However, of the 20 migratory species identified only the Rainbow Bee-eater (*Merops ornatus*) and Saltwater Crocodile (*Crocodylus porosus*) are known to occur on the RPA. The preferred habitat for the other 18 species listed either does not, or is highly unlikely to, occur on the RPA.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat

Migratory species reside in suitable habitats throughout Kakadu National Park. There are no known population foci of EPBC listed migratory species on or adjacent to the mine operations and consequently the risk of a significant impact on any listed migratory species by the current mining operations or the proposed action is considered to be very low.

The risk of significant impacts upon migratory birds downstream of the RRA is also considered to be low. As stated above, the annual reports of the Supervising Scientist to the Commonwealth Minister for the Environment have consistently stated that the extensive monitoring and research programs of the Supervising Scientist Division confirm that the environment surrounding ERA's mining operations has remained protected.

3.1 (f) Commonwealth marine area

No Commonwealth marine areas were identified by the EPBC search.

Nature and extent of likely impact

Address any impacts on any part of the Commonwealth marine area

N/A

3.1 (g) Commonwealth land

Description

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

Ranger mine and the RPA are on land belonging to the Kakadu Aboriginal Land Trust, and ERA has agreed access in accordance with the *Aboriginal Land Rights (Northern Territory) Act 1976*. Conditions are attached to the agreement, including compliance with the Environmental Requirements attached to the Section 41 Authority. ERA's tenure for the RPA comes from the Section 41 Authority issued under the *Atomic Energy Act 1953* which allows mining and milling activities at Ranger until 2021.

ERA also holds an Authorisation issued under Section 38(2) of the *Mining Management Act (NT)* (the Ranger Authorisation) which specifies the operations that ERA can conduct within the RPA.

Nature and extent of likely impact

Address any impacts on any Commonwealth land

Details of the nature and likely impact of the current Ranger operations and proposed heap leach facility are set out in Section 3.1.2 in relation to the World Heritage Kakadu National Park surrounding the RPA.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area; or
- will be taken on Commonwealth land.

Your assessment of impacts should refer to the [*Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies*](#) and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	Is the proposed action a nuclear action?		No
		X	Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

Section 3.1.2 outlines the nature and extent of the likely impacts on the whole environment which also apply to activities identified as nuclear actions.

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

Provide a description of the following features of the project area and the affected area.

The general setting for the project is described below.

3.3 (a) Soil and vegetation characteristics

Geology

The Ranger operation and the RPA lie in the north-easternmost part of the Pine Creek Geosyncline. Uranium mineralisation occurs within a lower Proterozoic metasedimentary sequence (Cahill Formation) of gneisses, schists and carbonates above lower Proterozoic gneisses and schists of the upper Nanambu Complex. The mineralisation is confined to structures dominated by low-angle imbricate thrusts with zones of brecciation and veinlet networks.

Orebody #3 is located along a roughly east-west line and dips from the west to the east to depth. Rock units being mined from Pit #3 include the Cahill Formation, the overlying and younger Kombolgie Formation, various intrusive rocks, so-called 'laterite' which is a complex of weathered rock units near the landsurface, and surficial sediments and soils. In the mine pit, the Cahill Formation is divided into *Lower Mine Sequence*, *Upper Mine Sequence* and *Hanging Wall Sequence*.

Uranium mineralisation is dominantly found as finely disseminated uraninite (UO₂), although there are a number of minor primary and secondary uranium minerals also present in parts of the sequence, including the weathered materials ('laterite') near the landsurface.

Climate

The climate of the region is typical of the wet-dry tropics with the large majority (approximately 80%) of annual rainfall occurring in the months November to March. Rainfall is often intense and commonly exceeds 25 mmh⁻¹ over short duration events reaching intensities of around 120 mm h⁻¹ in a five minute duration with probable annual occurrence. Monsoonal rain tends to be less intensive but more prolonged than that associated with convective storms.

Mean annual rainfall at Jabiru Airport (1971–Nov 2008) is 1,583 mm; the average pan evaporation at Jabiru Airport (1971–2006) is 2,557 mm. Humidity ranges from around a daily average of 24% in July to 80% in December. Winds are predominantly from the south-east and east from April–September, giving rise to cooler weather (mean monthly minimum of 18°C in July at Jabiru airport). Westerly and northerly winds prevail during the wet season from November–February (mean monthly maximum temperature of 32°C in January at Jabiru Airport) with March and October tending to be transitional months with variable wind direction.

Land systems, land units and soils

The RPA is located within an extensive undulating landscape of broad, shallow valleys, long low-angle slopes and isolated hills of the *Koolpinyah Surface*. To the east and south is the escarpment of the Arnhem Plateau composed of Kombolgie Formation sandstones and quartzites (Fig 7). Whilst the soils of the plateau are skeletal, the Koolpinyah Surface is characterised by surficial sandy deposits which cover extensive tracts of 'laterite' and 'lateritic soils', including ferruginous crusts, nodules and pisolitic deposits which reflect many pedogenic cycles. The main soil types on the RPA and in the vicinity of the current Ranger operations are red earths, yellow earths, siliceous sands and lithosols.

Vegetation characteristics

ERA's leases have been divided into 4 broad habitats based on 18 detailed vegetation types and a numeric ranking system used to determine which habitat was most likely to contain species of conservation significance. The order of Habitat Ranking from highest to lowest was Sandstone habitat, Lowland Riparian and Rainforest habitat, Woodland habitat and Floodplain habitat. A management matrix outlining potential actions depending on the habitat and area of disturbance has been adopted by ERA.

3.3 (b) Water flows, including rivers, creeks and impoundments

3.3.1 Hydrology – general description

The current operations area is bounded on the north by Magela Creek, a major system which drains the Arnhem Escarpment located to the south-east, and on the west by Gulungul Creek, a tributary to Magela Creek draining escarpment areas located to the south. Both are ephemeral creek systems which flow only during the wet season but constitute significant waterways at this time. Prior to mining, the local hydrology included four separate sub-catchments, namely Gulungul to the west and southwest, Coonjimba in the centre west, Djalkmara in the centre east, and Corridor Creek in the east and south (Fig 8). All eventually drained into Magela Creek. The undulating landscape typically comprised slopes of between 1 to 4%, with hill crests around 20m above the Magela Creek bed levels.

Water quality monitoring by ERA and the SSD in surface water systems on and around the operations since mining commenced in 1979 has generated a large database of historical data and analysed patterns and trends in water quality.

The degree and extent of weathering is the most significant control on the occurrence and movement of groundwater in the shallower aquifers at Ranger, with water levels closely reflecting seasonal rainfall patterns and groundwater flow gradients strongly influenced by topography. In the deeper aquifers, geological structures and zones of fracturing and faulting are more significant controls, and strongly influence groundwater level responses to rainfall-recharge in overlying units. Strong compartmentalisation of flow is evident and deep and shallow aquifers typically show little or no hydraulic connection. Water quality data in the deeper aquifers suggest that groundwater level responses are essentially 'pressure-responses' to changes in groundwater

levels within overlying units. Groundwater level variations and flow patterns in upstream areas are more complex than those observed in downstream areas, suggesting greater local anisotropy and the presence of discrete permeable zones in elevated areas.

3.3 (c) Outstanding natural features, including caves

There are no outstanding natural features on the Ranger mine site or the RPA. The Arnhem Escarpment dominated by Mount Brockman, a significant cultural feature, occurs approximately 2km south of the southernmost limit of the RPA.

3.3 (d) Gradient

The Ranger operations are situated within an extensive landscape of broad shallow valleys, long low-angle slopes and isolated hills forming the Koolpinyah Surface. Generally, the elevation over the current operations area ranges from between 40m at the highest points to 10 – 12m in Magela Creek. The gradient is between 1 to 4 per cent with some isolated, steeper sections varying in height to as much as 38m above the Magela Creek bed level. The slopes are surfaced by medium to coarse sand and some gravel. Drainage from south, east and north of the current operations runs into Magela Creek, and from the southwest and west into Gulungul Creek and then into Magela Creek.

3.3 (e) Buildings or other infrastructure

The existing buildings and other infrastructure in the Ranger operations area include:

- the mill area comprising power station (which also provides power to the township of Jabiru), processing plant, administration and maintenance facilities;
- the ~100 ha tailings dam (used for tailings discharge until 1996, then acting as a water storage and evaporation basin, and returned to combined tailings and process water storage in 2009);
- the two mine pits (Pit #1, which was mined out in 1994 and been used for tailings storage since 1996 until 2009, and Pit #3, which is currently being mined);
- ore and waste rock stockpiles;
- a number of retention ponds and constructed wetland filters for management of seepage and runoff during the wet season, and storage of waters during the dry season;
- water treatment plants;
- irrigation areas for disposal of pond water (treated and untreated) during the dry season;
- access road and service tracks; and
- the Jabiru airport and associated infrastructure, which includes Commonwealth buildings on land leased from ERA, tourist facilities, a workshop owned by the Gagudju Association on land leased from ERA, and a temporary contractor camp.

3.3 (f) Marine areas

There are no marine areas near the Ranger mine site. Creeks draining the escarpment and lowlands traverse ERA's leases and Kakadu National Park and eventually emerge at the northern Australian coastline. Downstream marine water quality is protected by meeting the water quality management requirements outlined in the Ranger Authorisation.

3.3 (g) Kinds of fauna & flora

Please see Section 3.1.2.3.

3.3 (h) Current state of the environment in the area

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

The operating Ranger mine site is a substantially disturbed area in the south-western corner of the Ranger Project Area. Since the commencement of construction of the mine in 1979, environmental management of the

site has been carried out in accordance with current authorisations and approvals. Oversight of the effectiveness of ERA's environmental management is undertaken by the Supervising Authority (Northern Territory Department of Regional Development, Primary Industry, Fisheries and Resources) in the context of the MTC (chaired by RDPIFR and including representatives of OSS, ERA, NLC and GAC) and advice from the Commonwealth SSD.

Notwithstanding disturbance due to mining, ERA has continued to manage the Ranger mine site effectively and in a manner that has enabled the environment surrounding ERA's operations to remain protected.

Areas on the RPA immediately surrounding the Ranger operations are little-disturbed and contain intact habitats and ecosystems.

3.3 (i) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

As described earlier in this document, the Ranger mine site is located in the southern part of the RPA which is separate from but surrounded by Kakadu National Park. Kakadu National Park is an area of National and World Heritage significance. Large areas of Kakadu are listed as wetlands of international importance under the Ramsar Convention (including areas used by migratory shorebirds). Numerous migratory species that occur in Kakadu are protected under international agreements such as the Bonn Convention for conserving migratory species, and Australia's migratory bird protection agreements with China (CAMBA) and Japan (JAMBA). Kakadu is also part of a Tri-National Wetlands Conservation Project which operates under an agreement between the Director of National Parks and the management authorities of Wasur National Park in Irian Jaya and Tonda Wildlife Management Area in Papua New Guinea.

The cultural sites of Kakadu National Park exhibit several key attributes, including the fact that they are of great significance to Aboriginal people, of great antiquity and have a continuous temporal span from the Pleistocene Epoch until the present, that they exhibit great diversity in space and time and yet represent continuous cultural development, and that the cultural tradition demonstrated in the art and archaeological record is a living tradition that continues today.

There are numerous archaeological and cultural heritage sites on the Ranger Project Area. However, ERA has been advised by the Aboriginal Areas Protection Authority that there are no registered sites on the RPA. Archaeological clearance surveys have been conducted by the Traditional Owners over approximately 44% of the RPA. Surveys are continuing over the balance of areas that may be impacted by expansion activities. Facilities will be sited to avoid identified archaeological and heritage sites wherever practicable. Any disturbance will be conducted under the requirements of the *Heritage Conservation Act 1991* (NT), and in agreement with the GAC.

A cultural heritage management system has been implemented and an Interim Protocol regarding cultural heritage management on the RPA has been developed in collaboration and agreement with GAC.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

ERA holds an Authority issued by the Federal Minister for Resources under Section 41 of the *Atomic Energy Act 1953* (Cth), permitting ERA to conduct mining and processing operations on the Ranger Project Area until January 2021. The Traditional Owners of the land in and surrounding the RPA are the Mirarr people, and the RPA is Aboriginal land. ERA's operations are therefore conducted subject to and in accordance with Agreements made under section 44 of the *Aboriginal Land Rights (Northern Territory) Act 1976* between the Commonwealth and the NLC, as representatives of the Traditional Owners.

3.3 (k) Existing land/marine uses of area

The RPA is about 78 km² in area. Approximately 70% of the RPA is relatively undisturbed.

The operating Ranger mine site is located in the south-western part of the RPA.

Other facilities within the disturbed areas of the RPA, adjacent to and associated with the mining operations on the Ranger Mine site, include the Jabiru airport and associated service and tourist facilities, the Gagudju Association workshop, a temporary camp occupied by ERA contractors, a field station belonging to the

Commonwealth's Supervising Scientist Division, former ERA nursery and environmental workshops, and land once occupied by the NT Mines Department.

3.3 (I) Any proposed land/marine uses of area

There are no other known or proposed land/marine uses of the area.

4 Measures to avoid or reduce impacts

The Minister for the Environment, Heritage and the Arts may decide that a proposed action is not a controlled action if the action will be undertaken in a particular manner that will ensure that any potential significant impacts are avoided or reduced by mitigation measures to the extent that they will not be significant (Subsection 77A(1) of the EPBC Act).

To be considered, any such measures must:

- clearly form part of the referral (eg be identified in the referral form and fall within the responsibility of the person proposing to take the action),
- be concrete and prescriptive, and
- be clearly effective in avoiding or mitigating significant impacts.

Examples of relevant measures to avoid or reduce impacts may include the timing of works to avoid critical periods for listed species, avoidance of habitat important for listed species from direct and indirect impacts, application of specific design measures to avoid or reduce impacts, or adoption of specific work practices to reduce or avoid impacts.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making a decision on significance (but are relevant at the assessment and approval stages if your project proceeds to these stages).

Refer to the [Guideline on Particular Manner Decisions](#) under the EPBC Act available at the Department's web site.

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For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is
- how the measure is expected to be effective
- the timeframe or workplan for the measure.

The potential impacts of the proposed action will be managed and mitigated using the existing ERA systems and procedures already required by the Ranger Authorisation to ensure compliance with the ERs (see also schedule 3). For the past 29 years of operations, these systems and procedures have been monitored and enforced by the Northern Territory and Commonwealth regulators.

The key system components and specific commitments to avoid or reduce impacts relevant to the proposed action are:

Low grade ore leach facility

Environmental controls for the low grade ore leach facility will include:

- construction of the heap leach and residue storage facilities, with surrounding catchment berms, drainage controls and monitoring systems;
- lining with leak detection for leach pads, pond and channel liners;
- the construction of perimeter berms around the operating heap and pond areas;
- elimination of misting of leach solution by using appropriately designed low pressure dripper systems;
- the containment of residues in appropriate temporary and permanent storage facilities; and
- a storm water system, integrated with the existing Ranger water management system, sized to hold the entire volume of free solution in the operating heap plus the rainfall from storm events, to supplement the combined volume of the four process liquor ponds.

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. significant impacts on the matters protected under the Act are likely) and the reasons why. If you think that the action is a controlled action, you must also identify the relevant protected matters in section 5.3. (An action is a controlled action if it has, will have, or is likely to have a significant impact on a matter protected by a provision of Part 3 of the EPBC Act).

5.1 Do you THINK your proposed action is a controlled action?

☐	No, complete section 5.2
☒	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is not a controlled action (ie. **NOT LIKELY** to have significant impacts).

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) of the EPBC Act that you think are likely to be impacted (controlling provisions).

Matters likely to be impacted

☒	sections 12 and 15A (World Heritage)
☒	sections 15B and 15C (National Heritage places)
☒	sections 16 and 17B (Wetlands of international importance)
☒	sections 18 and 18A (Listed threatened species and communities)
☐	sections 20 and 20A (Listed migratory species)
☒	sections 21 and 22A (Protection of the environment from nuclear actions)
☐	sections 23 and 24A (Marine environment)
☐	sections 26 and 27A (Protection of the environment from actions involving Commonwealth land)
☐	section 28 (Protection of the environment from Commonwealth actions)
☐	sections 27B and 27C (Commonwealth Heritage places outside the Australian Jurisdiction)

Specify the key reasons why you think the proposed action is a controlled action (ie. **LIKELY** to have significant impacts).

The proposed action, involving the construction of a low grade ore leach facility, will represent an intensification of mineral processing activity on the existing mine site and disturbed areas within the RPA. This intensification without appropriate controls has the potential to have an impact on the attributes of the surrounding Kakadu National Park and some listed species. However, ERA considers that the existing comprehensive and complex regulatory and operating controls and the supervision over the Ranger operations prescribed by the Commonwealth's Environmental Requirements attached to the Ranger Section 41 Authority and set out in detail in the Ranger Authorisation will ensure that appropriate controls are in place to effectively manage and mitigate any potential for additional risks to the surrounding environment.

6 Environmental history of the responsible party

NOTE: If a decision is made that a proposal needs approval under the Act, the Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach for actions that need approval under the Act.

	Yes	No
6.1 Does the party taking the action have a satisfactory record of responsible environmental management? Provide details Ranger uranium mine operates under a comprehensive and complex suite of environmental regulations and has been recognised for its world-class environmental management system, first achieving certification under ISO 14001 in December 2003. In September 2005, ERA's Safety Management System was certified as being compliant with the requirements of Australian Standard AS4801 OHS Management System. Certification has been maintained since that time. The Radiation Management System (RMS) developed by ERA is part of that certification. Annual reporting requirements are comprehensive, and include Wet Season Reports (detailing water management and water quality evaluations), Environment Reports (general operations), Plans of Rehabilitation, and Radiation and Atmospheric Monitoring. Since 2000, ERA has provided regulators and stakeholders with information on all environmental incidents or events which: • could result in significant risk to ecosystem health; or • has the potential to cause harm to people living or working in the area; or • is of or could cause concern to Aboriginals or the broader public as they occur at Ranger. The regulators, including the Supervising Authority and the Commonwealth's Supervising Scientist Division investigate all such incidents or events. Monthly inspections of the mine operations are carried out by regulators and stakeholders (Routine Periodic Inspections), and an annual stakeholder audit is also undertaken. These programs are focussed on environmental management and environment protection systems. The annual reports of the Supervising Scientist to the Commonwealth Minister for the Environment have consistently stated that Ranger mine has been operating since 1979 without significant impact or lasting environmental detriment to the surrounding environment of the World Heritage listed Kakadu National Park⁷.	X	
6.2 Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources? If yes, provide details 1. On 6 May 2005, ERA pleaded guilty to two offences under Section 39 of the Northern Territory <i>Mining Management Act</i> for two separate breaches of the Ranger Authorisation, in respect of an incident involving the connection of the drinking and process water systems at the Ranger uranium processing plant in March 2004, and separate incidents involving the radiation clearance of certain mobile equipment between November 2003 and March 2004. ERA was convicted and fined \$75,000 for each of the two offences.	X	

⁷ Refer SSD website for a full assessment of ecology impacts arising from incidents at the Ranger mine from 1979 to April 2007: (<http://www.environment.gov.au/ssd/uranium-mining/supervision/ecol-assess-incidents.html>)

	Yes	No
2. On 28 September 2005. ERA was prosecuted by the Northern Territory's Department of Business, Industry and Resource Development under Section 23 (4), Safety and Health Offences, of the Northern Territory's Mining Management Act. ERA pleaded guilty and was fined \$82,500.		
6.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework? If yes, provide details of environmental policy and planning framework ERA's Environmental Policy is attached (see Schedule 3). In addition, ERA's Environmental Management System has been certified to ISO 14001 since 2003.	X	
6.4 Has the person proposing to take the action previously referred an action under the EPBC Act? Provide name of proposal and EPBC reference number (if known) Ranger uranium mine: Transportation of concentrated sulphuric acid through Kakadu National Park (2006): determined Not a Controlled Action.	X	

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

Bureau of Meteorology (2008). Climate statistics for Australian locations. http://www.bom.gov.au/climate/averages/tables/cw_014198.shtml

Commonwealth of Australia (2008). *Atomic Energy Act 1953* [http://www.comlaw.gov.au/ComLaw/Legislation/ActCompilation1.nsf/0/91A0C1A4970C524DCA2574870082C73D/\\$file/AtomicEnergy53.pdf](http://www.comlaw.gov.au/ComLaw/Legislation/ActCompilation1.nsf/0/91A0C1A4970C524DCA2574870082C73D/$file/AtomicEnergy53.pdf)

Firth, RSC (2003) Activity range and den trees of the brush-tailed rabbit-rat on Cobourg Peninsula, Northern Territory, Australia. In 'Rats, Mice and People: Rodent biology and Management'. (Eds. GR Singleton, LA Hinds, CJ Krebs and DM Spratt.) pp. 99-102. (Australian Centre for International Agricultural Research Canberra.)

Firth, RSC, Jefferys, E, Woinarski, JCZ, & Noske, RA (2005) The diet of the brush-tailed rabbit-rat (*Conilurus penicillatus*) from the monsoonal tropics of the Northern Territory, Australia. *Wildlife Research* **32**, 517-523.

Firth, RSC, Woinarski, JCZ, & Noske, RA (2006a) Home range and den characteristics of the brush-tailed rabbit-rat (*Conilurus penicillatus*) in the monsoonal tropics of the Northern Territory, Australia. *Wildlife Research* **33**, 397-407.

Firth, RSC, Woinarski, JCZ, Brennan, KG, & Hempel, C (2006b) Environmental relationships of the brush-tailed rabbit-rat *Conilurus penicillatus* and other small mammals on the Tiwi Islands, northern Australia. *Journal of Biogeography* **33**, 1820-1837.

Firth, RSC, Woinarski, JCZ, Brennan, KG, & Low Choy, J (2008a submitted) Environmental relationships of the threatened brush-tailed rabbit-rat, *Conilurus penicillatus*, from two mainland conservation reserves in northern Australia and comparisons with an island population. *Austral Ecology*.

Firth, RSC, Brook, BW, Woinarski, JCZ, & Fordham, DA (2008b submitted) Population viability of a threatened northern Australian native rodent, the brush-tailed rabbit-rat *Conilurus penicillatus*. *Biological Conservation*.

Kemper, CM & Firth, RSC (2008) Brush-tailed Rabbit-rat, *Conilurus penicillatus* (Gould, 1842) In: *The Mammals of Australia Third Edition*. (Eds. S Van Dyck & R Strahan).

Kerle, J A, and Burgman, MA (1984). Some aspects of the ecology of the mammal fauna of the Jabiluka area, Northern Territory. *Australian Wildlife Research* **11**, 207-222

NRETAS (2009) Sites of conservation significance in the Northern Territory. www.nt.gov.au/nreta/environment/conservation

NRETAS (2009) Threatened species of the Northern Territory – *Hibiscus brennanii*. www.nt.gov.au/nreta/wildlife/animals/threatened/pdf/plants/Hibiscus_brennanii_VU.pdf

Oakwood, M (2004). The effect of cane toads on a marsupial carnivore, the northern quoll, *Dasyurus hallucatus*. Report to Parks Australia (Envirotek, Nana Glen).

Phillips, B L, & Shine, R (2005). The morphology, and hence impact, of an invasive species (the cane toad, *Bufo marinus*) changes with time since colonisation. *Animal Conservation* **8**, 407-413.

Ranger Authorisation (2008). Northern Territory Mining Management Act Authorisation 0108-10. April 2008.

Smith, JG, & Phillips, BL (2006). Toxic tucker: the potential impact of cane toads on Australian reptiles. *Pacific Conservation Biology* **12**, 40-49.

Supervising Scientist (2001) Annual Report 2000 – 2001. (Supervising Scientist, Darwin). 94pp.
<http://www.environment.gov.au/ssd/about/corporatedocs.html>

Supervising Scientist Division (2008). Full assessment of ecology impacts arising from incidents at the Ranger mine from 1979 to April 2007: <http://www.environment.gov.au/ssd/uranium-mining/supervision/ecol-assess-incidents.html>.

Supervising Scientist Division (2008). Supervising Scientist Environmental Monitoring Program
<http://www.environment.gov.au/ssd/monitoring/index.html>

Woinarski, J (2006) Partridge Pigeon (eastern subspecies) *Geophaps smithii smithii*. Threatened species of the Northern Territory. Department of Natural Resources, Environment and the Arts, Northern Territory Government

Woinarski, J, Pavey, C, Kerrigan, R, Cowie, I & Ward, S eds. (2007). Lost from our Landscape. Northern Territory Department of Natural Resources the Environment and the Arts.

7.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

The information is based on the references in Section 7.1 and findings from field surveys conducted by specialist environmental consultants over a period of 29 years, with the most recent surveys occurring in 2008.

The field survey work was conducted in accordance with recognised professional survey methods and practices. The published documents cited in this referral are considered reliable and credible. The information has been subject to technical review by specialist environmental consultants.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1 & 2)	✓	Fig 1: ERA leases & Ranger mine in the Alligator Rivers Region of the Northern Territory in relation to geographic & geomorphic features of the landscape Fig 2: Location of ERA leases in relation to Darwin, Kakadu National Park & Arnhem Land Fig 3: Current operations showing approximate boundary of area of surface & subsurface disturbance Fig 4: Provisional site layout – heap leach facility and ancillary infrastructure. Final layout to be developed during the EIA process.
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Fig 5: Recent biodiversity survey locations on ERA's Ranger and Jabiluka leases Fig 6: Recordings of listed species of conservation significance on the Ranger and Jabiluka leases Fig 7: Broad-scale geology (BMR interpretation, 1980) Fig 8: Pre-mining surface water catchments
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Schedule 2: MNES Report, 27 February 2009
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	Schedule 1: Ranger Authorisation 0108-10 (April 2008) Schedule 3: ERA's Environmental Policy
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action; or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action^{*1}.

Project title: Heap leach facility for Energy Resources of Australia Ltd's Ranger uranium mine

8.1 Person proposing to take action

This is the individual, body politic or body corporate that will be principally responsible for, or who will carry out, the proposed action. The Minister may also request additional information from this person, for the purposes of deciding whether the action is a controlled action, the controlling provisions that apply, and for the making of an approval decision (if applicable).

If approval for the action is required and is granted, it will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions of approval.

If the Minister decides that the action is a controlled action, the Minister must also designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action^{*2}.

Name Rob Atkinson

Title Chief Executive

Organisation Energy Resources of Australia Ltd

ACN / ABN (if applicable) 71 008 550 855

Postal address GPO Box 2394, DARWIN NT 0801

Telephone 08 8924 3500 FAX: 08 8924 3555

Email newprojects@era.riotinto.com

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.

Signature



Date

12 March 2009

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name Dr A R Milnes

Title General Manager Environmental Strategy

Organisation Energy Resources of Australia Ltd

Postal address GPO Box 2394, DARWIN NT 0801

Telephone 08 8947 5756

Email newprojects@era.riotinto.com

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature



Date

12 March 2009

^{*1} If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed.

However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

**2 If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

If the referring party is a small business (fewer than 20 employees), estimate the time, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

Hours	Minutes

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ☒ Completed all required sections of the referral form?
- ☒ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ☒ Provided a map showing the location and approximate boundaries of the project area?
- ☒ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ☒ Provided complete contact details and signed the form?
- ☒ Provided copies of any documents referenced in the referral form?
- ☒ Ensured that all attachments are less than two megabytes (2mb)?
- ☒ Sent the referral to the Department (electronic and hard copy preferred)?

FIGURES

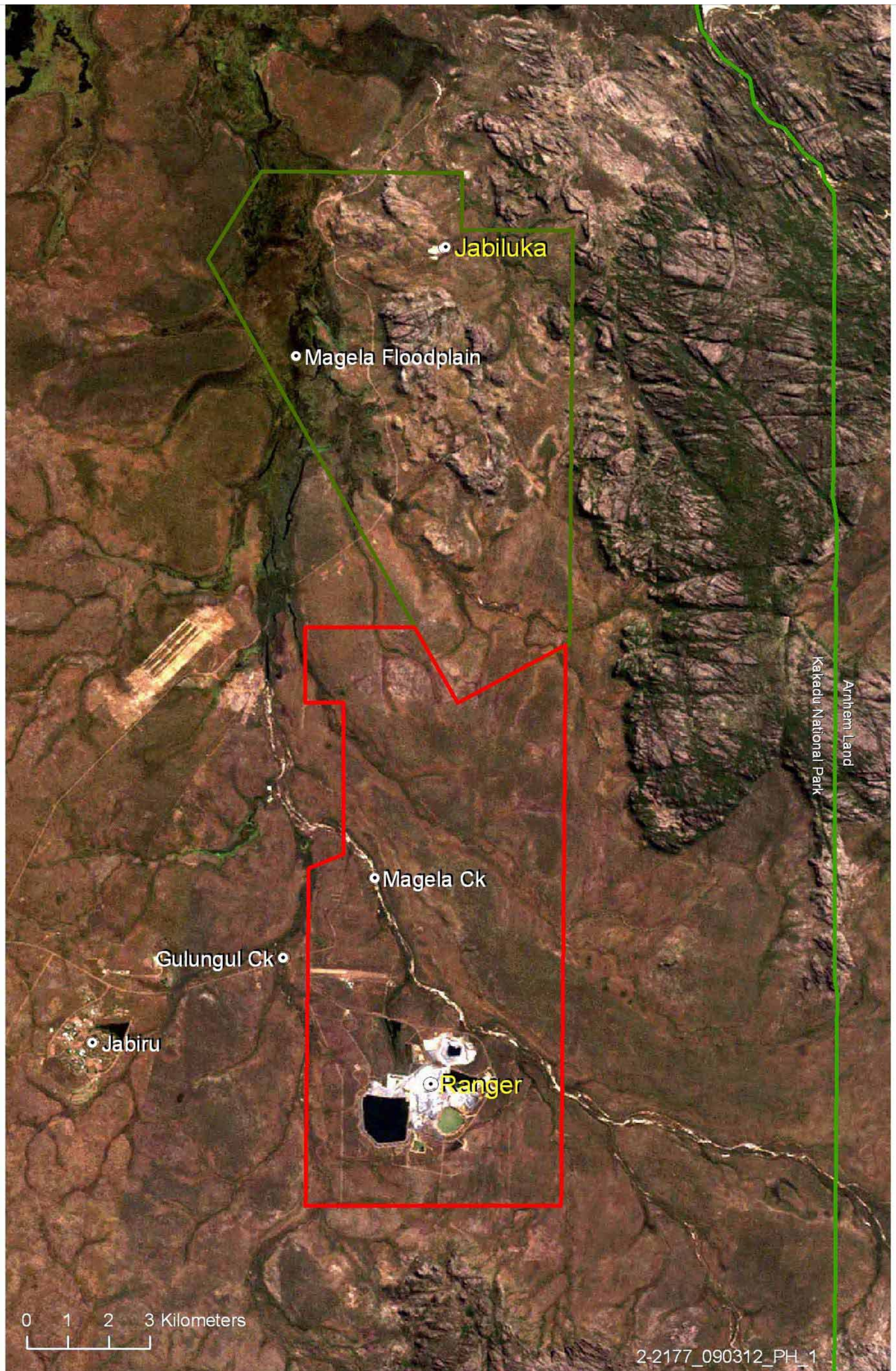


Fig 1: ERA leases & Ranger mine in the Alligator Rivers Region of the Northern Territory in relation to geographic & geomorphic features of the landscape

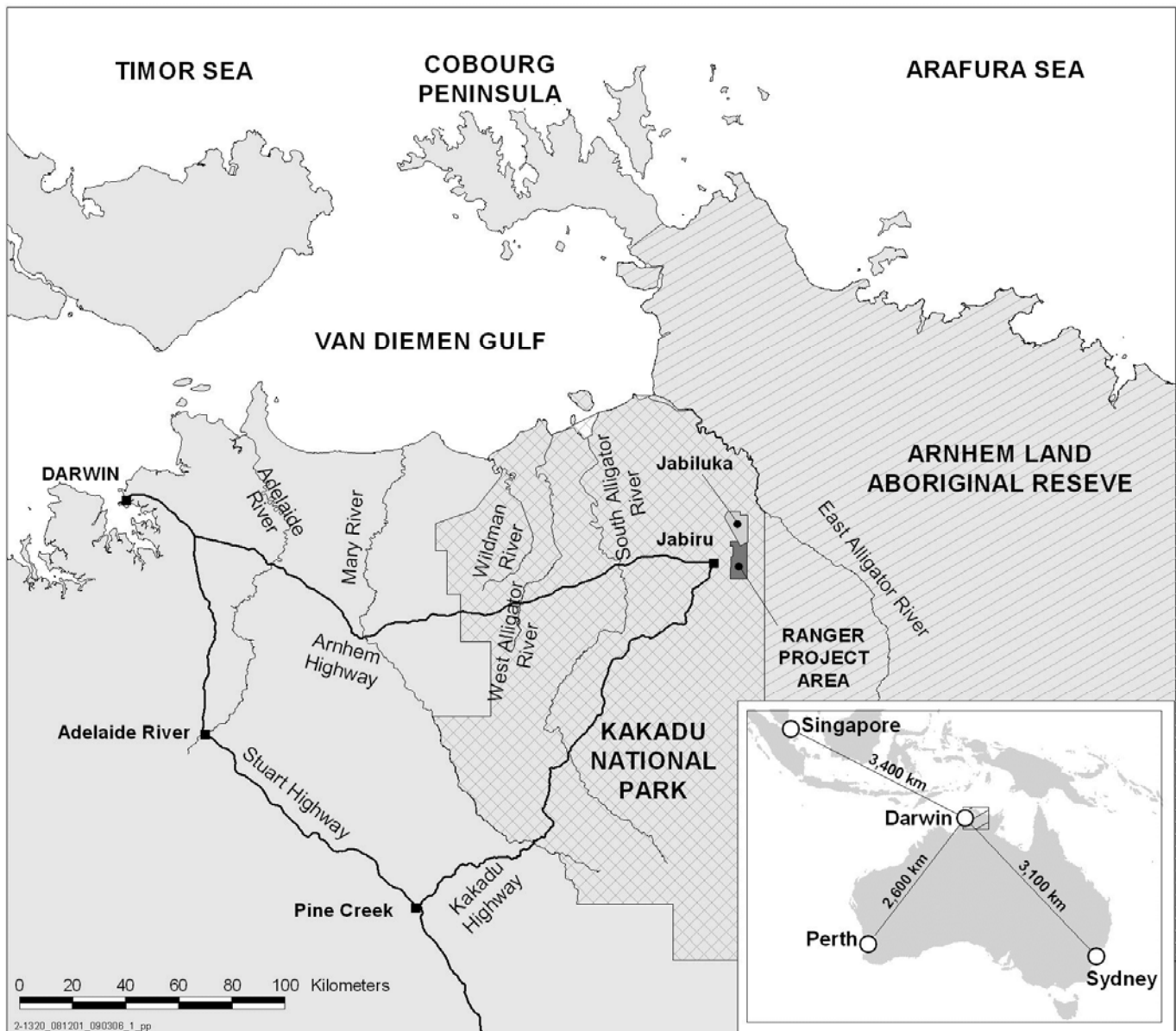


Fig 2: Location of ERA leases in relation to Darwin, Kakadu National Park & Arnhem Land

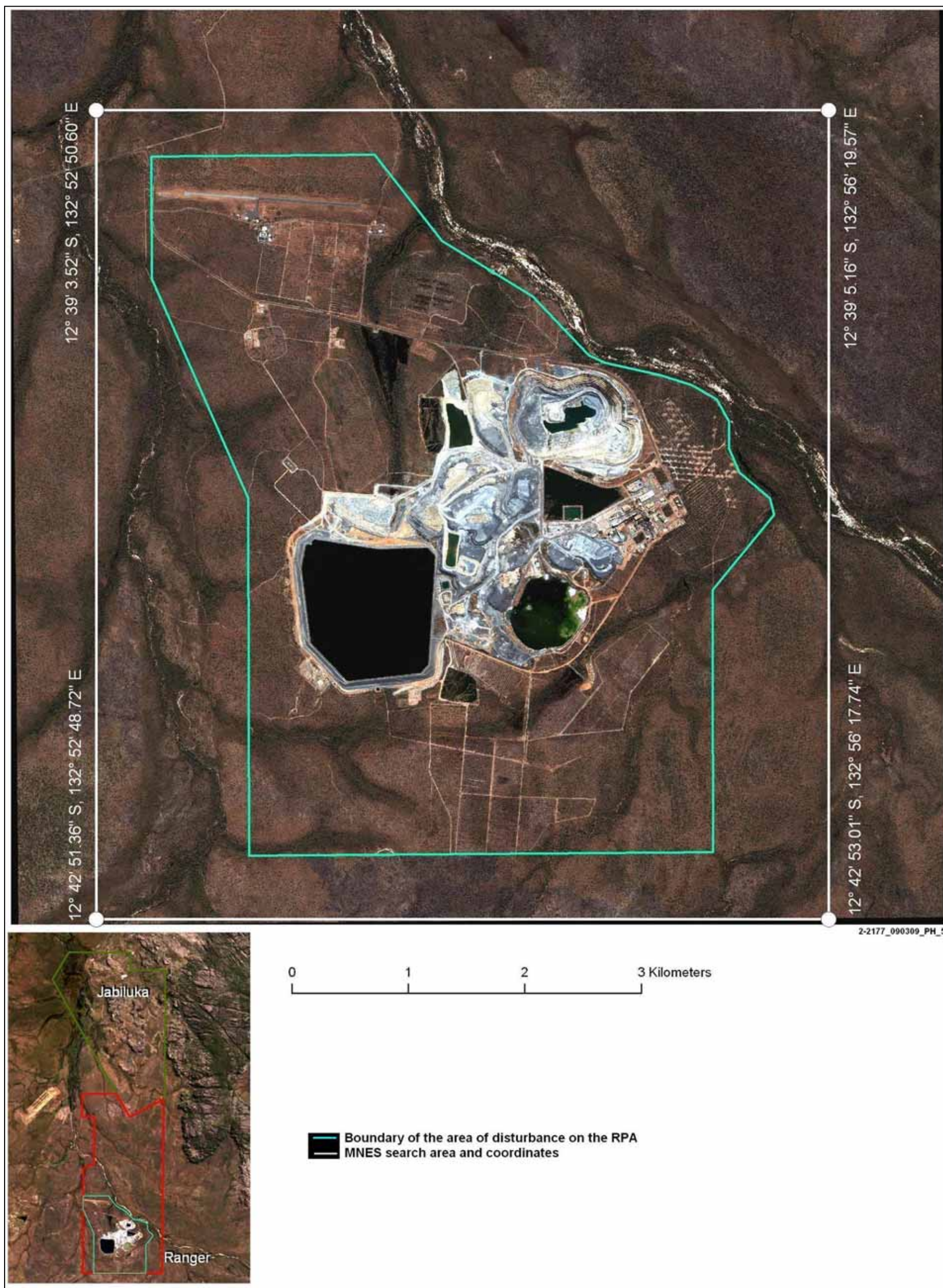


Fig 3: Current operations showing approximate boundary of area of surface & subsurface disturbance

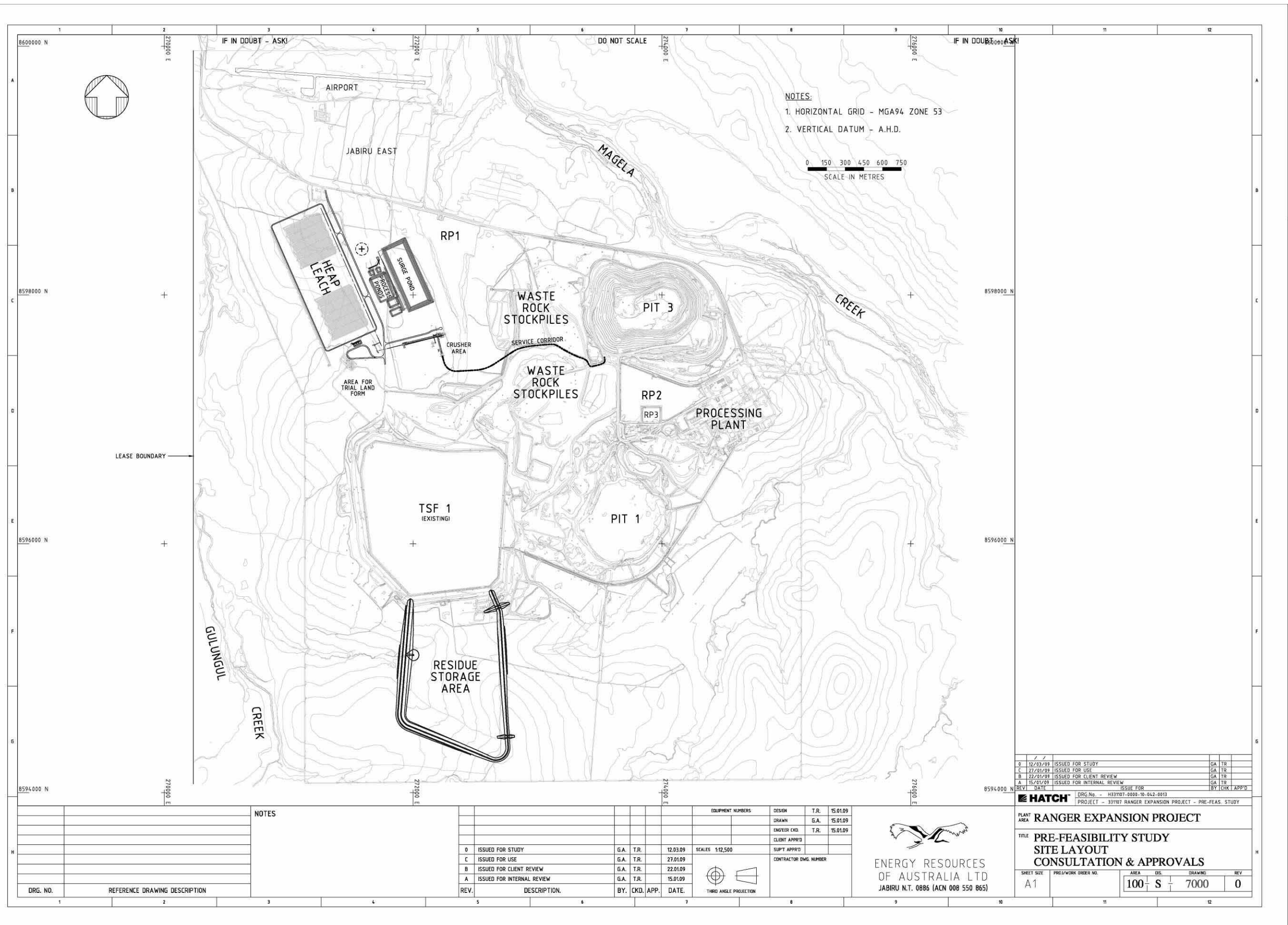


Fig 4: Provisional site layout – heap leach facility and ancillary infrastructure. Final layout will be developed during the EIA process.

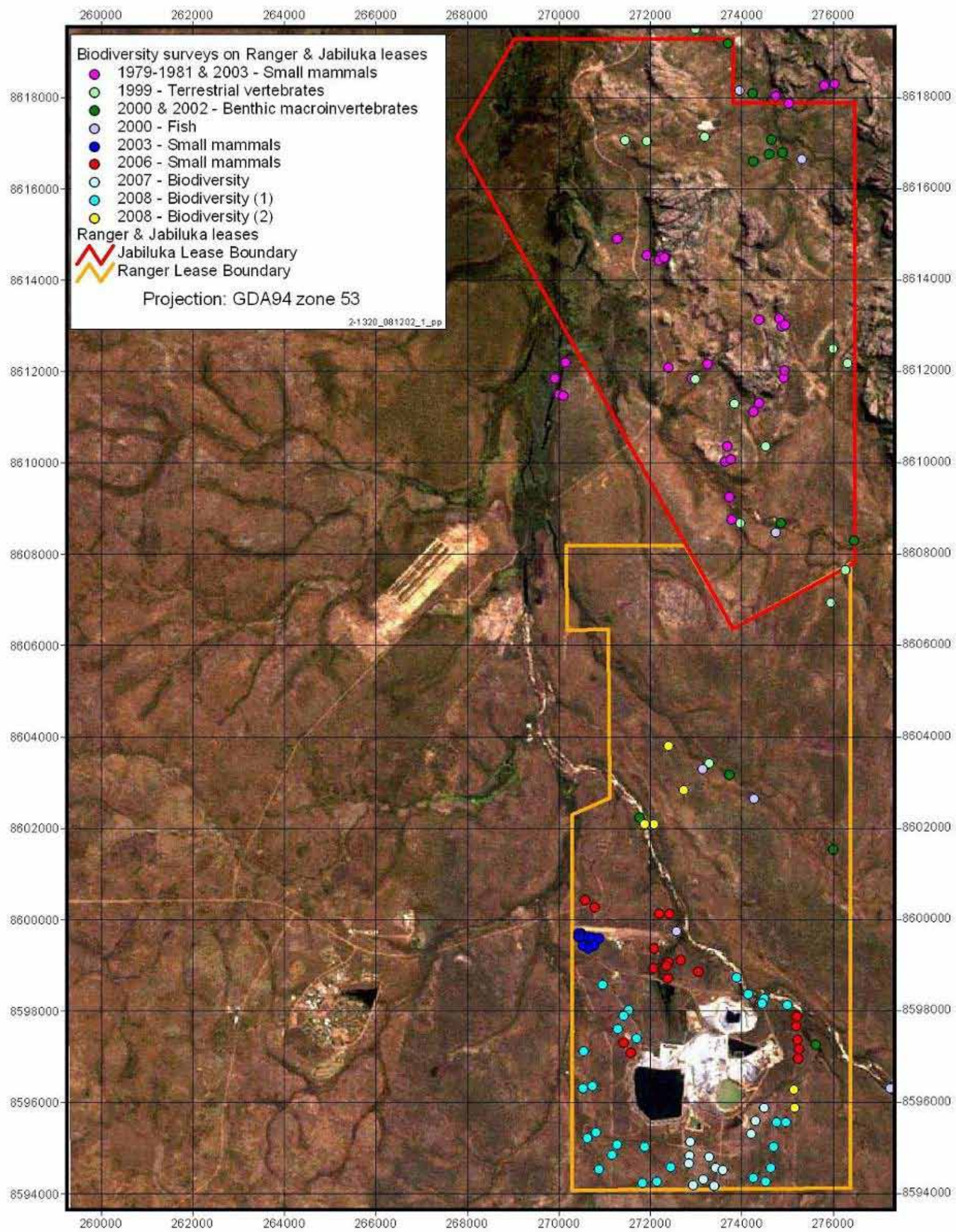


Fig 5: Recent biodiversity survey locations on ERA's Ranger & Jabiluka leases

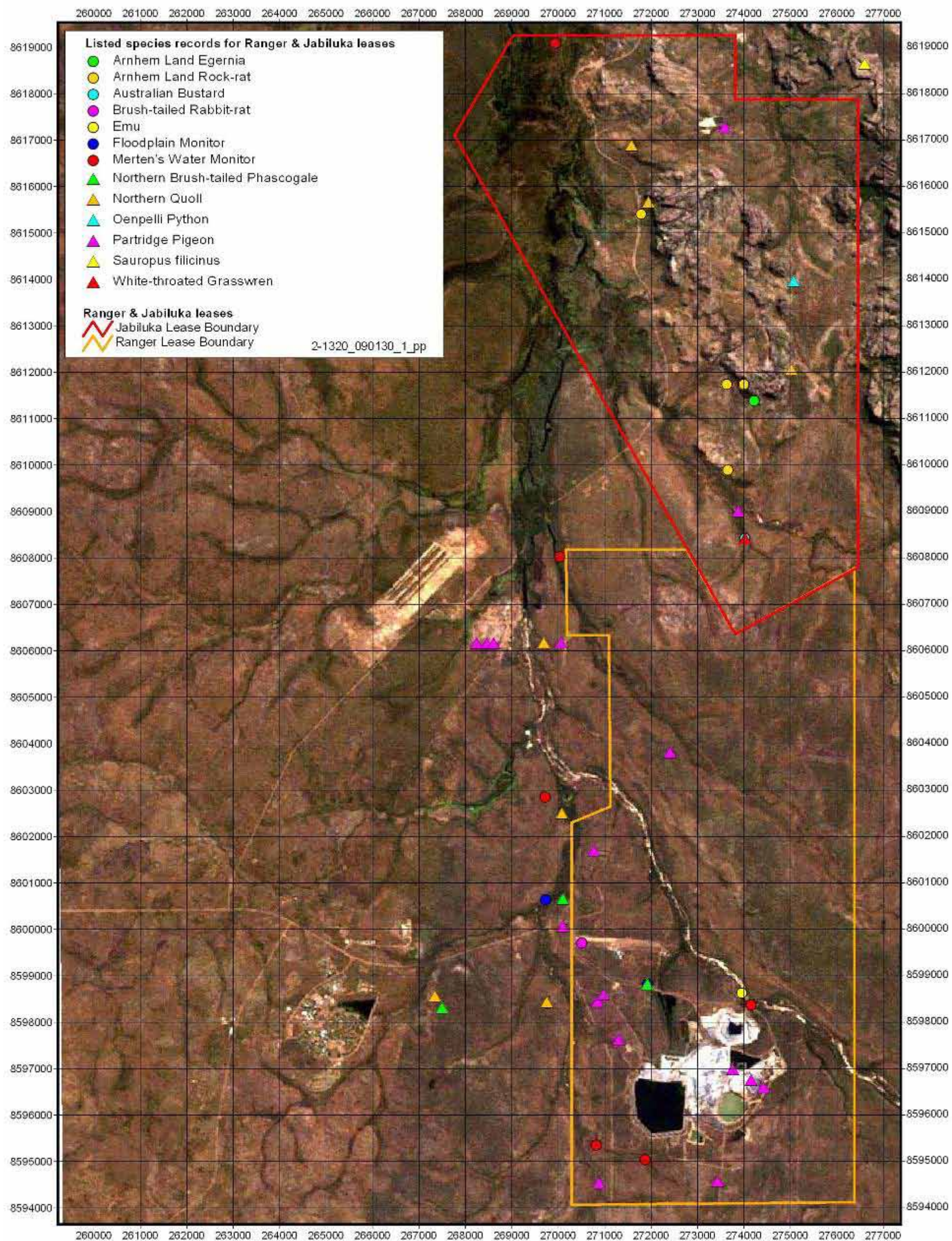


Fig 6: Recordings of listed species of conservation significance on the Ranger & Jabiluka leases¹

¹ Records are based on baseline flora and fauna surveys conducted in 2007 and 2008, and Natural Resources, Environment, The Arts and Sport (NRETAS) Biological Records Scheme (data as of 2006)



Fig 7: Broad-scale geology (BMR interpretation, 1980)

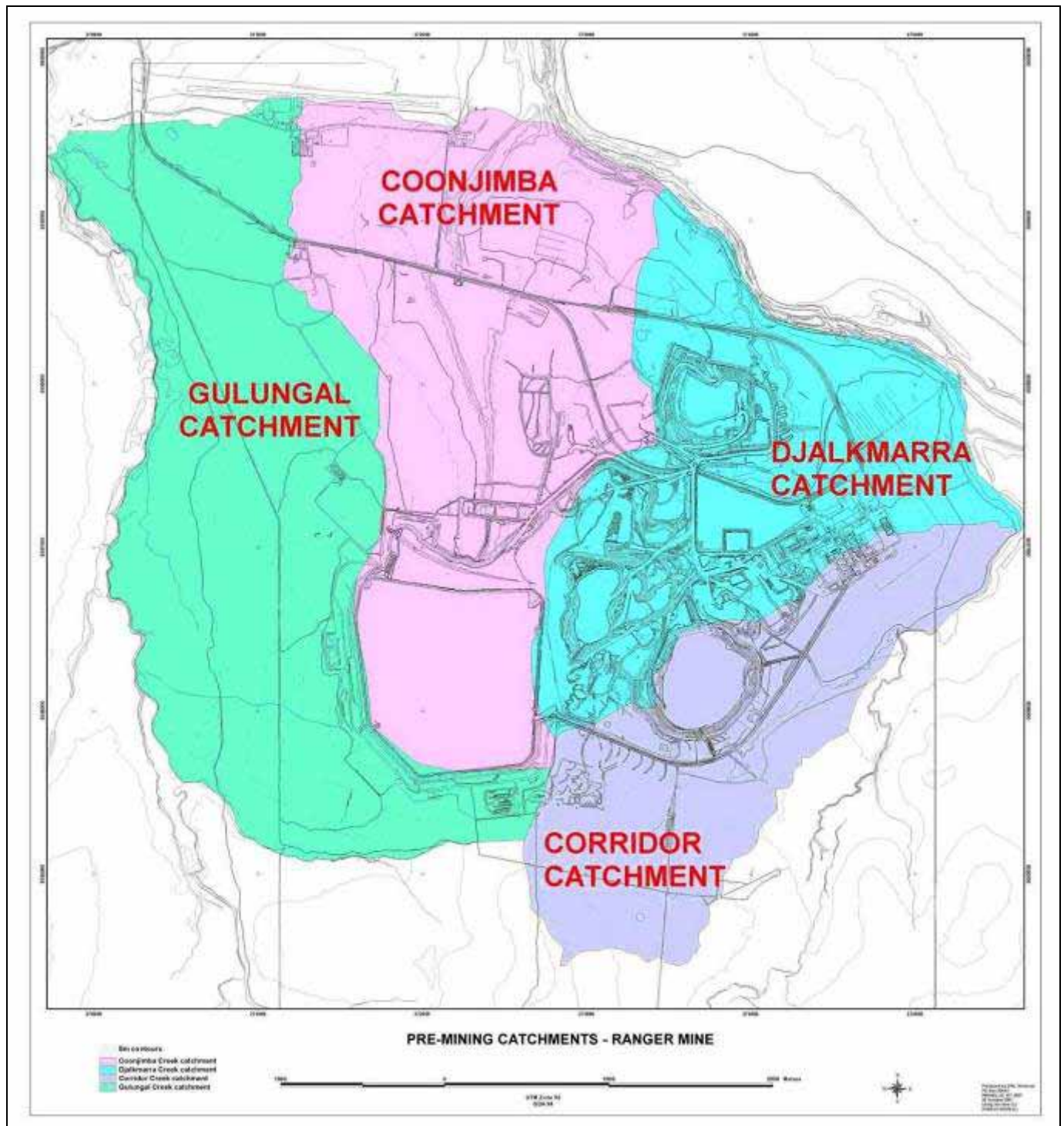


Fig 8: Pre-mining surface water catchments

SCHEDULES

Schedule 1: Ranger Authorisation 0108-10 (April 2008)

Schedule 2: MNES Report, 27 February 2009

Schedule 3: ERA's Environmental Policy