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REFERRAL UNDER THE
ENVIRONMENT PROTECTION ACT
2019

Koongarra Remediation Project



Australian Government

**Department of Climate Change, Energy,
the Environment and Water**

Supervising Scientist

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EXECUTIVE SUMMARY

Project overview

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), Office of the Supervising Scientist (OSS), are proposing to remediate the Koongarra site, a legacy uranium exploration site located in the Kakadu National Park (KNP), 250 kilometres (km) east of Darwin.

The Proposal involves the removal and relocation of the Koongarra Source material, which consists of uranium core samples, core trays and crushed samples, from the Proposal area for temporary storage at the OSS Jabiru Field Station (JFS), located on the Ranger Mine Mineral Lease. The Proposal has three key components:

1. **Access track works** – refurbishment of the existing access track from Kubara Pools carpark to the Proposal area.
2. **Removal of the Koongarra Source** – repackaging the Koongarra Source into 205L sealed drums loaded into sea containers for transportation to the JFS for storage.
3. **Removal of legacy exploration infrastructure** – decommissioning of groundwater bores and exploration drill holes, removal of legacy exploration camp infrastructure such as old sheds, pickets and concrete slabs and transported to an appropriately licensed facility.

Due to limitations on vehicle size that can access the Proposal area, all materials being removed from the site will be transported first to an existing borrow pit (that will be used as a temporary laydown area) approximately 6 km north of the Proposal area on Kubara Road. Here, the sealed drums of drill cores samples will be packed into sea containers and transported for storage at the JFS.

All other legacy exploration infrastructure will be removed from the Proposal area and transported to the laydown area on the Kubara Road for temporary storage prior to being transported to a licensed waste facility.

The Koongarra Source material is regulated and licenced by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and is subject to specific conditions on the handling, transport and storage of the material.

The Proposal will be undertaken over two dry seasons. While no vegetation clearing or soil disturbance will be required, there will be minor, temporary disturbances due to vehicle movement throughout the Proposal area and rehabilitation of the existing Koongarra access track. The footprint that will be subject to these temporary, minor disturbances is 6.55 hectares (ha).

Assessment of potential impacts

Screening identified the potential for significant impacts or uncertainty regarding potential impacts to four of the 14 Northern Territory Environment Protection Authority (NT EPA) environmental factors. This referral report assessed the significance of potential residual impacts on each of the four factors, considering avoidance and mitigation measures. The assessment concluded there will not be a significant residual impact on any of the four factors if the avoidance and mitigation measures outlined in this referral are implemented.

Summary of environmental values relevant to the Proposal, potential impacts and residual impact ratings

Environmental values	Potential impacts	Residual impact significance rating
Terrestrial environmental quality		
<p>Soils within the Proposal area are largely not considered a high erosion risk based on the NT Land Clearing Guidelines (DEPWS 2024). There is an area of steepness on the access track which crosses the Koongarra Saddle that has existing erosion.</p> <p>There is low activity naturally occurring radioactive material onsite that will be removed as part of the Proposal activities.</p>	<ul style="list-style-type: none"> Erosion and soil loss Contamination of soils from spills/leaks during handling, transport and storage of low activity naturally occurring radioactive material 	<p>The Proposal has potential to have a minor impact on Terrestrial Environmental Quality. The Proposal will cause minor soil disturbance to remove infrastructure and due to movement of vehicles throughout the site; however, no land clearing or major soil disturbance is required. Standard erosion and sediment controls will be implemented to mitigate the risks further.</p> <p>The handling and storage of the radioactive materials is regulated by ARPANSA and is subject to specific licence conditions to ensure effective management.</p> <p>Minor</p>
Terrestrial ecosystems		
<p>The Proposal area and access track is a disturbed site populated mainly by grasses with sparse tree cover and surrounded by savanna woodland.</p> <p>Based on the size of the Proposal area, the area has been determined as unlikely to contain critical habitat that supports any threatened flora and fauna species.</p>	<ul style="list-style-type: none"> Loss or degradation of habitat 	<p>The Proposal has potential to have a minor impact on Terrestrial Ecosystems. No land clearing is required, with vegetation disturbance restricted to temporary disturbance of 6.55 ha. Specific controls to mitigate weeds and dust emissions will be implemented.</p> <p>Minor</p>
Culture and heritage		
<p>The Proposal area is in the KNP which is a listed World Heritage Site.</p> <p>The Proposal area and access tracks includes a number of registered sacred sites.</p> <p>There are no sites on the NT Heritage Register.</p>	<ul style="list-style-type: none"> Degradation of sacred sites 	<p>The Proposal has potential to have a minor impact on Culture and Heritage. OSS have obtained an AAPA Certificate to undertake works on the access track and Proposal area. There are specific conditions outlined in the AAPA certificate that will be adhered to in undertaking the Proposed works.</p> <p>A cultural heritage management plan (CHMP) including specific methodology and details for the protection of rock art will be developed - specific conditions outlined in the CHMP will be adhered to in undertaking the Proposed works.</p> <p>Formal consultation has been undertaken with the Traditional Owner through the Northern Land Council</p> <p>Minor</p>
Human health		
<p>There is low activity naturally occurring radioactive material onsite in the Proposal area.</p> <p>The Proposal area and the JFS storage area do not have public access.</p> <p>The transport of the low activity naturally occurring radioactive material from the Proposal area to the JFS will be on a public road.</p>	<ul style="list-style-type: none"> Exposure to radiation 	<p>The Proposal has potential to have a minor impact on Human Health. The low-grade radioactive materials will be handled, transported and stored in accordance with ARPANSA approvals.</p> <p>Minor</p>

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ACRONYMS

4WD	4 wheel-drive
AAPA	Aboriginal Areas Protection Authority
ABS	Australian Bureau of Statistics
ACM	Asbestos Containing Material
ARPANS Act	Australian Radiation Protection and Nuclear Safety Act 1998 (Commonwealth)
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
CEO	Chief Executive Officer
CPESC	Certified Professional Erosion and Sediment Control
Cth	Commonwealth
DAWE	Department of Agriculture, Water and Environment (Commonwealth) – now DCCEEW
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth) – formerly DAWE and DoE
DEPWS	Department of Environment, Parks and Water Security (Northern Territory) – now DLPE
DLPE	Department of Lands, Planning and Environment (Northern Territory) – formerly DEPWS
DNP	Director of National Parks
DoE	Department of the Environment (Commonwealth) – now DCCEEW
DPIR	Department of Primary Industry and Resources
EP Act	Environmental Protection Act 2019 (NT)
EPBC Act	Environment Protection and Biodiversity Conservation Act (1999) (Commonwealth)
ESCP	Erosion and Sediment Control Plan
GHG	Greenhouse gas
ha	Hectares
JFS	Jabiru Field Station
KNP	Kakadu National Park
MNES	Matters of National Environmental Significance
NLC	Northern Land Council
NR Maps	Natural Resource Maps
NT	Northern Territory
NT EPA	Northern Territory Environment Protection Authority
NVIS	National Vegetation Information System
OSS	Office of Supervising Scientist
PVC	Polyvinylchloride
SAQP	Sampling and Analysis Quality Plan
SML	Special Mining Lease
TEC	Threatened Ecological Community
TPWC Act	Territory Parks and Wildlife Conservation Act (1976) (Northern Territory)
WHS Act	Work Health and Safety (National Uniform Legislation) Act 2011 (Northern Territory)
WMPC Act	Waste Management and Pollution Control Act 1998 (Northern Territory)

PUBLICATION STATEMENT

This referral has been prepared by EcOz Environmental Consultants (EcOz) on behalf of the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEE), Office of the Supervising Scientist (OSS). A listing of the key consultants, their qualifications and experience in the environmental field are provided below.

Key consultant	Qualifications	Experience
Emma Lewis – Referral Lead & Reviewer Team Leader – Approvals	Bachelor of Science	14+ years
Eliza Grant – Referral Author Senior Environmental Consultant	Master of Environment (Climate Change); Bachelor of Commerce (Accounting)	5 years
Alice Nicholl – Referral Author Senior Environmental Consultant	Master of Science (BioScience); Bachelor of Science Zoology/Animal Biology	6 years
Emily Nagy – Referral Author Environmental Consultant	Bachelor of Environmental Science and Management (Sustainability)	4 years

Inputs from relevant technical consultants have been provided throughout the development of this referral. A list of the key technical consultants, their qualifications and experience in the environmental field is provided below.

Key technical specialist	Specialist area	Qualifications	Experience
Glen Ewers Team Leader – Ecology	Ecology & Significant Impact Assessments	Bachelor of Science; Bachelor of Laws; Diploma of Arts (Environmental Studies); Graduate Certificate in Ornithology	16+ years
Dr Che Doering Director Environmental Research Institute of the Supervising Scientist	Radiation protection	(Radioecology), Master of Science (Medical Physics), Bachelor of Science (Physics)	17 years
Keith Tayler Supervising Scientist	Uranium mining impact mitigation and monitoring	Master of Tropical Environmental Management, Bachelor of Science.	25 years
John Miller Director, Supervision and Audit Office of the Supervising Scientist	Regulation of uranium mining and exploration activities	Bachelor of Science (Hons Chemistry) Graduate Diploma in WHS	25 years
Brayden Miller Senior Environmental Officer Hydrogeology and Licensing Office of the Supervising Scientist	Radiation protection and monitoring	Graduate Diploma in Science (Groundwater Hydrology), Graduate Certificate in Environmental Assessment and Management, Bachelor of Science (Environmental Science),	7 years

1 INTRODUCTION

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), Office of the Supervising Scientist (OSS), are proposing to remediate the Koongarra site, a legacy uranium exploration site located in the Kakadu National Park (KNP). This referral report has been prepared to inform the Northern Territory Environment Protection Authority (NT EPA) of the Koongarra Remediation Project ('the Proposal'). The Proposal lies within the former Koongarra lease area and Koongarra project extension area in the KNP as shown on Figure 2-1.

The objective of the Proposal is to remediate the Proposal area by removing traces of historic uranium exploration activities and to allow for the natural integration of the site into the KNP, as requested by the Traditional Owner of the area. The proposed remediation works align with the vision of the KNP Management Plan 2016-26 (DNP 2016), which states a vision that "disturbed areas are rehabilitated and reintegrated into the park".

The Proposal involves clearing the area of legacy exploration infrastructure and to safely remove and relocate the Koongarra Source material, which consists of uranium core samples, core trays and crushed samples, from the Proposal area for storage at the OSS Jabiru Field Station (JFS).

The material referred to as the Koongarra Source, is currently licenced (Licence S0340) by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) under the *Australian Radiation Protection and Nuclear Safety Act 1998* (ARPANSA Act). Therefore, the disposal of the Koongarra Source will be undertaken in accordance with the relevant regulations and arrangements for handling, transport and storage of all radioactive material will require the approval of the ARPANSA Chief Executive Officer (CEO) at a time that is suitable.

The Proposal is being referred to the NT EPA in accordance with Section 48 of the NT *Environmental Protection Act 2019* (EP Act) to determine whether formal assessment under the EP Act is required.

The Proposal is also being referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – see Section 9.

This referral report has been prepared by EcOz Environmental Consultants (EcOz) on behalf of the proponent, OSS. The OSS will lead the remediation as the proponent on behalf of the Director of National Parks (DNP) as the Commonwealth entity responsible for KNP. The DNP currently manage the Proposal area and is responsible for the remediation of the area based on the outcomes of the Completion of Kakadu National Park (Koongarra Project Repeal) Bill 2013.

2 ENVIRONMENTAL CONTEXT

This section provides regional context for the Proposal location and land use history. Where relevant to the assessment of environmental factors, the existing environment and sensitive receptors are discussed in further detail in Section 7.

2.1 Location and regional context

The Proposal lies within the former Koongarra lease area and project extension area in the Alligator Rivers Region of the Northern Territory (NT), about 250 kilometres (km) east of Darwin, 30 km south of the Ranger Uranium Mine and 3 km east of Burrungkuy (Nourlangie) Rock.

The Proposal area lies in a valley bounded by the Mount Brockman outlier and the Arnhem Land plateau. The former Koongarra lease area is accessed via an existing track from the Kubara Pools carpark (as shown in Figure 2-1).

The JFS is a field office facility for the OSS and Parks Australia. It is located on the north-east perimeter of the Ranger Uranium Mine lease, to the south of the Jabiru Aerodrome, approximately 6.5 km north-east of Jabiru and 3 km north-west of Ranger Uranium Mine site.

There is an existing borrow pit identified (herein referred to as the laydown area), that will be used for temporary holding of material, that is located 100 metres (m) off Kubara Road, approximately 6 km from the Proposal area and 3.2 km north-west of the Kubara Pools carpark.

Table 2-1 provides a summary of the Proposal location regarding tenure and ownership.

Table 2-1. Summary of Proposal location

	Proposal area	Jabiru Field Station
Latitude	Provided at Appendix A.	12°39'40.18"S
Longitude		132°53'39.83"E
Area	550 ha	Footprint of the storage location is 0.03 ha (as a conservative estimate).
Street address	Kubara Road, Kakadu, NT 0822	Off the Arnhem Highway, Kakadu, NT 0822
Lot/Section number	NT Portion 1662	NT Portion 1662
Town/Hundred	N/A	N/A
Zoning	Not zoned	Not zoned
Tenure	Freehold	Freehold
Nearest residential community/town	Jabiru	Jabiru
Ownership of land	Kakadu Aboriginal Land Trust Aboriginal land (Scheduled under <i>Aboriginal Land Rights Act 1976</i>) as part of the Kakadu National Park	Kakadu Aboriginal Land Trust Aboriginal land (Scheduled under <i>Aboriginal Land Rights Act 1976</i>) as part of the Kakadu National Park

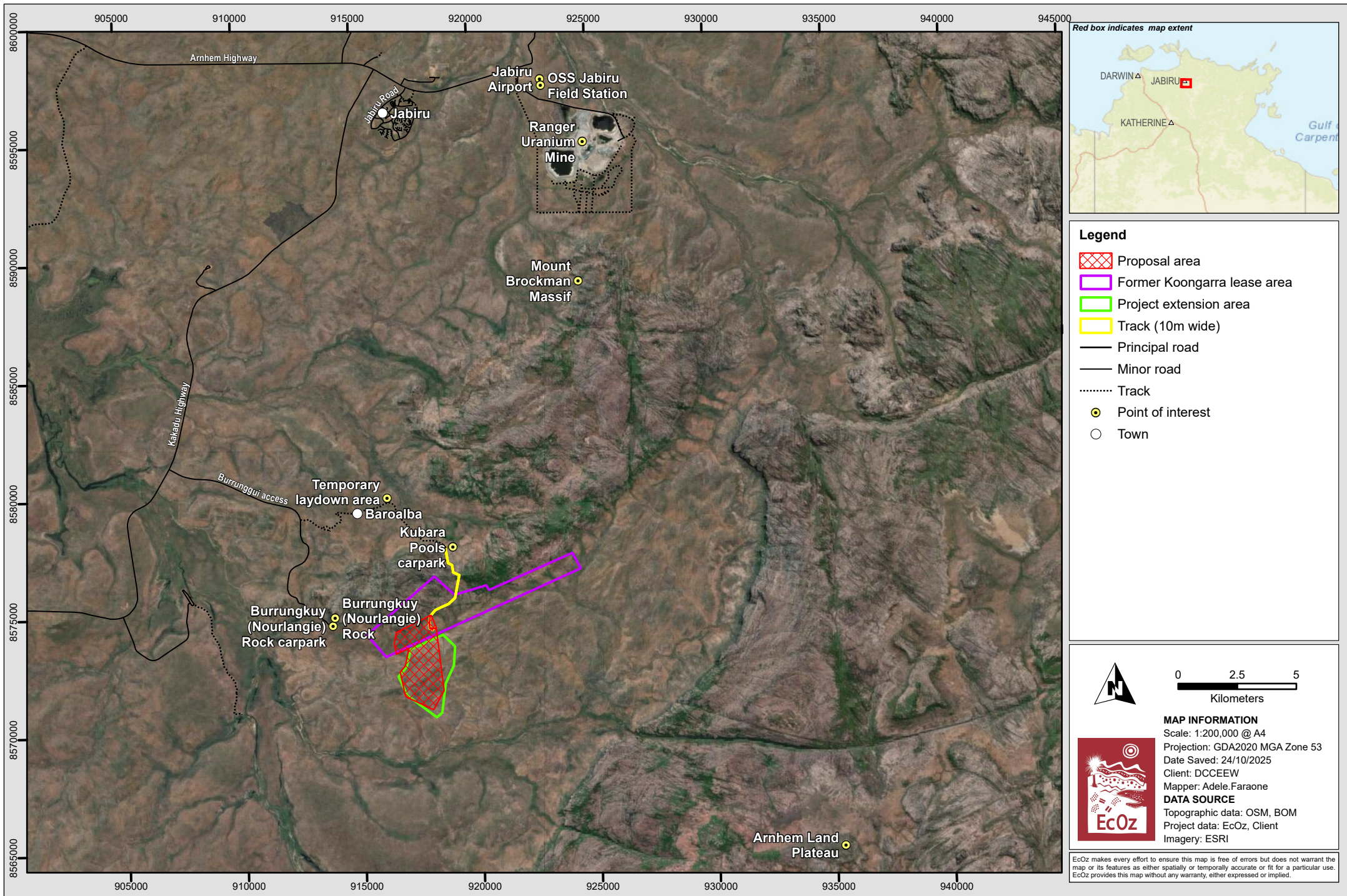


Figure 2-1. Proposal location

2.2 Land use history

The Koongarra lease area contains a high-grade uranium deposit. The deposit was discovered in the 1970s by Noranda, who applied for a NT Special Mining Lease (SML) and the area was excluded from the KNP when it was established. Ownership of the SML changed hands several times between 1980-1995, and while exploration and drilling continued throughout this time, the site was never mined due to opposition from the Traditional Owner (DAWE 2019).

In 1995, Areva acquired the Koongarra Project through its subsidiary Koongarra Pty Ltd, who resumed discussions with the Traditional Owner but was unable to acquire permission to mine the site. In 2013, the Completion of Kakadu National Park (Koongarra Project Repeal) Bill 2013 incorporated the Koongarra Project Area into KNP, removing the possibility of any future mining.

The exploration licences and lease applications held by the now-dissolved Koongarra Pty Ltd have ceased as of 23 January 2019, leaving the area under the management of the DNP. Legacy infrastructure from historical exploration remains throughout the Proposal area. The site is currently not in use, and no activity has occurred since 1995 (DCCEEW 2021).

3 PROPOSAL DESCRIPTION

The Proposal has three key components:

1. **Access track works** – refurbishment of the existing access track from Kubara Pools carpark to the Proposal area.
2. **Removal of the Koongarra Source** – repackaging the Koongarra Source into 205L sealed containers loaded into sea containers for transportation to the JFS for storage.
3. **Removal of legacy exploration infrastructure** – decommissioning of groundwater bores and exploration drill holes, removal of legacy exploration camp infrastructure such as old sheds, pickets and concrete slabs and transport to Darwin for disposal.

Proposal activities will occur within the 'Proposal area' (see Figure 3-1). As shown on Figure 3-1, the Proposal area includes a concentration of infrastructure in the north, and a number of dispersed occurrences of legacy waste throughout the southern part of the Proposal area. Because minimal works are required to remediate the waste items (as described further in Section 3.1.3), the disturbance activities required to facilitate the Proposal are limited to the northern part of the Proposal area - see Figure 3-2.

3.1 Key components

The key components of the project are detailed below.

3.1.1 Access track works

The access track is an existing 4.6 km track from the Kubara Pools car park that traverses over the Koongarra Saddle and will be used to access to the Proposal area. The access track is an unsealed formed road originally constructed to service the Koongarra exploration camp and was suitable for heavy vehicle traffic. The track is now only passable for 4-wheel drive (4WD) light vehicles as it has not been maintained for an extended period. There are washed out areas and vegetation is encroaching on the sides that will require refurbishment to allow safe access for rehabilitation works.

The refurbishment of the track is for the purpose of undertaking remediation works on the former mineral lease. Approximately 4800m³ of demolition waste needs to be removed from site, by truck. The objective is to do minimal work on the existing track, with minimal disturbance, while creating a track that is suitable for transit of a suitably identified truck to remove the waste material from the area.

The access track is proximate to registered sacred sites and corresponding restricted works areas that are protected under the *Northern Territory Sacred Sites Act 1989*. An Aboriginal Areas Protection Authority (AAPA) Certificate (C2024/51 – see Appendix B) has been issued for the Proposal by the AAPA. In accordance with the conditions of the AAPA certificate, the track is limited to being a maximum 6 m wide (being 3 m from the centreline).

The AAPA Authority Certificate (C2024/51) has been provided subject to conditions including identifying the protection measure for rock art and sacred sites of cultural significance. An archaeological survey will be completed from the Kubara carpark turnoff to the Koongarra Proposal area. A cultural heritage management plan and Rock Art Protection Plan, with specific methodology and details regarding protection measures, is being developed by a subject matter expert and will be implemented.

The access track crosses four ephemeral streams. As these works will be undertaken in the dry season, there is not expected to be significant water present. Track refurbishment works will include improving existing creek crossings, widening and rock armouring or other appropriate causeway remediation, addressing tight switch backs including minor grading, and widening where needed, temporary removal of bunds and other erosion controls, minimal clearing of overhead vegetation, clearing verges and track shoulders where required and sheeting to existing hardened surfaces. All these remediation works will occur with the existing approved extent of the access track (as per AAPA conditions).

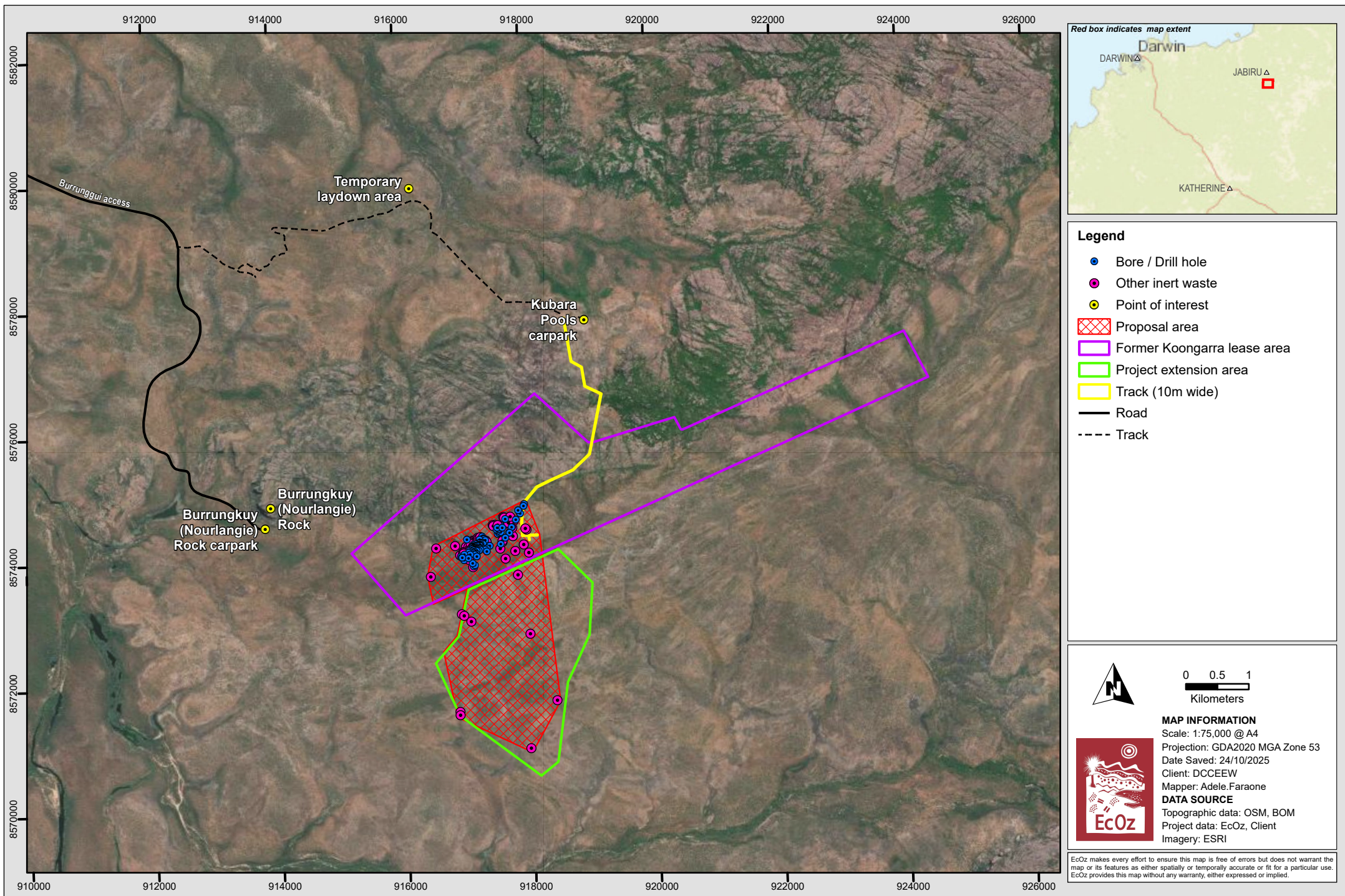
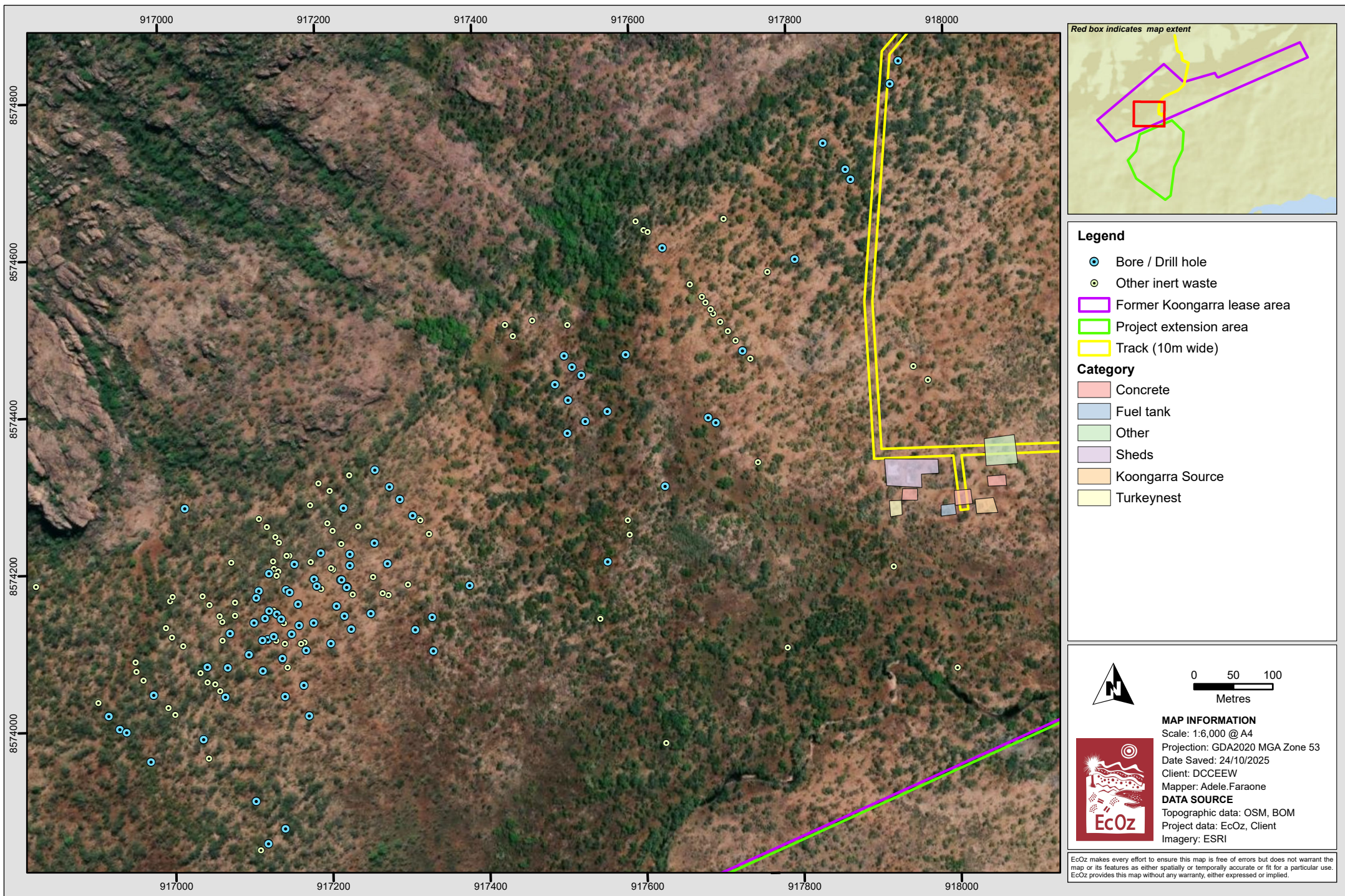


Figure 3-1. Map of Proposal area



Path: Z:\01 EcOz_Documents\05 EcOz M-Files GIS\2025\EZ25086 - Koongarra Remediation NT Referral\1. Project Files\2. Report Maps\EZ25086 - Koongarra Remediation\EZ25086 - Koongarra Remediation.aprx
 Layout: Figure 3-2. Map of bores, drill holes and camp infrastructure

Figure 3-2. Map of bores, drill holes and camp infrastructure

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At the completion of the remediation activities the refurbishment works to the access track will be retained as per the Traditional Owner's request to allow access to cultural sites. Temporarily removed bunds and other erosion controls will be reinstated including closing of grade, typically at the creek crossings, rock armouring and re-contouring of creek crossings will be retained ensuring no impediment to flows. The refurbishment of the track is to be such that it will require minimal ongoing maintenance. An appropriately qualified contractor will be engaged to undertake the track refurbishment work to ensure safe access for vehicles and equipment required to complete the Proposal. All works will be undertaken in line with AAPA certificate conditions.

3.1.2 Removal of the Koongarra Source

Repacking and removal

There are five 20-foot shipping containers containing the Koongarra Source (currently licenced by ARPANSA – licence S0340), being drill core and crushed samples collected during exploration of the Koongarra deposit. The samples contain varying concentrations of natural uranium (U-nat) (that is, U-238 in secular equilibrium with all progeny in its decay series). The measured U-nat activity concentration of sample material in the shipping containers is 1.25–3.29 Bq/g on average (Appendix C). Each shipping container is conservatively estimated to be 53,600 kilograms (kg) (ARPANSA 2023); hence the five shipping containers collectively are estimated to be 268,000 kg (approximately 268 tonnes (t)).

The shipping containers are sitting on the soil (that is, with no concrete beneath the containers). Due to the age and poor condition of the containers, the low activity naturally occurring radioactive material within will be repacked into sealed 205L steel drums for transport offsite and storage at the JFS.

Whilst it is not within the scope of this proposal, it is intended that the Koongarra Source will eventually be permanently disposed of in Pit 3 at the Ranger uranium mine.

The redundant shipping containers will be washed out at the Proposal area, a radiation survey completed, and a radiation clearance certificate provided. The cleaned containers will then be broken down for ease of transportation from the Proposal area and be held briefly in the temporary laydown area (on Kubara Road – described below) for final disposal to an appropriately licensed facility.

Following the removal of the Source material, a radiation clearance survey will be completed at the site to detect any residual radioactive contamination of soil, which if required, will be removed for disposal with the Source. These activities will be detailed in a Radiation Management Plan and Monitoring Plan, which will be included in a submission to the ARPANSA CEO prior to undertaking any works – required under section 63 of the *Australian Radiation Protection and Nuclear Safety Regulations 2018*.

Transport

After repacking the Koongarra Source into new steel drums at the Proposal area, the drums will be transported to a temporary laydown area on Kubara Road and loaded into sea containers. The sea containers will then be transported to an interim storage site (JFS) prior to final disposal in Pit 3 at the Ranger uranium mine, once the required regulatory approvals are in place. Transport of the Koongarra source material will follow the relevant requirements of ARPANSA's Radiation Protection Series C-2 Code for the Safe Transport of Radioactive Material (ARPANSA, 2019).

Because the access track traverses the Koongarra Saddle, which is a steep incline, there are limitations on the vehicles that can access the Proposal area and transport the material. Therefore, the Proposal includes the use of a temporary laydown area adjacent to the Kubara Road to which the drums will be transported by a 4WD and a trailer or small truck from the Proposal area.

The temporary laydown area is an existing gravel pit along the Kubara Road – see Figure 3-3. The track from the Kubara Road to the temporary laydown area is approximately 200 m long x 10 m wide and requires only minor vegetation pruning works to allow truck access.

A secure lockable compound will be established at the temporary laydown area, constructed from temporary fencing panels, with appropriate signage attached as per the requirements of the radiation management plan, to house the sea containers for storage of the repacked (205L drums) Koongarra Source material.

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The material (drums) will be immediately loaded and stored in secured and locked sea containers within in the temporary secure compound for several weeks (as short as possible) before being transported from the laydown area directly to the JFS for storage.

No disturbance outside of the existing footprint of the gravel pit at the temporary laydown area is required for the Proposal. The gravel pit is of sufficient size to allow the turnaround of larger trucks and to temporarily store material prior to re-loading and transport to its final destination. All material from Koongarra will be removed from the temporary laydown area before the wet season.

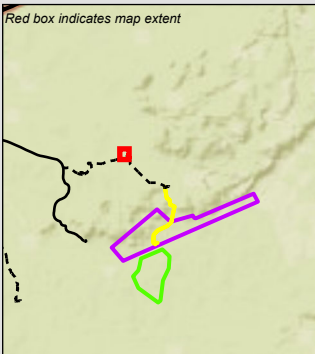
Temporary storage at JSF

The repacked sea containers housing the drummed Koongarra Source material will be stored at the JFS until final disposal is undertaken. The storage area at the JFS will be located at the southern boundary of the property – see Figure 3-4 - with a footprint size of approximately 0.03 ha (as a conservative estimate).

The JFS field office remains in daily use, though most of the use is confined to the office and laboratory buildings. The closest OSS facility to the proposed storage location is the OSS boat shed located approximately 20 m from the proposed storage area.

The soil at the storage area is highly compacted laterite, with loose gravel throughout. The proposed storage area is the site of the previously demolished OSS Physics Building and hence is already cleared and holds no vegetation or habitat value. Given the low radioactivity of the Source, its storage at the JSF will present no radiological risk to the environment, staff or members of the public.

The storage of the radioactive material at JFS will be licensed and regulated by ARPANSA to meet applicable codes and standards for radiation protection. Regulatory approval from ARPANSA is required before the material can be stored at JFS.



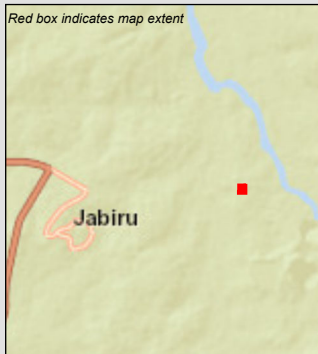
Legend

- Track
- ▭ Holding yard

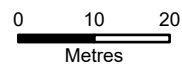
MAP INFORMATION
 Scale: 1:3,000 @ A4
 Projection: GDA2020 MGA Zone 53
 Date Saved: 24/10/2025
 Client: DCCEEW
 Mapper: Adele.Faraone

DATA SOURCE
 Topographic data: OSM, BOM
 Project data: EcOz, Client
 Imagery: ESRI

Figure 3-3. Map of Holding area



- Legend**
- Jabiru Field Station
 - Storage area



MAP INFORMATION
 Scale: 1:1,000 @ A4
 Projection: GDA2020 MGA Zone 53
 Date Saved: 24/10/2025
 Client: DCCEEW
 Mapper: Adele.Faraone
DATA SOURCE
 Topographic data: OSM, BOM
 Project data: EcOz, Client
 Imagery: ESRI

Figure 3-4. Map of Jabiru Field Station

3.1.3 Removal of legacy exploration infrastructure

Demolition of Koongarra camp infrastructure

The Koongarra camp is the location where exploration materials, storage and equipment were stored during exploration activities, as shown in Figure 3-1 and Figure 3-2. The camp area includes the following infrastructure:

- Three dilapidated sheds.
- An empty diesel fuel tank (minor dried residue in the base).
- Multiple concrete slabs.
- Remnants of the base of an old communications tower.
- Fencing and a gate.
- Mounds of dirt and various holes.

An inventory of infrastructure identified within the camp area in 2013 can be found in Appendix D.

An excavator (or similar machine) will be used to demolish the camp infrastructure and break up the concrete slabs prior to transport by small truck to the temporary laydown area where it will be stockpiled ahead of transport for final disposal at a licenced landfill facility. All works will occur within the camp area that has been subject to previous disturbance associated with the historic exploration activities.

The concrete slabs have been sampled for contaminants to confirm its suitability for disposal into landfill. Removal of the material will not be undertaken until laboratory results are received.

The OSS has completed a detailed radiation survey of the sheds and any material not suitable for disposal to landfill has been removed and will be disposed of with the Source. All remaining material in the sheds will be sent to landfill with the demolished infrastructure.

Asbestos was identified on the site near the old shed/office, weather station and within the gasket of the diesel fuel tank – see Appendix E. Most of this asbestos containing material (ACM) has already been removed with clearance provided by a licenced asbestos contractor – see the hygienist clearing certificate in Appendix F. A small amount of asbestos in the diesel fuel tank gasket was not accessible and will be removed during the demolition activities by a licenced contractor.

Within the Proposal area, there is a small turkey's nest dam and various depressions that require earthworks and infilling. The turkey nest is lined with a polyvinylchloride (PVC) liner and was historically used to store bore water for camp and exploration use. The leveling off and filling will be undertaken with existing materials on site, when laboratory results confirm its suitability. If on-site material is determined to be unsuitable for reuse, imported fill may be required from a certified fill provider to ensure fill is clean and free from off-site contamination. The PVC liner will be removed and disposed of with other legacy inert waste. If any material is brought into Kakadu it will comply with all requirements of the Kakadu National Park Management Plan 2016-2026 (DNP, 2016).

In addition to the camp infrastructure, there are items of legacy inert waste across the Proposal area (as shown Figure 3-1) which includes items such as star pickets, electrical wiring and some piping that will be removed. The isolated areas will be accessed by 4WD or ATV using the most direct route possible to minimise disturbance, or by foot where possible.

As with the Koongarra Source material, all waste materials removed from site will be transported by a small truck to the laydown area for temporary storage before reloading onto larger trucks for disposal to landfill or other suitable licensed facility. After the removal of the camp infrastructure, the Koongarra Source and inert waste, a weeds and radiation survey will be conducted across the camp area. If contamination is identified (such as, staining, odours, visible waste), the soil will be removed tested and disposed of off-site and imported soil will be used to fill in the holes. Validation sampling beneath potential contamination sites will be undertaken in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*.

Decommissioning of groundwater bores and exploration drill holes and casing

The Proposal includes approximately 97 historical water monitoring and extraction bores and exploration drill holes to be capped and decommissioned as part of the removal of the exploration infrastructure. The water bores and exploration drill holes are clustered in the northern area of the Proposal area as shown in Figure 3-1 and Figure 3-2. The bores and drill holes have either a steel casing or a concrete footing and inner PVC pipe. Bore and drill casing will be cut and removed to 0.5 m below existing surface level. The bore will then be plugged and buried. All removed bore and exploration drill casings and infrastructure will be transported offsite with the camp infrastructure for disposal.

The bores are spread through the Proposal area in low woodland and native grass areas. To access the exploration drill holes a 3-tonne (t) excavator will be walked in from the main access track and will articulate through the existing vegetation without clearing and disturbing the soil. An all-terrain vehicle will also access each bore. At each bore, it is estimated there will be a temporary disturbance area of 1.5 m radius around the bore casing associated with vehicle movement and equipment.

All exploration drill holes will be capped according to relevant guidelines and best industry practice.

Transport offsite to waste disposal facility

All camp infrastructure and inert waste from the above activities that is confirmed to be non-radioactive will be transported to a suitably licensed facility. Consistent with the removal of the Koongarra Source, all materials will be transported from the Proposal area to the laydown area (as shown in Figure 3-1) before being loaded onto larger trucks for the transport to a licensed facility.

In compliance with the *Waste Management and Pollution Control Act 1998* (WMPC Act), all transport and disposal listed wastes (such as ACM), will be undertaken by a licensed contractor and disposed of at an appropriately licensed facility.

Post-remediation regeneration

The objective of the Proposal is to rehabilitate the former Koongarra Exploration lease area (and project extension area) by removing historic exploration infrastructure and to allow for the natural revegetation and integration of the site into the Kakadu National Park (KNP), as requested by the Traditional Owner. The Proposal aligns with the vision of the Kakadu National Park Management Plan 2016-26, which states a vision that “disturbed areas are rehabilitated and reintegrated into the park”.

No areas will be subject to permanent clearing of vegetation, with the entire site being remediated and incorporated back into the surrounding natural environment in the long term. Vegetation will be flattened, not cleared, to facilitate movement of vehicles between legacy features.

The Traditional Owner would like to monitor the self-regeneration of the vegetation within the area over time, on completion of works. The Proposal area is currently in a degraded state as it contains legacy, dilapidated and radioactive exploration material and infrastructure. At completion of the remediation works, the savannah woodland ecosystem within the Proposal area is expected to improve in quality and value.

3.1.4 Summary of proposal components

A summary of the Proposal components and estimated temporary disturbance areas is provided in Table 3-1. A summary of the key Proposal inputs and outputs is provided in Table 3-2. All the temporary disturbance areas identified will be left to naturally revegetate over time.

Table 3-1. Key Proposal components

Project components	Summary of works	Estimated disturbance area (ha)
Access track	Connecting Kubara Pools carpark to the Proposal area. Conservative disturbance estimated as only vegetation pruning works or some minor alignment adjustments in sections.	1.00
Removal of the Koongarra Source	Containers of the Koongarra Source are currently in a fenced compound within the Proposal Area. Disturbance area included in camp infrastructure footprint below.	-
	The laydown area is an existing cleared gravel pit located along the access track. Minor vegetation pruning and lopping is required to reestablish the existing track.	0.20
	The JFS is located approximately 6.5 km north-east of Jabiru. No disturbance is required as this is already cleared land.	-
Removal of legacy exploration infrastructure	All of the bores and exploration drill holes are clustered in the northern part of the Proposal area as shown in Figure 3-2. To allow for 4WD access and a trailer to decommission the bores, a 1.5m metre disturbance radius is estimated for each bore. An additional 1ha allowance has been included in the estimated area to allow for access from the camp to the bores and drill holes. However as described in Section 3.1.3, the Proposal does not include land clearing of access tracks, rather pushing over of vegetation as a result of walking a 3t excavator through the area.	4.05
	Removal of legacy camp infrastructure and levelling of the site. The infrastructure components currently occupy an area of 0.5ha, however the whole camp area has been considered in the disturbance area.	1.30
	The remaining inert waste that is scattered across the Proposal area will be accessed by foot or ATV/ 4WD only using a direct route avoiding vegetation where possible to minimise disturbance.	Negligible
Total temporary disturbance footprint		6.55 ha

Table 3-2. Key Proposal features

Feature	Details
Workforce	<ul style="list-style-type: none"> • Each stage of the Proposal requires between 6-12 workers at any one time. • The workforce will be sourced from the NT (likely from Darwin or Katherine).
Schedule	<ul style="list-style-type: none"> • All works will be undertaken during the dry season and is estimated to be undertaken over a 2-year period. • The access track clearing and upgrade will be undertaken first before any other works can commence – estimated 20 days. • The removal of the radioactive source material is to be undertaken subsequently with limited activity undertaken concurrently – estimated 20 days. • The remediation activities including decommissioning of the exploration drill holes will then proceed – estimated 50 days with activities being undertaken concurrently.
Transport	<ul style="list-style-type: none"> • Daily travel to/from site during works. • The transport onsite within the Proposal area will be undertaken in UTVs, or standard 4WD vehicle with a trailer for waste. • The Koongarra Source and other demolition materials will be transported from the proposal area to the laydown area, via suitable small truck or 4WD vehicle with trailer. • From the laydown area, the Koongarra Source material will be transported by suitable truck from Koongarra to the JFS for storage. • All other material will be transported by truck from the laydown area to licensed waste facility.
Water and energy	<ul style="list-style-type: none"> • Fuel for mechanical equipment for the works will be stored in a suitably secure bunded area. • If a power source is required on site during works, a suitably bunded small generator will be supplied by the contractor. • Groundwater will be extracted from an existing groundwater bore in proximity to the Proposal area for use during works, including dust suppression. The bore will be selected in consultation with the Traditional Owner.
Waste	<ul style="list-style-type: none"> • Green waste from access track maintenance will be minimal as it will be limited to pruning and minor vegetation management and will remain on site to create habitat. • The radioactive source material is estimated to be 303 t of U-nat including the shipping containers • The non-radioactive material including all the camp infrastructure is estimated to be approximately 4000 t which consists predominantly of concrete and steel waste.
Hazardous substances	<ul style="list-style-type: none"> • The radioactive source material will be repacked into steel drums at the Proposal area, transported to the laydown area and which will then be packed into locked sea containers for transport and storage at the JFS. • Minimal volumes of hazardous chemicals will be stored on-site during works. Materials, such as diesel will be stored in small volumes only in an appropriately secure, bunded areas.

4 PROPOSAL ALTERNATIVES

There is no alternative to the Proposal other than a 'do-nothing' scenario in which the rehabilitation works are not undertaken, and the legacy exploration infrastructure will remain onsite in the former Koongarra project area. This would inhibit the ability of OSS to restore the environmental and World Heritage values that are currently diminished by the legacy exploration equipment. The Proposal is being undertaken in response to a direct request of the Traditional Owner and therefore a 'do nothing' scenario fails to act on Traditional Owner consultation to meet the objectives of the KNP Management Plan (DNP 2016).

In the design of the Proposal methodology, there were two possible access tracks that were being considered. The current access track from Kubara Pools carpark to the Proposal area was chosen because it is the most cost effective and environmentally suitable option. The other alternative would have required several long creek swamp/ crossing and significant vegetation clearance, extensive civil works and soil stabilisation to establish a new road to allow heavy vehicle access via this route. The alternative access track was an old unmaintained fire-break which traversed west from the Proposal area to the Burrunguy (Nourlangie) Rock carpark.

Based on consultation undertaken in July 2025, it was confirmed between OSS, the Traditional Owner, Parks Australia and KNP management that the Kubara Pools track was to be used. The existing track provides a robust and reliable surface for repeat vehicle use in comparison to the alternate fire break access. The gravelly subgrade and existing alignment of the Kubara access track will reduce the likelihood of structural failure under load, in addition the safety concerns associated with traffic management in respect to haulage movements are less on the Kubara track.

5 REGULATORY CONTEXT

The following sections discuss:

1. the policy context of the Proposal at both the NT and Commonwealth level required primary approvals
2. licences and authorisations
3. how the Proposal has applied the principles of environment protection and management (Part 2 of the EP Act), and general duty on proponents (section 43 of the EP Act).

5.1 Strategic and planning context

The rehabilitation of disturbed sites and reintegration into the KNP is a key priority under the KNP Management Plan 2016-2026 (DNP 2016). The cultural and environmental value of Kakadu, which includes Koongarra, is significant in Australia and recognised internationally for the natural and cultural heritage. This Proposal seeks to remove the legacy exploration infrastructure and to reintegrate the area into the surrounding KNP.

5.2 Legislation, policies and standards

The Proposal will adhere to all relevant NT and Commonwealth environment and heritage legislation and all associated permits and approvals will be required to be obtained. The NT EPA will assess the information in this referral to determine if the Proposal requires assessment under the EP Act. Relevant primary legislation is described in Table 5-1.

Table 5-1. Relevant primary legislation

Instrument	Relevance
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)</i>	Assists in the preservation and protection of Aboriginal and Torres Strait Islander heritage. The Proposal objective is for the restoration of the heritage of the KNP.
<i>Aboriginal Land Rights (Northern Territory) Act 1976 (Cth)</i>	The Proposal is in the KNP and is Aboriginal land under this Act. This Proposal was specifically requested by the Traditional Owner and formal consultation by the Northern Land Council has been completed.
<i>Australian Radiation Protection and Nuclear Safety Act 1998 (Cth)</i>	The Koongarra Source is licensed and regulated under this Act by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). Approval from ARPANSA is required before any of the works described in this referral involving the Koongarra Source can proceed.
<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>	A referral is being submitted under the EPBC Act for the Proposal. Should assessment and approval be required under the EPBC Act and the EP Act, this could be undertaken in accordance with a Bilateral Agreement made under section 45 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) between the Minister for the Environment (Commonwealth) and the Northern Territory.
<i>Environment Protection (Alligator Rivers Region) Act 1978 (Cth)</i>	The OSS has the duty to provide independent oversight of uranium mining activities, including environmental remediation in the Alligator Rivers Region. The OSS would still be required to provide independent oversight of the Koongarra Remediation in the event that it was undertaken by another agency.
<i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i>	If contamination is identified (such as, staining, odours, visible waste), the soil will be removed tested and disposed of off-site and imported soil will be used to fill in the holes. Validation sampling beneath potential contamination sites will be undertaken in accordance with the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i> .

Instrument	Relevance
<i>Environment Protection Act 2019 (NT)</i>	<p>Pre-referral screening determined the Proposal has potential to impact four environmental factors.</p> <p>This referral report will be reviewed by the NT EPA to determine whether formal assessment is required pursuant to the EP Act.</p>
<i>Heritage Act 2011 (NT)</i>	<p>This Act provides for the conservation of the NT's cultural and natural heritage. The Act protects all Aboriginal archaeological heritage places and objects, and other declared heritage places and objects.</p> <p>The Heritage Branch of the NT Government confirmed that archaeology assessment is not required due to the containment of activities, as further discussed in Section 7.4. If there are any changes to the planned project scope, OSS will need to re-engage with the Heritage Branch.</p>
<i>Northern Territory Aboriginal Sacred Sites Act 1978</i>	<p>There are a number of identified sacred sites within the Proposal area. An AAPA Certificate (C2024/051) has been issued for the remediation works – see Appendix B.</p> <p>An Authority Certificate is issued under section 22 when AAPA is satisfied that the work or use of the land could proceed or be made without there being a substantive risk of damage to, or interference with, a sacred site on or in the vicinity of the land; or an agreement has been reached between the custodians and the applicant.</p>
<i>Waste Management and Pollution Control (WMPC) Act 1998</i>	<p>Regulates the protection, restoration, and enhancement of quality of the NT environment through effective waste management and pollution control practices.</p> <p>The Proposal will comply with the general environmental duties outlined under section 12 of the WMPC Act.</p>
<i>Weeds Management Act 2001</i>	<p>This Act protects the Territory's economy, community, industry, and environment from the adverse impacts of weeds. To comply with the Act, OSS is required to manage its activities to ensure that declared weeds and potential weeds are not introduced or spread.</p>
<i>Work Health and Safety (National Uniform Legislation) Act 2011</i>	<p>The <i>Work Health and Safety (National Uniform Legislation) Act 2011</i> (WHS Act) and <i>Work Health and Safety (National Uniform Legislation) Regulations 2011</i> (WHS Regulations) regulates health and safety in the workplace. Will be applicable for all works associated with the project.</p>

5.3 Principles of environmental protection and management

The Proposal has applied the principles of environment protection and management (Part 2 of the EP Act), and section 43 general duty on proponents. Details of this are provided in Table 5-2.

Table 5-2. Checklist of the EP Act section 42 and 43 requirements

Section 43 General duty	Comment
The following principles of ecologically sustainable development must be taken into consideration in the design of the proposed action.	
<ul style="list-style-type: none"> Decision-making principle 	<p>Section 18 EP Act states:</p> <ul style="list-style-type: none"> Decision-making processes should effectively integrate both long-term and short-term environmental and equitable considerations. Decision-making processes should provide for community involvement in relation to decisions and actions that affect the community. <p>Yes. Both long-term and short-term environmental and equitable matters have been considered in this Referral. The Proposal design included active consultation with the Traditional Owner and representatives from Parks Australia and KNP management.</p>

Section 43 General duty	Comment
<ul style="list-style-type: none"> • Precautionary principle 	<p>Section 19 EP Act states:</p> <ul style="list-style-type: none"> • If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. • Decision-making should be guided by: <ul style="list-style-type: none"> • a careful evaluation to avoid serious or irreversible damage to the environment wherever practicable; and • an assessment of the risk-weighted consequences of various options <p>Yes. The precautionary principle has been applied throughout the Proposal to date and in this referral. Where there is uncertainty in potential impacts and mitigations required to manage these impacts, this has been discussed, with proposed actions to address this uncertainty either already underway or commitments made to address the uncertainty. OSS commits to the inclusion of adaptive management measures where relevant and to act in accordance with the precautionary principle in future.</p> <p>The Proposal will be designed to avoid and mitigate environmental impacts to the greatest extent practicable, to restore the environmental value of the site.</p>
<ul style="list-style-type: none"> • Principle of evidence-based decision-making 	<p>Section 20 EP Act states:</p> <ul style="list-style-type: none"> • Decisions should be based on the best available evidence in the circumstances that is relevant and reliable. <p>Yes. The Proposal is being informed by relevant and recent technical information such as Sampling Analysis and Quality Plan (SAQP) (Appendix G). Regular inspections are required to be undertaken in accordance with the ARPANSA licence and regular monitoring is undertaken to inform the remediation activities (e.g. Appendix C).</p>
<ul style="list-style-type: none"> • Principle of intergenerational and intergenerational equity 	<p>Section 21 EP Act states:</p> <ul style="list-style-type: none"> • The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of present and future generations. <p>Yes. OSS is committed to undertaking a robust remediation strategy to remove all legacy exploration infrastructure to restore the environment's health, diversity and productivity for the benefit of present and future generations.</p>
<ul style="list-style-type: none"> • Principle of sustainable use 	<p>Section 22 EP Act states:</p> <ul style="list-style-type: none"> • Natural resources should be used in a manner that is sustainable, prudent, rational, wise and appropriate. <p>Yes. The Proposal is to restore the natural resources. OSS do not propose to use natural resources in an unsustainable manner at any stage during the Proposal.</p>
<ul style="list-style-type: none"> • Principle of conservation of biological diversity and ecological integrity 	<p>Section 23 EP Act states:</p> <ul style="list-style-type: none"> • Biological diversity and ecological integrity should be conserved and maintained. <p>Yes. The objective of the Proposal is to strengthen the biological diversity and ecological integrity of the Proposal area.</p>
<ul style="list-style-type: none"> • Principle of improved valuation, pricing and incentive mechanisms 	<p>Section 26 EP Act states:</p> <ul style="list-style-type: none"> • Environmental factors should be included in the valuation of assets and services. • Persons who generate pollution and waste should bear the cost of containment, avoidance and abatement. • Users of goods and services should pay prices based on the full life cycle costs of providing the goods and services, including costs relating to the use of natural resources and the ultimate disposal of wastes. • Established environmental goals should be pursued in the most cost-effective way by establishing incentive structures, including market mechanisms, which enable persons best placed to maximise benefits or minimise costs to develop solutions and responses to environmental problems. <p>Yes. Environmental outcomes are considered by OSS when comparing options for the remediation.</p>

Section 43 General duty	Comment
	<p>OSS will be engaging contractors for the disposal of camp infrastructure. OSS will be responsible for the cost of the waste generated and its disposal.</p> <p>The low activity naturally occurring radioactive material will be stored at the JFS until an appropriate disposal location is confirmed. All costs will be borne by OSS.</p>
<p>The following management hierarchies have been taken into consideration in the design of the proposed action.</p>	
<ul style="list-style-type: none"> • Environmental decision-making hierarchy 	<p>Section 26 EP Act states:</p> <p><i>In making decisions in relation to actions that affect the environment, decision-makers, proponents and approval holders must apply the following hierarchy of approaches in order of priority:</i></p> <ul style="list-style-type: none"> • ensure that actions are designed to avoid adverse impacts on the environment. • identify management options to mitigate adverse impacts on the environment to the greatest extent practicable. • if appropriate, provide for environmental offsets in accordance with this Act for residual adverse impacts on the environment that cannot be avoided or mitigated. <p><i>In making decisions in relation to actions that affect the environment, decision-makers, proponents and approval holders must ensure that the potential for actions to enhance or restore environmental quality is identified and provided for to the extent practicable.</i></p> <p>Yes. OSS have undertaken previous soil and radiation surveys and Validation sampling beneath potential contamination sites should be undertaken in accordance with the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i>. Decision-making regarding the Proposal design considers avoidance of environmental values such as the avoidance of any land clearing and the selection of the most environmentally suitable access track.</p>
<ul style="list-style-type: none"> • Waste management hierarchy 	<p>Section 26 EP Act states:</p> <ul style="list-style-type: none"> • In designing, implementing and managing an action, all reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment. • For subsection (1), waste should be managed in accordance with the following hierarchy of approaches in order of priority: <ul style="list-style-type: none"> • avoidance of the production of waste; • minimisation of the production of waste; • re-use of waste; • recycling of waste; • recovery of energy and other resources from waste; • treatment of waste to reduce potentially adverse impacts; • disposal of waste in an environmentally sound manner. <p>Yes. The waste management hierarchy will be used for the waste in the Proposal where possible. The remediation activities will avoid the production of waste beyond what is required to remove the legacy exploration infrastructure and the Koongarra Source. All listed wastes will be disposed of in compliance with the WMPC Act.</p> <p>The Koongarra Source (radioactive waste) is regulated under the ARPANSA Act and regulations, with specific conditions required under the Licence (S0340). The Koongarra Source is being stored until an appropriate disposal location is confirmed.</p>
<p>Other section 43 considerations</p>	
<ul style="list-style-type: none"> • Have communities that may be affected by the proposed action been provided with information and opportunities for consultation? 	<p>The Proposal area and the JFS are not publicly accessible. The key stakeholders are the Traditional Owner, representatives from Parks Australia and KNP.</p>

OFFICIAL

Section 43 General duty	Comment
<ul style="list-style-type: none"> Has consultation with affected communities, including Aboriginal communities' been undertaken in a culturally appropriate manner? 	<p>Yes. OSS have engaged with APANSA, Kakadu National Park the NLC and directly with the Traditional Owner throughout the Proposal design process.</p>
<ul style="list-style-type: none"> Has community knowledge and understanding (including scientific and traditional knowledge and understanding) of the natural and cultural values of areas that may be impacted by the proposed action been sought and documented? 	<p>The Proposal acts in the interest of the Traditional Owner to restore the environmental, cultural and world heritage values that are currently diminished by the legacy exploration equipment. Remediation activities will also be undertaken in a manner to protect the rights and interests of the Traditional Owners by avoiding any further impact.</p> <p>An archaeological survey is being completed from the Kubara carpark turnoff to the Koongarra Proposal area, and a CHMP is being prepared. The plan will include specific methodology and details for the protection of rock art.</p>
<ul style="list-style-type: none"> Have Aboriginal values and the rights and interests of Aboriginal communities' been addressed in relation to areas that may be impacted by the proposed action? 	

6 CONSULTATION

The *EP Act 2019* requires proponents to engage with stakeholders who may be affected by their Proposal and to support these communities and the public to understand the potential impacts and benefits of a proposed action. The *NT EPA's Stakeholder Engagement and Consultation Guidance for Proponents (2021)* recognises that stakeholder consultation is an important component of social, cultural and health impact assessments, over and above formal opportunities for feedback on documents placed on public exhibition.

The Proposal is being undertaken in response to the request of the Traditional Owner to reintegrate the Proposal area into the surrounding KNP. Consultation has, and will continue to, be undertaken in accordance with section 43 *EP Act* general duty of proponents.

6.1 Stakeholders

The key stakeholders relevant to the Proposal are:

- Djok clan - Traditional Owner of the Proposal area
- Other Traditional Owner groups – neighbouring clans – Murrumburr and Mirarr
 - Other Aboriginal groups may be identified by the NLC through due process
- Northern Land Council (NLC)
- Parks Australia
- Commonwealth Government
- Northern Territory Government
- General public/users of the KNP.

6.2 Stakeholder engagement

The rehabilitation of the Proposal area was requested by the Traditional Owner at a Kakadu Board of Management Meeting. As such, OSS have been actively engaged with the Traditional Owner of the Koongarra site (Proposal area) directly and through the NLC as part of this Proposal to ensure the remediation objectives will be met in a manner that is consistent with stakeholder expectations.

6.3 Addressing stakeholder concerns

In determining the Proposal requirements, the NLC undertook consultation with the Traditional Owner on 21st August 2024 to inform OSS of the formal requirements for conducting works onsite.

NLC undertook a further round of consultation with the traditional owner on country on the 9th September 2025 to advise that the proposed use of the old fire break on the southern side on the outlier (Nourlangie rock) to the Burrungkuy carpark as the access route to the Proposal area was not viable from an environmental, economic, public safety and possible cultural perspective.

OSS has undertaken numerous site visits with key stakeholders including the Traditional Owner, Northern Land Council, representatives from Parks Australia, KNP and OSS. The visits were undertaken to discuss the matters associated with the sacred sites along the access track, and other proposed works on site. As outlined in Section 4, the Proposal considered alternative access routes to avoid the sacred sites between the Kubara Pools carpark and the Proposal area. Based on further site investigations and site visits and consultation with the Traditional Owner, there was a consensus reached that the Kubara Pools access route was the feasible route to use for the Proposal.

6.4 Future engagement

OSS will continue to actively engage with the Traditional Owner, Parks Australia and KNP management throughout the life of the Proposal.

OSS, Parks Australia and KNP currently meet monthly to discuss the project, provide status reports and identify any issues and address any concerns.

The Traditional Owner of the area is in regularly contact with OSS staff and will be engaged as a Cultural Advisor for the duration of works.

7 ENVIRONMENTAL IMPACT ASSESSMENT

The NT EPA has developed a framework for the assessment of environmental impact. The framework uses 14 environmental factors to provide a systematic approach to organising environmental information and to establish environmental objectives against which proposals will be assessed, categorised under five themes of Land, Water, Sea, Air and People (NT EPA 2025a).

Environmental factors are broad divisions of the environment that may be impacted by a proposal. Factors and factor objectives offer a system for organising environmental information for the purpose of environmental impact assessment and allow for the identification of values (the important components of a factor); the assessment of the significance of potential impacts to those values, and the setting of benchmarks to protect those values.

This section provides an assessment of the potential environmental impact of the Proposal in regard to the NT EPA's environmental factors and corresponding factor objectives, in accordance with *Referring a proposal to the NT EPA* (NT EPA 2025b). The assessment shows the Proposal is unlikely to result in significant impacts to any of the NT EPA's environmental factors.

7.1 Assessment overview

The pre-referral screening undertaken by EcOz Environmental Consultants determined the Proposal has potential to impact four of the 14 environmental factors. The justification for the factors considered for assessment are provided in Table 7-1. The factors that were excluded from further assessment are described in Table 7-2 with justification for their exclusion.

Table 7-1. NT EPA factors which are included for further assessment

Factor	Justification for further assessment
LAND	
Terrestrial environmental quality	The Proposal has the potential for contamination of soils as a result of the storage of low activity naturally occurring radioactive materials. Works required as part of rehabilitation activities that have the potential to result in erosion or sedimentation. See assessment undertaken in Section 7.2.
Terrestrial ecosystems	The Proposal includes vegetation disturbance that has the potential to impact habitat for threatened species. See assessment undertaken in Section 7.3.
PEOPLE	
Culture and heritage	The Proposal area includes four registered sacred sites. There are no known archaeological records within the Proposal area. The Proposal is for the restoration of cultural heritage and has the potential for positive impact. See assessment undertaken in Section 7.4.
Human health	The Proposal involves the removal of low activity naturally occurring radioactive materials which has the potential to result in human health impacts. See assessment undertaken in Section 7.5.

Table 7-2. NT EPA factors which were excluded from further assessment

Factor	Justification for exclusion
LAND	
Landforms	The Proposal will not significantly impact the nearby Mount Brockman Massif or Arnhem Land Plateau. This natural landform is approximately 300 m from the access track and 600 m away the Proposal area where the works will be undertaken.
WATER	
Hydrological processes	<p>The Proposal will not significantly impact the Water factor because:</p> <ul style="list-style-type: none"> • There is no large-scale land clearing that may alter the flows of ground or surface water. • Only minor amounts of groundwater will be extracted from an existing bore for dust suppression. • There are four streams that intersect the access track from Kubara Pools to the Proposal area. These are minor, ephemeral streams. As the maintenance works will be undertaken in the dry season, it is not expected that there will be water present during works. • There are two additional minor, ephemeral streams in the Proposal area. • The Koongarra camp infrastructure (excluding bores) is approximately 200 metres away from the nearest stream. • Works are to be undertaken in the dry season or otherwise will be appropriately managed with erosion and sediment controls. • The decommissioning of the bores will involve minor excavation works and will be undertaken in m such a way as to minimise impact. • The nearest waterway to the JFS is over 1 km away.
Inland water environmental quality	
Aquatic ecosystems	
SEA	
Coastal processes	The Proposal will not significantly impact the marine environment because there are no marine environments in or near the Proposal area.
Marine environmental quality	
Marine ecosystems	
AIR	
Air quality	<p>The Proposal will not significantly impact air quality or atmospheric processes.</p> <p>There will be minor contributions to dust, particulate matter and greenhouse gas (GHG) emissions associated with the operation of diesel-powered machinery and vehicles to undertake the Proposal; however, the Proposal will be undertaken over a short period of time and isolated to the Proposal area and the laydown area, where there are no sensitive receptors given the location. There are no permanent land clearing requirements (only minor, temporary disturbance) hence no GHG emissions from land clearing.</p>
Atmospheric processes	
PEOPLE	
Community and economy	<p>The Proposal will not interact with the general public because the Proposal area and JSF are not publicly accessible.</p> <p>There will also not be any substantial traffic implications given the small scale of work required.</p> <p>In the long term, the Proposal will positively impact the community and economy by way of restoring the environmental and cultural value of the site.</p>

7.1.1 Impact assessment methodology

For each of the four factors identified in Table 7-1, the following approach was taken to identify and assess environmental impacts from the Proposal:

- 1) **Identification and characterisation of environmental values:** A combination of desktop and field assessments were undertaken to identify and characterise the existing environment that occurs within the Proposal area and surrounds. Valued components of the environment were then selected for further assessment on the basis that they are ecologically, socially, culturally and/or economically important, and are either likely to be impacted by the Proposal, or people are highly concerned that they could be impacted.
- 2) **Identification of potential impacts:** Consideration was given to how the activities associated with implementing the Proposal (described in Section 3) could impact each of the valued components. Potential direct and indirect impacts were identified.
- 3) **Avoidance and mitigation:** The mitigation hierarchy was applied to each potential impact, identifying opportunities for impact avoidance. Where avoidance was not possible, mitigation measures were identified.
- 4) **Assessment of impacts:** The residual impact to each valued component was then assessed considering the context and intensity of the impact, and the scale, duration and magnitude (degree of change) of the impact. Definitions for residual impact ratings are provided in Table 7-3.

The focus of the impact assessment in this referral report is on those impacts identified to be potentially significant. Impacts identified that do not have potential to be significant are presented for each factor; however, are not presented in as much detail as those with potential to be significant (that is, they are ‘screened out’ as being potentially significant).

Table 7-3. Residual impact ratings

Minor	Moderate	High
<p>A minor residual impact is unlikely to be significant and generally has two or more of the following characteristics:</p> <p>Scale: limited/localised Magnitude: low Duration: short-term/ medium-term/reversible.</p> <p>OR</p> <p>There are no sensitive receptors or land uses present, and the environment does not contain any aspects that are valuable or otherwise important or unique, and there is moderate to high degree of certainty about the likelihood and intensity of the impact, and the effectiveness of proposed mitigation measures.</p>	<p>A moderate residual impact has potential to be significant. The significance depends on the acceptability of the impacts and the effectiveness of mitigation measures. A moderate impact generally has two or more of the following characteristics:</p> <p>Scale: localised Magnitude: moderate Duration: medium-term.</p> <p>AND/OR</p> <p>There are sensitive receptors or land uses present, or environmental aspects that are valuable or otherwise important or unique and there is a low degree of certainty about the impact, and the effectiveness of proposed mitigation measures.</p>	<p>A high residual impact is likely to be significant. The level of acceptability will depend on offsets or benefits compensating for the impact. A high impact generally has two or more of the following characteristics:</p> <p>Scale: regional/ widespread Magnitude: high Duration: long-term/permanent.</p> <p>AND</p> <p>There are sensitive receptors or land uses present, or environmental aspects that are valuable or otherwise important or unique.</p>

7.2 Terrestrial environmental quality

The NT EPA's objective for the terrestrial environmental quality factor is to:

Protect the quality and integrity of land and soils so that environmental values are supported and maintained.

7.2.1 Presence of environmental values

The environmental values identified for assessment under the Terrestrial Environmental Quality factor are:

- **Land and soil integrity** – intact land and soils are valued due to their role in supporting future land uses and preventing offsite impacts to water quality associated with erosion and sedimentation.
- **Land and soil quality** – clean (uncontaminated) land and soils are valued due to their role in supporting the future land use, and preventing offsite impacts to water quality associated with mobilisation of contaminants when soils are disturbed.

Land and soil integrity

The Proposal is adjacent to a small part of the southern margin of the Mount Brockman Massif, a large outlier of the Arnhem Land Plateau. The access track included as part of the Proposal area traverses on the saddle between Burrungkuy (Nourlangie) Rock and Mt Brockman Massif, which includes registered sacred sites. There are specific conditions in the AAPA Certificate (C2024/051) to limit the works that can be undertaken along this part of the track to protect the sacred sites.

Soils within the Proposal area are predominantly shallow, gravelly, earthy sands and sandy earths with substantial areas of deep gravel-free siliceous sands (White & McLeod 1986). Soils generally have massive structures and textures range from sands to sandy clay loams and have acid character. Profiles consistently have medium to rapid internal drainage, with slow site runoff (White & McLeod 1986). The sandy nature of the soils in the Proposal area makes them susceptible to erosion where vegetation cover has been removed, and run-off is concentrated or channelled into a specific location.

The Proposal area has varied topography as it includes the access track from the Kubara Pools over the saddle onto a much flatter area within the Proposal area – see Figure 7-1. There are some areas with slope greater than 2%, indicating an increased risk of erosion as per the NT Land Clearing Guidelines (DEPWS 2024). There is some existing erosion along the access track. This erosion was identified within the AAPA Certificate (C2024/051) and has specific licence conditions to address this.

Land and soil quality

The Koongarra Source stored on-site in shipping containers is low activity naturally occurring radioactive material stored as part of historical exploration activities. The shipping containers storing the material are located on the ground and in direct contact with the soil (i.e. there is no concrete beneath the containers). Annual inspections undertaken by the OSS identified that the containers housing the Koongarra Source have degraded over time however remain secure and stable (Miller 2022). Soil samples were collected in 2021 and 2022 from sites adjacent to the shipping containers to establish baseline activity concentrations for uranium-238 decay series radionuclides in soil. The results indicated that uranium-238 decay series radionuclides (including radium-226 and lead-210) are present in the soil at typical environmental levels, with no indication of contamination from the source material in the shipping containers. Following removal of the Koongarra Source, radiation surveys will be undertaken as per the existing Koongarra Radiological Baseline Survey – SAQP – see Appendix G - to confirm all radioactive material has been removed. Pre and post works radiation surveys will also be undertaken at the laydown area.

The Proposal area also includes other infrastructure including dilapidated sheds, concrete slabs and an empty diesel tank. Whilst there may be localised contamination present around this infrastructure, the scale and nature of it is such that it would not be considered widespread or high risk to future land use. The remediation activities will be limited to excavation and levelling out the soil and filling in holes using the soil on-site. If

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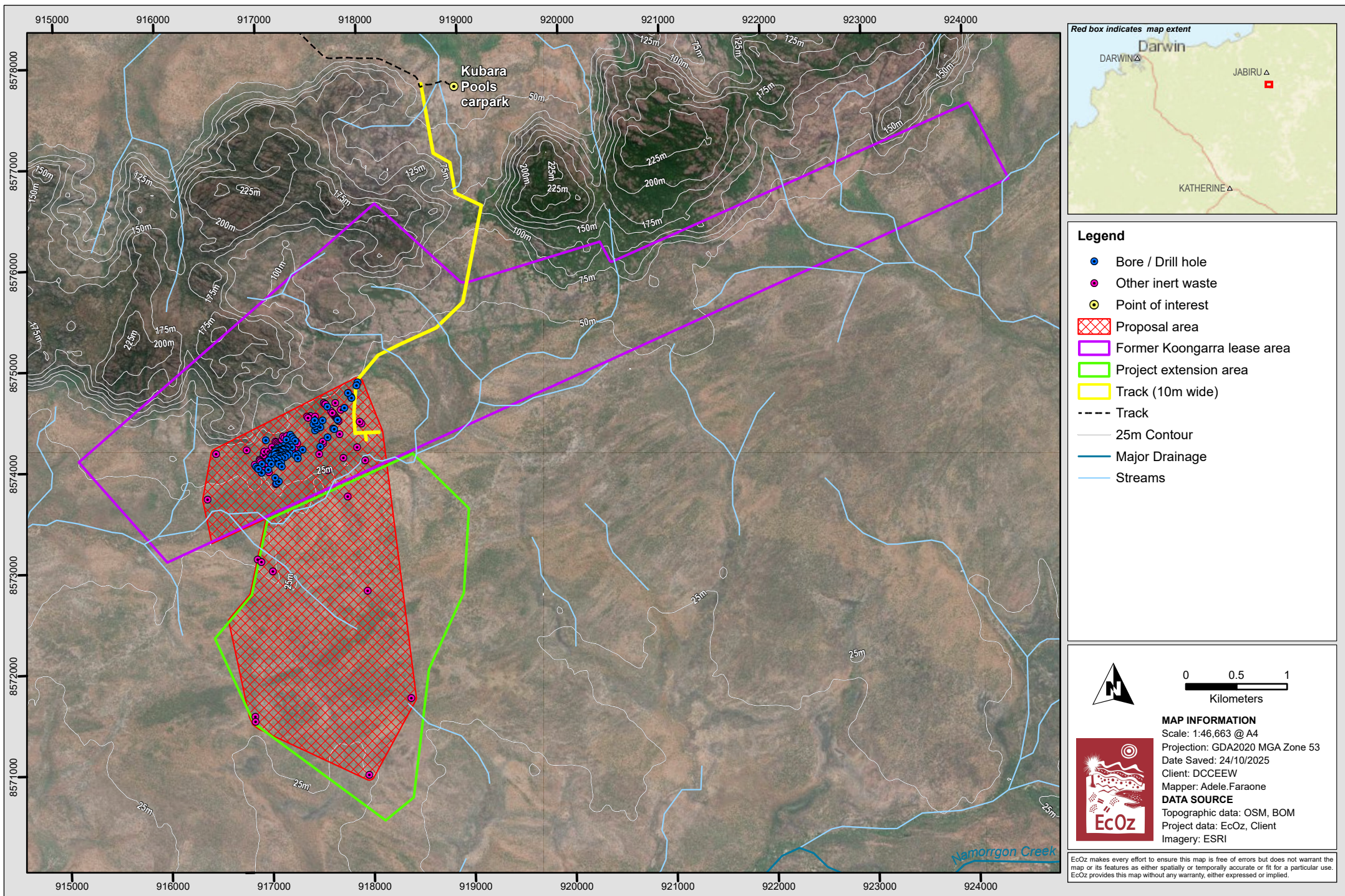
contamination is identified (such as, staining, odours, visible waste), the soil will be removed tested and disposed of off-site and imported soil will be used to fill in the holes. Validation sampling beneath potential contamination sites will be undertaken in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*.

As outlined in Section 3, bonded asbestos was identified on site and documented in a register. The majority of the asbestos has now been removed, and an asbestos clearance certificate was provided by a licensed asbestos assessor and is provided in Appendix F. There is a small amount of ACM remaining that can only be removed as part of the remediation works (that is, asbestos lined gaskets on the fuel tanks). This work will be done in line with NT WorkSafe requirements.

7.2.2 Impact assessment

Potential impacts that were identified but assessed as unlikely to be significant are presented in Table 7-4. While there is potential for contamination of soils to occur because of activities associated with the Proposal, this is unlikely to be significant because there are no existing sources of significant contamination within the Proposal area, and the Proposal does not involve activities which would result in significant contamination. There is a risk of spills of the radioactive Koongarra Source material during handling, transport and storage however the volumes would not pose a significant impact and handling, and storage procedures will be implemented, including incident response measures.

Erosion and soil loss was also identified as a potential impact due to land clearing and soil disturbance however accounting for implementation of avoidance and mitigation measures described in Table 7-4, the residual impact on Terrestrial Environmental Quality through erosion and soil loss is considered to be minor.



Path: Z:\01 EcOz_Documents\05 EcOz M-Files\GIS\2025\EZ25086 - Koongarra Remediation NT Referral\1. Project Files\2. Report Maps\EZ25086 - Koongarra Remediation\EZ25086 - Koongarra Remediation.aprx
 Layout: Figure 7-1. Map of Proposal area topography

Figure 7-1. Map of Proposal area topography

Table 7-4. Impact assessment - Terrestrial environmental quality

Potential impact	Proposal component	Environment protection and management		Residual impact significance rating
		Proposed avoidance	Proposed mitigation measures	
<p>Erosion and soil loss</p> <p>Slope within the Proposal area is generally <2% which does not present a high erosion risk however there are some minor excavation activities associated with the remediation of the site and accessing the bores for decommissioning. The disturbance of soils can lead to soil erosion by wind and rainfall.</p> <p>The access track over the saddle has an increased risk of erosion due to the steepness of the track and the sandy nature of the soils.</p>	<p>Access track works</p> <p>Removal of legacy exploration infrastructure</p>	<ul style="list-style-type: none"> • Ground disturbance works will only be undertaken in the dry season to avoid any runoff occurring during the wet season. • The route selection to the bores and inert waste will be based on the clearest track available to avoid damage to vegetation. • The excavator will lay flat the vegetation to avoid land clearing and associated exposed soils. 	<ul style="list-style-type: none"> • An Erosion and Sediment Control Plan (ESCP) will be developed by a suitably qualified person and implemented where works are scheduled in the wet season. • The ESCP will address the specific conditions of AAPA Certificate (C2024/051) in relation to works on the access track. • Dust suppression will be implemented as required. 	Minor
<p>Contamination of soils from spills/leaks during handling, transport and storage of radioactive material</p> <p>The Proposal requires the removal of the low activity naturally occurring radioactive material stored on-site. Minor volumes of fuel and chemicals may also be required for remediation activities. There is potential that a spill or leak of the hazardous or radioactive material could result in soil contamination within the Proposal area, at the laydown area or at the JFS.</p>	<p>Access track works</p> <p>Removal of the Koongarra Source</p>	<ul style="list-style-type: none"> • The Proposal does not include the use or production of any hazardous materials that cannot be managed through standard best practice measures. • Minor volumes of fuel and chemicals may be stored onsite during remediation activities, but standard controls will avoid these storages being a source of significant soil contamination. • Handling of the low activity radioactive material is regulated by ARPANSA and subject to specific licence conditions to ensure effective management. • The crushed core samples will be repackaged into appropriately sealed containers to provide for safe and secure transport and storage. 	<p>The following plans will be implemented to ensure the low activity naturally occurring radioactive material is secure:</p> <ul style="list-style-type: none"> • Radiation Management Plan. • Radiation Monitoring Plan. • Storage Management Plan. <p>These plans will include the following mitigations:</p> <ul style="list-style-type: none"> • Suitably qualified radiation safety officer to oversee activities to ensure effective control of radioactive material. • Appropriate personal protective equipment will be used when handling radioactive material, including respiratory protection. • Radiation dose meter will be used for hygiene inspections and checking radiation dose rates from samples. 	Minor

Potential impact	Proposal component	Environment protection and management		Residual impact significance rating
		Proposed avoidance	Proposed mitigation measures	
			<ul style="list-style-type: none"> • Personal dosimeters will be provided to staff handling radioactive material. • A spill kit (e.g. empty drum, shovel, gloves, dust mask) will be available for any spill incidents. • Pre and post radiation surveys. will be conducted by experienced staff from OSS with any contaminated soil removed and disposed of with the Source. • Transport of Koongarra source material will follow the relevant requirements of ARPANSA's Radiation Protection Series C-2 Code for the Safe Transport of Radioactive Material (ARPANSA, 2019). 	

7.2.3 Conclusion

The NT EPA's objective for the Terrestrial Environmental Quality factor is to: *Protect the quality and integrity of land and soils so that environmental values are supported and maintained.*

The Proposal has the potential to have a minor impact on Terrestrial Environmental Quality. The Proposal includes the removal, transport and handling of low activity naturally occurring radioactive material. The low activity naturally occurring radioactive material will be handled and transported in accordance with the licencing requirements by ARPANSA.

Potential impacts to soil integrity from erosion are expected to be minor and can be managed through standard practices such as an ESCP.

The environment protection and management measures outlined in this referral indicate that with appropriate management, the Proposal is unlikely to result in material significant impacts to Terrestrial Environmental Quality and will meet the NT EPA's objective.

7.3 Terrestrial ecosystems

The NT EPA's objective for the Terrestrial Ecosystems factor is to:

Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.

7.3.1 Presence of environmental values

The environmental values identified for assessment under the Terrestrial Ecosystems factor are:

- **Vegetation and habitats which provide a range of benefits** – including providing habitat for native wildlife, forming and protecting soils, providing for tourism and recreation, and other important functions relevant to ecosystem services that sustain human life.
- **Threatened species (flora and fauna)** which are vulnerable to extinction in the near future and are important due to the role they play in a healthy and functioning ecosystem, as well as having high social value. Species in the NT can be listed as threatened under the *NT Territory Parks and Wildlife Act 1976* (TPWC Act) or the Commonwealth EPBC Act and are afforded legislative protection under these Acts.

Vegetation and habitats

The Proposal area is a disturbed site populated mainly by grasses with sparse tree cover. Barnyard Grass (*Echinochloa colona*) and Mission Grass (*Cenchrus pedicellatus*) have been previously recorded in the area (DLPE 2003). The habitat surrounding the Proposal area is intact, Eucalypt-dominated savanna woodland – the most widespread habitat in the Top End.

The access track (as shown in Figure 3-1) passes over the Koongarra Saddle within the West Arnhem Land Plateau. This area is surrounded by intact Corymbia low woodland with a hummock grassland ground cover on a rugged sandstone plateau.

Threatened species

A desktop likelihood of occurrence (LOO) assessment - Appendix H - was undertaken to inform the likelihood of threatened flora and fauna and migratory species occurring within and relying on habitat within the Proposal area.

Due to the small size and highly restricted area of disturbance, the Proposal area is not considered to contain critical habitat that supports any threatened flora or fauna species. There are no savanna woodland threatened species with restricted ranges that have a high vulnerability to disturbance that are relevant to this region.

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One species was assessed in the LOO to have a high likelihood of occurrence within the Proposal area – the Partridge Pigeon (*Geophaps smithii smithii*). However, this species is a habitat-generalist and is expected to use the extensive savannah woodland habitat in the surrounding area as it would use the Proposal area. This species also has a relatively large home range and would likely use the surrounding habitat frequently.

The following species were assessed to have a medium likelihood of occurrence within the Proposal area:

- Northern Brushtail Possum (*Trichosurus vulpecula arnhemensis*)
- Arnhem Rock-rat (*Zygomys maini*)
- Northern Quoll (*Dasyurus hallucatus*)
- White-throated Grasswren (*Amytornis woodwardi*)
- Oenpelli Python (*Simalia oenpelliensis*)
- Ghost Bat (*Macroderma gigas*).

The Northern Brushtail Possum, Northern Quoll and White-throated Grasswren, like the Partridge Pigeon, would not rely on any critical habitat within the Proposal area and are expected to use the extensive savannah woodland habitat in the surrounding area.

Unlike the Partridge Pigeon, the Arnhem Rock-rat, Oenpelli Python and Ghost Bat require specific habitats within the West Arnhem Plateau – specifically the Mt Brockman massif proximate to the Proposal area. Access is via an existing access track that traverses the Koongarra Saddle and does present a potential impact for escarpment species.

The LOO also identified the possibility of migratory species protected under international agreements occurring within the region. Again, due to its small size and high level of disturbance, the proposal area is highly unlikely to provide habitat that supports any migratory species. Moreover, most of these migratory species have a low likelihood of occurring in the habitat surrounding the Proposal area. Many of the birds listed within the report are wetland species and/or occur almost exclusively in coastal and estuarine environments. For these species – and marine species – the habitat surrounding the proposal area does not contain suitable habitat. The remaining migratory species can occur within savanna woodland. However, even if individual members of some migratory species were to seasonally utilise the habitat surrounding the proposal area, this occurrence is expected to be for a short period and in low abundances. Additionally, any migratory species utilising the habitat surrounding the proposal area could reasonably be expected to utilise the areas of similar habitat in the region. As such, the habitat surrounding the proposal area is not considered to be important habitat for any migratory species.

Finally, the EPBC Protected Matters Search Tool report (generated as part of the LOO) notes that the Arnhem Plateau Sandstone Shrubland Complex – a Threatened Ecological Community (TEC) – is known to occur in the region. That TEC is found on sandstone plateaux; the proposal area is at the base of a massif. Therefore, the Arnhem Plateau Sandstone Shrubland Complex is not relevant to this proposal.

Based on the above reasons, impacts to threatened species are not considered further.

7.3.2 Impact assessment

Potential impacts that were identified are presented in Table 7-5. While there is potential for degradation of vegetation, habitat and significant vegetation in areas directly surrounding the Proposal area by way of noise and dust emissions, this is unlikely to be significant because of the works are the activities are only required in the short-term and can be managed through standard environmental measures as outlined in Table 7-5. Based on the scope and duration of the proposed activities, and the avoidance and mitigation measures described in Table 7-5, the residual impact on Terrestrial Ecosystems is considered to be minor.

Table 7-5. Impact assessment - Terrestrial ecosystems

Potential impact	Proposal phase	Environment protection and management		Residual impact significance rating
		Proposed avoidance	Proposed mitigations measures	
<p>Loss or degradation of habitat Some minor areas of vegetation surrounding existing camp infrastructure will be temporarily disturbed to facilitate movement of vehicles on site. Ultimately, the Proposal area will be naturally revegetated to incorporate into the natural surrounds in the long term in accordance with the objective of this Proposal.</p>	<p>Access track works</p> <p>Removal of legacy exploration infrastructure</p>	<ul style="list-style-type: none"> • Limit pruning for access track upgrades within 3 metres of the current track centreline. • Avoid introducing new weeds into Proposal footprint by implementing weed hygiene in accordance with a Weed Management Plan. • Flattening of vegetation for access to bores instead of land clearing. 	<ul style="list-style-type: none"> • Implementation of Weed Management Plan that has been developed in accordance with the requirements of the <i>Weeds Management Act 2001</i>. • Implementation of dust controls in accordance with AAPA Certificate 2024/051. • Where possible site access to and within the Proposal area is limited to existing cleared areas, or areas of sparse vegetation. 	<p>Minor</p>

7.3.3 Conclusion

The NT EPA's objective for the Terrestrial Ecosystems factor is to: *Protect the quality and integrity of land and soils so that environmental values are supported and maintained.*

The Proposal has potential to have a minor residual impact on Terrestrial Ecosystems. No areas will be subject to permanent clearing of vegetation, with the entire site being remediated and incorporated back into the surrounding natural environment in the long term. Vegetation will be flattened not cleared completely to facilitate movement of vehicles between legacy features.

The Proposal area does not include any areas of important habitat for any threatened species or migratory species, and any species within the Proposal area could be reasonably expected to utilise the surrounding habitat while works are being undertaken.

The environment protection and management measures outlined in this Referral indicate with appropriate management, the Proposal is unlikely to result in material significant impacts to Terrestrial Ecosystems and will meet the NT EPA's objective.

7.4 Culture and heritage

The NT EPA's objective for the Culture and Heritage factor is to:

Protect sacred sites, culture and heritage.

7.4.1 Presence of environmental values

The environmental values identified for assessment under the Culture and Heritage factor are:

- **Sacred sites** – Sacred sites have been identified by Traditional Owners and site custodians within the proposal area. Sacred sites are protected under the *Northern Territory Aboriginal Sacred Sites Act 1989* due to their cultural significance.
- **Aboriginal archaeological features** – recorded Aboriginal archaeological features such as shell middens and scattered artefacts, that have heritage significance and cultural significance to the traditional custodians of the land.
- **Cultural landscape features and connection** – features which have been identified by the Traditional Owners and Aboriginal people as area which hold cultural significance but are not sacred sites or archaeological places or objects recognised and protected under legislation. Cultural landscape features may be significant for resource use and ongoing practice of culture.

Sacred sites

The Proposal has an Aboriginal Areas Protection Authority (AAPA) certificate of approval (C2024/051) with conditions – see Appendix B. The AAPA Authority Certificate C2024/051 identifies several sacred sites and surrounding restricted work areas to limit the activity and access to, and around the sites. There are specific conditions in certificate C2024/051 that are included to protect sacred sites that will be adhered to in undertaking the remediation works. To ensure the protection of sites identified an archaeological survey is being completed from the Kubara carpark turnoff to the Koongarra Proposal area. A CHMP and Rock Art Protection Plan, with specific methodology and details regarding protection measures will be developed by a subject matter expert. The CHMP and Rock Art Protection Plan and will be implemented as part of the works.

Aboriginal archaeological features

The NT Heritage Branch confirmed that the proposed remediation works do not require a further archaeological survey due to the containment within the Koongarra project area. The site is previously disturbed, through the exploration activities, and the Proposal activities present an inherently low risk of potential impact to Aboriginal

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archaeological features. Regardless, as noted above, an archaeological survey is being undertaken and a CHMP and Rock Art Protection Plan are being developed by a subject matter expert. OSS will be integrating the 'unexpected finds protocol' previously provided to the Heritage Branch within the remediation work plan, as recommended by the Heritage Branch.

Because of the above reasons, impacts to Aboriginal archaeological features is not assessed further.

Cultural landscape features and connection

This Proposal, with the objective to remediate the Koongarra site, was specifically requested by the Traditional Owner. The KNP is on Bininj/Mungguy land and is inscribed on the World Heritage List under the World Heritage Convention for its outstanding natural and cultural values. The legacy exploration infrastructure currently in the Proposal area is not used and its existence within the KNP is not in congruence with the natural landscape. The Bininj/Mungguy word for 'country' not only refers to the landscape but also captures the rich interconnections between land and people – these are inseparable terms in Bininj /Mungguy, unlike in western concepts (DNP 2016). Therefore, the landscape holds significant cultural value due to the connection between country and people. The Proposal will remove the obstruction of the natural landscape with the removal of the legacy exploration infrastructure, providing the opportunity to reconnect with the country. As detailed in Section 6, the Proposal is informed by consultation with the Traditional Owner and the NLC.

Because of the above reasons, impacts to cultural landscape features and connection is not assessed further.

7.4.2 Impact assessment

Potential impacts that were identified but assessed as unlikely to be significant are presented in Table 7-6. There is potential for degradation of sacred sites during the works required for the Proposal, however specific conditions of the AAPA Certificate, including dust and erosion controls, will be implemented on the proposed works to mitigate potential damage to sacred sites. In addition, a subject matter expert in preparing a Cultural Heritage Management Plan for the site that will include a specific Rock Art Protection Management Plan. Overall, based on the implementation of the specific avoidance and mitigation measures for sacred sites, the residual impact on Culture and Heritage is considered to be minor.

Table 7-6. Impact assessment - Culture and heritage

Potential impact	Proposal phase	Environment protection and management		Residual impact significance rating
		Proposed avoidance	Proposed mitigation measures	
<p>Degradation of sacred sites The Proposal has the potential to degrade the sacred sites identified within the AAPA certificate.</p>	<p>Access track works</p> <p>Removal of the Koongarra Source</p> <p>Removal of legacy exploration infrastructure</p>	<ul style="list-style-type: none"> • Relevant approvals have been obtained through the provision of an AAPA certificate (C2024/051) to provide specific conditions for works to be undertaken, including designated restricted works areas. • A laydown area is being used to avoid any major works to the access track required to facilitate larger trucks to access the Proposal area. Rather an alternative methodology was adopted. 	<ul style="list-style-type: none"> • The Proposal will adhere to all the AAPA certificate conditions to protect sacred sites - details are provided in Appendix B. • Implementation of Cultural Heritage Management Plan and Rock Art Protection Management Plan. 	<p>Minor</p>

7.4.3 Conclusion

The NT EPA's objective for the Culture and Heritage factor is to: *Protect sacred sites, culture and heritage.*

There is significant cultural and heritage value of the Proposal area with natural landscapes and connection to the Bininj/Mungguy people. There are sacred sites identified on-site, however any impacts will be appropriately avoided and mitigated in accordance with the AAPA certificate.

The Proposal seeks to provide a positive benefit to cultural value by restoring the land to its natural state; this is the objective of the Proposal and meets the NT EPA's objective.

7.5 Human health

The NT EPA's objective for the Human Health factor is to:

Protect the health of the Northern Territory population.

7.5.1 Presence of environmental values

The environmental values identified for assessment under the Human Health factor are:

- **Health and wellbeing** – physical and mental health, especially for those who are highly vulnerable to social exclusion or substantial change, plus wellbeing of individuals and communities.
- **Public safety** – the protection of the community against danger, risk or injury.

Health, wellbeing and safety

As outlined in Section 3, the Proposal includes handling low activity naturally occurring radioactive material, the Koongarra Source, to be removed from the Proposal area. The Koongarra Source is currently licenced under ARPANSA (Licence S0340) and is subject to specific safety controls to protect public health and safety. These controls apply during the handling, storage and transport of the materials and apply to each stage of the Proposal.

There is ACM identified onsite, however as confirmed by the inspection report, the material presents a low risk of exposure to airborne fibres due to the stability and location of the material, as well as the infrequent and low duration of exposure to the products (see Appendix E). Based on these findings, impacts from the exposure to ACM is not assessed further.

The nearest public area to the Proposal area is the Burrungkuy (Nourlangie) carpark located 2 km west of the Proposal area. The JFS is located on the Ranger Mine lease, approximately 500 meters from the Jabiru Airport as the nearest public area. There is no public access to the JFS site or the Proposal area.

The health and safety assessed under this section includes the general public and Traditional Owner. The health and safety of workers is regulated by the ARPANSA *and* not required to be assessed for the purposes of the EP Act.

7.5.2 Impact assessment

Potential impacts that were identified but assessed as unlikely to be significant are presented in Table 7-7. While there is potential for human health impacts from exposure to low activity naturally occurring radioactive materials during transport from the Proposal area to the JFS, this is unlikely to be significant because the materials will be securely contained within appropriately sealed containers to ensure safe transport and storage. The risk of public exposure during transport is further reduced by adherence to the safety precautions to repackage the material for safe transport following the relevant requirements of ARPANSA's Radiation Protection Series C-2 Code for the Safe Transport of Radioactive Material (ARPANSA, 2019).

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There is also a limited potential for exposure to radiation while the low-grade radioactive material is stored at the Proposal area or at the JFS due to the distance from public areas and the restricted access to the public.

Based on the controls and management measures to ensure safe transport and storage of the low activity naturally occurring radioactive material, the residual impact on Human Health from exposure to low activity naturally occurring radioactive materials is considered to be minor.

Table 7-7. Impact assessment - Human health

Potential impact	Proposal phase	Environment protection and management		Residual impact significance rating
		Proposed avoidance	Proposed mitigation measures	
<p>Exposure to radiation Prolonged exposure to low activity naturally occurring radioactive materials, such as the Koongarra Source, can pose a to human health and safety due to the effects of radiation such as cancer. There is potential for exposure to radiation due to disturbance and movement of low activity naturally occurring radioactive material.</p>	Removal of the Koongarra Source	<ul style="list-style-type: none"> • There is no public access to the Proposal area. • There will be no public access to the JFS storage facility. • The storage facility will have security measures for safe storage in accordance with the <i>AS/NZS 2243.4:2018 Safety in laboratories Part 4: Ionizing radiations</i>. These include appropriate signage and locks to ensure that access is restricted. • There will be fence constructed around the container at the storage facility. • The low activity naturally occurring radioactive material will be securely stored in new shipping containers for transport. 	<p>Radioactive materials will be handled, transported and stored in accordance with ARPANSA Act and regulations:</p> <ul style="list-style-type: none"> • RPS C-1 Code for Radiation Protection in Planned Exposure Situations (Rev.1) (2020) • RPS C-2 Code for the Safe Transport of Radioactive Material (2019). • AS/NZS 2243.4 Safety in laboratories, Part 4: Ionizing radiations. • The RMP, SMP and Monitoring Program will include specific controls to ensure the security and safety of the radioactive material during storage. 	Minor

7.5.3 Conclusion

The NT EPA's objective for the Human Health factor is to: *Protect the health of the Northern Territory population.*

The Proposal has the potential to impact on human health. The Proposal includes site rehabilitation, transport and storage low activity naturally occurring radioactive materials. However, there is no public access to the Proposal area such that there is no potential for public exposure to radiation during repacking of radioactive materials at the site. The radioactive material will be sealed in steel drums packed into shipping containers for transport such that there is no potential for radiation exposure to the public during transport. There is no public access to JFS where the radioactive material will be stored within a fenced and locked compound. Regulatory approval and oversight from ARPANSA provide further confidence that the public are protected from any radiation health impacts. As a result, the Proposal is unlikely to result in material significant impacts to Human Health and will meet the NT EPA's objective.

8 CUMULATIVE IMPACTS

The EP Regulations (regulation 79) defines matters that may be included in an environmental impact assessment, including a cumulative impact assessment that takes into account the combined impact of the action or proposal and other actions.

Table 8-1 identifies key Proposals in the Kakadu region, where the Proposal is located that:

- are approved, planned or reasonably likely to occur in the next five years
- are likely to affect the same environmental values as the current Proposal within the Kakadu region to an extent these impacts could be considered cumulative.

It should be noted these projects have been identified based on a review of online sources and publications, including projects being referred to or being assessed under the NT EP Act and/or EPBC Act, are identified in an existing regional land use plan, or are identified as major projects on the NT major projects list. It is not exhaustive but is considered representative of the key projects that may be interrelated or contribute to cumulative impacts. Climate change is also typically considered a potential to exacerbate residual impacts and contribute to cumulative impacts. However, due to the short-term nature of the remediation works required, the Proposal is not considered to contribute to cumulative climate change impacts.

Table 8-1. Interrelated projects in the Kakadu Region

Project	Timeframe	Description
Ranger Uranium Mine Closure	30 years	<p>The Ranger Mine Closure Plan includes the requirement to rehabilitate the site back using local native plant species similar in density and abundance to those existing in adjacent areas of KNP (ERA 2024).</p> <p>With successful remediation, the closure of Ranger has the potential to strengthen the positive impacts identified under Culture and Heritage and mitigates potential future impacts relevant to Terrestrial Ecosystems for the Kakadu region. These projects are interrelated as opposed to cumulative.</p>
Kubara Road Upgrade	3-4 months	<p>The Department of Logistics and Infrastructure have a construction tender currently under assessment for the realignment of Kubara Road from Ch 0.3 km to 2.5 km. The works will involve land clearing and civil works to construct the new section of road.</p> <p>These works are currently scheduled to be completed by December 2025 and will not overlap with this Proposal.</p>
Jabiru remediation works, Jabiru Masterplan and town redevelopment	Unknown	<p>A Jabiru Masterplan 2018-2028 was developed by the Gundjeihmi Aboriginal Corporation on behalf of the Mirarr Traditional Owners, which includes several projects including remediation works (contaminated sites such as the petrol station and fire station, replacement of ACM in services infrastructure) and town redevelopment (new-build) projects.</p> <p>The current timing of proposed works is not well understood; however, it is unlikely there will be extensive works underway at the same time as this Proposal that would contribute to cumulative impacts.</p>

9 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

As discussed in Section 1, the Proposal is being referred to the Commonwealth DCCEEW under the EPBC Act. A summary of MNES and their relevance to the Proposal is provided in Table 9-1. DCCEEW will determine whether the Proposal requires assessment and approval under the EPBC Act upon receipt and review of the referral.

Table 9-1. MNES summary

MNES	EPBC Act Section	Relevant to proposal
World Heritage	S12	Yes
National Heritage	S15B	No
Ramsar Wetland	S16	Yes
Threatened Species and Ecological Communities	S18	Yes
Migratory Species	S20	Yes
Nuclear	S21	Yes
Commonwealth Marine Area	S23	No
Great Barrier Reef	S24B	No
Water resource in relation to large coal mining development or coal seam gas	S24D	No
Commonwealth Land	S26	Yes
Commonwealth heritage places overseas	S27B	No
Commonwealth or Commonwealth Agency	S29	Yes

10 CONCLUSION

The Commonwealth DCCEEW, OSS, are proposing to rehabilitate the former Koongarra legacy exploration site located in the KNP in response to a request from the Traditional Owner. The Proposal involves removing all legacy exploration infrastructure and core samples of the uranium, the Koongarra Source, currently being held onsite. All materials are to be transported offsite to rehabilitate the Proposal area. The Koongarra Source is licenced by ARPANSA; relevant laws and regulations will apply and be adhered to for the handling, transport and storage of the material until an appropriate disposal location is confirmed.

The Proposal is being referred to the NT EPA as a standard assessment in accordance with section 48(a) of the EP Act, to determine whether formal assessment and approval is required. This referral report has assessed the potential for the proposal to have a significant impact on the environment as defined in section 11 of the EP Act.

Pre-screening for the proposal identified the potential for significant impacts or uncertainty regarding potential impacts to four of the 14 NT EPA environmental factors. This referral report assessed the significance of residual impacts to each of these four factors, accounting for avoidance and mitigation measures. The assessment concluded none of the factors would be significantly impacted with effective implementation of avoidance and mitigation measures, and the environmental objectives for all factors will be met. A summary of the impact assessment is provided in Table 10-1.

Table 10-1. Summary of residual impacts

Environmental values	Potential impacts	Residual impact significance rating
Terrestrial environmental quality		
<p>Soils within the Proposal area are largely not considered a high erosion risk based on the NT Land Clearing Guidelines (DEPWS 2024). There is an area of steepness on the access track which crosses the Koongarra Saddle that has existing erosion.</p> <p>There is low activity naturally occurring radioactive material onsite that will be removed as part of the Proposal activities.</p>	<ul style="list-style-type: none"> Erosion and soil loss Contamination of soils from spills/leaks during handling, transport and storage of low activity naturally occurring radioactive material 	<p>The Proposal has potential to have a minor impact on Terrestrial Environmental Quality. The Proposal will have minor soil disturbance to remove infrastructure and due to movement of vehicles throughout the site; however, no land clearing or major soil disturbance is required. Standard erosion and sediment controls will be implemented to mitigate the risks further.</p> <p>The handling and storage of the radioactive materials is regulated under the ARPANSA and is subject to specific licence conditions to ensure effective management.</p> <p style="text-align: center;">Minor</p>
Terrestrial ecosystems		
<p>The Proposal area and access track is a disturbed site populated mainly by grasses with sparse tree cover and surrounded by savanna woodland.</p> <p>Based on the size of the Proposal area, the area has been determined as unlikely to contain critical habitat that supports any threatened flora and fauna species.</p>	<ul style="list-style-type: none"> Loss or degradation of habitat 	<p>The Proposal has potential to have a minor impact on Terrestrial Ecosystems. No land clearing is required, with vegetation disturbance restricted to temporary disturbance of 6.55 ha. Specific controls to mitigate weeds and dust emissions will be implemented.</p> <p style="text-align: center;">Minor</p>

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Environmental values	Potential impacts	Residual impact significance rating	
Culture and heritage			
<p>The Proposal area is in the KNP which is a listed World Heritage Site.</p> <p>The Proposal area and access tracks includes a number of registered sacred sites.</p> <p>There are no sites on the NT Heritage Register.</p>	<ul style="list-style-type: none"> • Degradation of sacred sites 	<p>The Proposal has potential to have a minor impact on Culture and Heritage. OSS have obtained an AAPA Certificate to undertake works on the access track and Proposal area. There are specific conditions outlined in the AAPA certificate that will be adhered to in undertaking the Proposed works.</p>	<p>Minor</p>
Human health			
<p>There is low activity naturally occurring radioactive material onsite in the Proposal area.</p> <p>The Proposal area and the JFS storage area do not have public access.</p> <p>The transport of the low activity naturally occurring radioactive material from the Proposal area to the JFS will be on a public road.</p>	<ul style="list-style-type: none"> • Exposure to radiation 	<p>The Proposal has potential to have a minor impact on Human Health. The low activity naturally occurring radioactive materials will be handled, transported and stored in accordance with ARPANSA approvals.</p>	<p>Minor</p>

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APPENDIX A PROPOSAL AREA COORDINATES

VertIDt	Latitude	Longitude
1	-12.8631	132.8495
2	-12.8631	132.8495
3	-12.8631	132.8496
4	-12.8678	132.8516
5	-12.8918	132.8545
6	-12.8989	132.8505
7	-12.899	132.8501
8	-12.894	132.8396
9	-12.8846	132.8374
10	-12.8823	132.8394
11	-12.8795	132.8401
12	-12.8792	132.84
13	-12.8791	132.8401
14	-12.8778	132.836
15	-12.8739	132.8352
16	-12.8696	132.836
17	-12.8694	132.8362

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**APPENDIX B ABORIGINAL AREAS PROTECTION AUTHORITY
CERTIFICATE**

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APPENDIX C ARPANSA LICENCE FIELD TRIP REPORT JUNE 2023

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APPENDIX D KOONGARRA CAMP INVENTORY – MAY 2013

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APPENDIX E ASBESTOS REPORT AND REGISTER

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APPENDIX F ASBESTOS CLEARANCE CERTIFICATE

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APPENDIX G SAMPLING AND ANALYSIS QUALITY PLAN (SAQP)

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**APPENDIX H DESKTOP LIKELIHOOD OF OCCURRENCE
ASSESSMENT**