Australian Government
Department of the Environment and Energy

Title of Proposal - South Capel Remediation Project

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Mining

1.2 Provide a detailed description of the proposed action, including all proposed activities.

Iluka Resources Ltd (Iluka) proposes to perform remediation works at the Capel Dry Plant (CDP) and South Capel mineral sands mining and processing site (Figure 1), known as the South Capel Remediation Project (SCRP). This remediation is being undertaken as part of Iluka's commitment to obligations under the WA Contaminated Sites Act 2003. All remediation activities are regulated by the WA Department of Water and Environmental Regulation (DWER) Contaminated Sites Branch under the Act.

The CDP commenced operation in the mid-1950s to process mineral sands. Historically, early management of mineral sands processing undertaken at the CDP resulted in the storage of by-products. The CDP is currently operational; however, current by-products are not stored at the site.

Mining and mineral separation commenced at South Capel in the mid-1950s and Synthetic Rutile (SR) processing commenced in 1968, including by-product storage facilities. The South Capel mining and processing areas have not supported production activities since operations ceased in 1999.

Iluka's groundwater monitoring has indicated there are levels of manganese and sulfate above environmental standards in the shallow groundwater directly underneath and adjacent to by-product storage areas at CDP and South Capel. The levels do not pose a risk to human health, but may impact water quality with respect to aesthetics (taste/odour). The levels pose a potential risk to the environment if left unabated. Therefore, Iluka proposes to commence activities to consolidate and contain the material impacting this shallow groundwater to minimise the potential for further contamination, and to allow a natural attenuation of the currently elevated levels.

Approximately 60,000 m3 of historic by-products stored at CDP and approximately 407,000 m3 from South Capel will be relocated to a purpose built consolidated storage facility at South Capel.

The proposed activities are as follows:
• construction of a new consolidated storage facility at South Capel, immediately north and adjacent to an existing storage area (Figure 2, Figure 3). This existing storage area, the Hutton

Road Containment Facility (HRCF), will be extended to accommodate by-products (HRCF Extension);
• placement of by-products from CDP into the HRCF Extension (Figure 4);
• placement of selected by-product areas at South Capel into the HRCF Extension (Figure 5);
• construction of an engineered cap comprising a bituminous geo-membrane (BGM) and a 0.5 m sand cover over the BGM; and
• excavation of clean fill from areas within the South Capel site and the Capel Mine Northern Extension (CMNE) sand supply area (Figure 6) for the above-mentioned sand cover.

By-products generally consist of acid effluent, Neutralised Acid Effluent (NAE), non-magnetic fines, char and iron concentrate. Residual radioactivity is present in limited quantities in some of the by-products, associated with naturally occurring radioactive materials (LWC 2018). The proposed sequencing of by-products within the HRCF Extension takes into consideration the placement of by-products with residual radioactivity (LWC 2018). The average activity of these by-products has been calculated to be approximately 0.3 Bq/g for CDP and approximately 0.5 Bq/g for the South Capel by-products proposed to be relocated into the HRCF Extension (LWC 2018). This compares to an average background radioactivity level of approximately 0.16 Bq/g at both sites (SKM 2013).

The proposed activities are to be constructed on already-disturbed land associated with historic mining and processing activities. The native vegetation at CDP is not remnant, having all been cleared for agriculture prior to development of the site. The existing vegetation at CDP has all been planted and / or has been recolonised from planted species or nearby vegetation (Ecoedge 2015). The majority of the remediation area at South Capel is represented largely by very sparse tall shrubs over a very open grassland, planted non-endemic eucalypts or bare ground, including un-vegetated by-product dams (Harewood 2018b). The CMNE sand supply area is within an area previously disturbed by mining and rehabilitated to agriculture (pasture).

Initial works will include clearing of regrowth vegetation, including separation of any entrained by-product and contaminated soil, and general preparation of the foundation of the HRCF Extension (i.e. backfilling). Vegetation may contain some traces of by-product and will therefore be dried and burned, with and the ash placed within the HRCF Extension (Wave 2018).

By-product shall be placed in the HRCF Extension at a minimum of 1 m above the groundwater level considered to be representative of local historical groundwater levels (LWC 2018). Any areas within the HRCF Extension footprint that do not provide the minimum 1 m will be backfilled to the necessary level with uncontaminated fill prior to placement of by-products. Current groundwater levels are closer to 2 m deep from the proposed base (LWC 2018).

The surface of the HRCF Extension will be graded to promote surface run-off, and prevent ponding and infiltration (Wave 2018). A perimeter drain comprising an existing drain and a new drain to be constructed will divert water from upstream of, and from the top of, the HRCF Extension (Figure 2). The existing drain will be refurbished to ensure it is able to accommodate the expected increase in surface water generation from the HRCF Extension. The new drain will divert surface water from upstream (offsite) catchments and will tie-in to the existing drain. The proposed new drain will ensure that significant ponding of surface water does not occur immediately adjacent to the HRCF Extension (Wave 2018).

Clearing has been minimised to only include the proposed action and areas required for access. Measures to avoid impact include retaining vegetation to prevent fragmentation (CDP), redesigning the diversion drain (South Capel) to avoid remnant native vegetation and a potential habitat tree, and modifying the HRCF Extension design (South Capel) to reduce clearing of fauna habitat. Further detail of measures to avoid and reduce impacts is provided in Section 4.1.

The remediation project is proposed to:
• facilitate long-term improvement of groundwater quality;
• reduce Iluka's long-term closure liabilities; and
• comply with obligations under the WA Contaminated Sites Act 2003.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
CDP	1	-33.546478076588	115.56744865031
CDP	2	-33.546478076588	115.56744865031
CDP	3	-33.545722489686	115.56746474356
CDP	4	-33.545722489686	115.56728235335
CDP	5	-33.544117404464	115.56728771777
CDP	6	-33.543987744467	115.56749693007
CDP	7	-33.543956447198	115.56913307757
CDP	8	-33.545963920539	115.56910089106
CDP	9	-33.545981804279	115.56823721976
CDP	10	-33.546478076588	115.56823185534
CDP	11	-33.546478076588	115.56744865031
South Capel	1	-33.582582646441	115.52496315413
South Capel	2	-33.582511141772	115.52496315413
South Capel	3	-33.580330220913	115.52504898482
South Capel	4	-33.575360375693	115.5292976039
South Capel	5	-33.572857467599	115.53084255629
South Capel	6	-33.569389032141	115.53577782088
South Capel	7	-33.568745389614	115.53564907485
South Capel	8	-33.562094135883	115.54363132888
South Capel	9	-33.562487503852	115.54410339766
South Capel	10	-33.562952390959	115.54358841353
South Capel	11	-33.563309994723	115.54401756697
South Capel	12	-33.56273782799	115.54500461989
South Capel	13	-33.562308700452	115.54461838179
South Capel	14	-33.562559025108	115.54410339766
South Capel	15	-33.562094135883	115.54376007491

Area	Point	Latitude	Longitude
South Capel	16	-33.558124595211	115.54916740828
South Capel	17	-33.558625268053	115.54993988448
South Capel	18	-33.559268986013	115.54912449294
South Capel	19	-33.561665005147	115.55084110671
South Capel	20	-33.566850192089	115.54071308547
South Capel	21	-33.566385325966	115.54028393202
South Capel	22	-33.566671397723	115.53959728652
South Capel	23	-33.567207779712	115.53994060927
South Capel	24	-33.569460547681	115.53577782088
South Capel	25	-33.572678685672	115.53586365157
South Capel	26	-33.574573755255	115.53384663039
South Capel	27	-33.57432346543	115.53088547164
South Capel	28	-33.575360375693	115.52955509596
South Capel	29	-33.578292261444	115.53273083144
South Capel	30	-33.579936934236	115.53062797957
South Capel	31	-33.582654151051	115.52873970442
South Capel	32	-33.582582646441	115.52496315413

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The CDP is located on Jenkin Road within the town of Capel. The proposed action will be undertaken on Lot 2 on Diagram 90768, Lot 56 on Plan 222236 and Lot 61 on Plan 222236.

The CDP is located within a previously agricultural (pasture) area that became the site of a mineral processing plant. The remediation area currently comprises an artificial lake into which process water was historically pumped, a constructed dam used as a source of water for firefighting (fire dam) and a by-product dam, all surrounded by planted and regrowth vegetation in varying densities. Access tracks and roads are present to access the areas.

South Capel is located on a previously disturbed area where the MSP was historically located for the mineral sand mine at South Capel (which has already been mined). The site is located 1.6 km south of the town of Capel.

The South Capel site comprises by-product storage and associated facilities (including roads and access tracks), as well as some revegetation and regrowth vegetation. The proposed action will be undertaken on WA Mining Act 1978 tenements M70/63 and M70/659, and includes Lot 7 on Diagram 26769, Lot 2039 on Plan 140224, Lot 3822 on Plan 153828, Lot 73 on Plan 63783 and Lot 100 on Plan 406668.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

Disturbance footprint: 84.34 ha; federally listed fauna habitat: 8.44 ha; avoidance area: 3.1 ha

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Multiple lots (see Section 1.5)

1.8 Primary Jurisdiction.

Western Australia

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 10/2018

End date 10/2020

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

CDP

***Environmental Protection Act 1986* Part IV**

The CDP was constructed and commissioned in the 1950s, prior to the enactment of the WA *Environmental Protection Act 1986*. There was no Part IV EP Act approval process associated with the construction of the plant. Consequently, there is no Part IV WA *Environmental Protection Act 1986* instrument in place.

Consultation with the Environmental Protection Authority (EPA) is planned for July 2018. Considering the nature of the proposed action and the existing approval instruments to manage the associated environmental impacts, the project is not expected to require assessment under Part IV of the EP Act.

Environmental Protection Act 1986 Part V

Works approvals and licences were first issued under Part V of the WA *Environmental Protection Act 1986* in 1991. This site is currently operating under Licence L6194/1989/14 (Category 8 – Mineral sands mining or processing).

Based on consultation with DWER Licencing Branch, no amendment to this licence is required for the proposed activities (D Hartnup – email dated 16 February 2018).

A Native Vegetation Clearing Permit application has been submitted to DWER for assessment on 10 May 2018.

Mining Act 1978

The CDP is not located on WA *Mining Act 1978* tenure and, therefore, is not regulated under the Mining Act.

Contaminated Sites Act 2003

In 2007, Iluka reported the CDP as a “known” contaminated site in accordance with the WA *Contaminated Sites Act 2003*. The DWER Contaminated Sites Branch subsequently declared the CDP to be a “source site” and classified it as “Possibly Contaminated – Investigation Required” on 25 November 2009. All remediation activities to which this permit application pertains will be managed under a Remedial Action Plan (RAP), endorsed by a DWER-Accredited Contaminated Sites Auditor and to be approved under the WA *Contaminated Sites Act 2003*.

Shire of Capel

The site is zoned Special Use area (for mineral sands processing, offices and ancillary uses) under Capel Town Planning Scheme 7.

South Capel

Environmental Protection Act 1986 Part IV

The South Capel operations were not assessed under Part IV of the WA *Environmental Protection Act 1986*. Consequently, there is no Part IV WA *Environmental Protection Act 1986* instrument is in place.

Consultation with the EPA is planned for July 2018. Considering the nature of the proposed action and the associated impacts, the project is not expected to require assessment under Part IV of the EP Act.

Environmental Protection Act 1986 Part V

A Works Approval application under Part V of the WA *Environmental Protection Act 1986* was

submitted to DWER on 20 June 2018. A Licence application will be will be submitted under Part V of the WA *Environmental Protection Act 1986* closer to completion of the works, as per DWER requirements.

Mining Act 1978

A Mining Proposal under Section 82A(2)(a) of the WA *Mining Act 1978* is required as the project is located on M70/63 and M70/659. A Mining Proposal application will be submitted to Department of Mines, Industry Regulation and Safety (DMIRS).

A Native Vegetation Clearing Permit application was submitted on 5 June 2018 to DMIRS for assessment under its delegated authority for the clearing of native vegetation associated with mineral activities regulated under the WA *Mining Act 1978*.

Contaminated Sites Act 2003

In 2007, Iluka reported South Capel as a contaminated site in accordance with the WA *Contaminated Sites Act 2003*. The DWER Contaminated Sites Branch classified South Capel as Contaminated – Remediation Required" and a 'source site' on 22 June 2017. All remediation activities to which this permit application pertains will be managed under a RAP, endorsed by a DWER-Accredited Contaminated Sites Auditor and to be approved under the WA *Contaminated Sites Act 2003*.

Radiation Safety Act 1975

The South Capel site is registered under the WA *Radiation Safety Act 1975*, Registration Number: RS 21/75 457 *Radiation Safety Act 1975* Certificate of Registration of Premises in which Radioactive Substances are to be used, stored or manufactured for Gauges – Industrial and Radioactive Ores – Mining and / or Processing.

Radiation is managed in accordance with Iluka's Southwest Operations Radiation Management Plan 2017 (Iluka 2017). An addendum to the Radiation Management Plan will be prepared to include the proposed HRCF Extension.

Rights in Water and Irrigation Act 1914

Groundwater abstraction is regulated by DWER (Water) under Iluka's groundwater licences, GWL171459 and GWL161847, under the WA *Rights in Water and Irrigation Act 1914*. No changes to these licences are anticipated for the project.

Shire of Capel

The site is zoned Rural under Town Planning Scheme 7. No change is anticipated to the zoning.

1.13 Describe any public consultation that has been, is being or will be undertaken,

including with Indigenous stakeholders.

Iluka has been consulting extensively with relevant stakeholders regarding the remediation project for the past 10 years since reporting the sites under the WA *Contaminated Sites Act 2003* in 2007, including the following:

- Private landowners and residents neighbouring the CDP and the South Capel site;
- Representatives of School Board for the Free Reformed School Association, newly built and operational John Calvin School near the CDP;
- Government agencies and authorities including:
  - Shire of Capel;
  - Main Roads WA;
  - Public Transport Authority;
  - Department of Biodiversity, Conservation and Attractions – Parks and Wildlife Service; and
  - Relevant utilities regarding easements (e.g. Western Power, Telstra, ATCO)
- Regulatory authorities including:
  - DWER Contaminated Sites Branch;
  - DWER Licensing
  - DWER Water Licensing;
  - Radiation Council of WA (RCWA) and
  - DMIRS.

Significant engagement efforts associated with the remediation of by-product at CDP destined for South Capel were undertaken in 2017 in the town of Capel. This included social media messaging, project information / fact-sheet advertised on Iluka's website, direct engagement at individual residences and an advertised drop-in information session hosted in Iluka's Capel office. Iluka also met with the State Member of Parliament, and presented to the Shire of Capel Councillors and senior staff.

Engagement with the owners of the sole private property adjacent to South Capel was undertaken prior to reporting of sites in 2007, and also following classification under the WA *Contaminated Sites Act 2003* in 2017. Most recently, members of the Iluka project team met with the owner at their residence to discuss the proposed action.

A community information day was held on 11 June 2018 which gave an update on the proposed design and selection of the remediation approach at both CDP and the South Capel site, and how Iluka are proposing to implement the remediation. The community information day was a drop-in set-up at the Iluka Capel offices and included access to currently prepared reports pertaining to the remediation, aerial photographs and drone footage. The community was invited to look at the various aspects of remediation design and have an opportunity to provide feedback. Community consulted included local residents, local members and the nearby school (to Capel).

Initial consultation with relevant agencies was undertaken at the time of reporting of sites in 2007, and specifically upon receipt of classification of sites under the WA *Contaminated Sites Act 2003* in 2017.

A combined meeting was held with DWER Licencing and Contamination Branches in December 2016 which included a site visit. This meeting outlined the need to develop a Works Approval for the South Capel component of the SCRP. The purpose of the meeting was to provide detail on the nature of the project including the technical, temporal and community / stakeholder aspects, and to promote discussion of the approvals pathway for the project. A further project update was provided to DWER Contaminated Sites officers in May 2017.

Additional formal consultation has been undertaken with DWER Licencing and Contamination Branches, also including a site visit, in May 2018 in anticipation of the various approval submissions. Other formal consultation has been undertaken with DMIRS and RCWA in Q2 2018, also regarding approval submissions.

Further formal consultation will be undertaken with community, landowners and regulators/external stakeholder groups as required. Consultation with the Environmental Protection Authority (EPA) is planned for July 2018.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

As outlined in Section 1.12, environmental impact assessments have been conducted for the proposed works as part of the development of the following documents:

- CDP Native Vegetation Clearing Permit application (WA *Environmental Protection Act 1986*).
- South Capel Native Vegetation Clearing Permit application (WA *Environmental Protection Act 1986*).
- Mining Proposal application – for South Capel (WA *Mining Act 1978*).
- Works Approval application – for South Capel (WA *Environmental Protection Act 1986*).
- CDP Remedial Action Plan (WA *Contaminated Sites Act 2003*).
- South Capel Remedial Action Plan (WA *Contaminated Sites Act 2003*).

These applications and plan were informed by the following reports and assessments:

- Ecoedge (2015). *Report of Level 1 Flora and Vegetation survey at the Capel Dry Plant, Capel*. Prepared for Iluka Resources Ltd, Perth, Western Australia.
- Endemic (2013). *South Capel Flora and Vegetation Assessment*, Prepared by for Iluka Resources Ltd, Perth, Western Australia.
- Harewood, G. (2010) *Terrestrial Fauna Survey (Level 1) of Capel Dry Plant Study Area, Capel.* Prepared for Iluka Resources Ltd, Perth, Western Australia.- Harewood, G. (2018a). *Fauna Assessment, Capel Dry Plant, South Capel Remediation Project*, Prepared for Iluka Resources Ltd. Perth, Western Australia.
- Harewood, G. (2018b). *Fauna Assessment, South Capel*, Prepared for Iluka Resources Ltd. Perth, Western Australia.
- Harewood, G. (2018c). *South Capel Remediation Project (SCRP): Assessment against Significance Guidelines with respect to Matters of National Environmental Significance,* Prepared for Iluka Resources Ltd. Perth, Western Australia.

- GHD (2017a). *Capel Dry Plant Hydrogeological Characterisation and Risk-based Contaminated Groundwater Management Assessment*. GHD Pty Ltd.
- GHD (2017b). *Capel Dry Plant Well Completion Report for New Risk Based Monitoring Infrastructure.* GHD Pty Ltd.
- Golder (2017a). *Combined Geotechnical and Chemical Investigation Report South Capel Remediation Project – Capel Dry Plant*. Golder Associates Pty Ltd.
- Golder (2017b). *Combined Geotechnical and Chemical Investigation Report South Capel Remediation Project - South Capel*. Golder Associates Pty Ltd.
- LWC (2018). *Conceptual Design Review, South Capel Remediation Project*, Prepared by Land & Water Consulting for Iluka Resources Ltd, Perth, Western Australia.
- URS (2003a). *Capel Separation Plant Contaminated Site Review*. URS Australia Pty Ltd.
- URS (2003b). *Review of Groundwater Contamination Capel Dry Plant*. URS Australia Pty Ltd.
- URS (2004). Capel Dry Plant Groundwater Investigation - Stage 1. URS Australia Pty Ltd.
- URS (2007). Capel Dry Plant Groundwater Contamination Review. URS Australia Pty Ltd.
- Wave (2018). *South Capel Remediation Project, HRCF Extension Engineering Design*. Prepared by Wave International for Iluka Resources Ltd, Perth. Western Australia.
- Waves Environmental (2014a). *Groundwater and Surface Water Investigations Capel Dry Plant and Immediate Surrounds Capel Western Australia*. Waves Environmental Pty Ltd.
- Waves Environmental (2015). *Targeted Soil Investigations (NAE Storage and Discharge Locations) Capel Dry Plant Capel Western Australia*. Waves Environmental Pty Ltd.
- Waves Environmental (2015a). *Residue Waste Characterisation Capel Dry Plant Capel Western Australia*. Waves Environmental Pty Ltd.
- Waves Environmental (2015b). *Targeted Soil Investigations (NAE Storage and Discharge Locations) Capel Dry Plant Capel Western Australia*. Waves Environmental Pty Ltd.

1.15 Is this action part of a staged development (or a component of a larger project)?

No

1.16 Is the proposed action related to other actions or proposals in the region?

No

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

Yes

2.3.1 Impact table

Wetlands	Impact
Vasse-Wonnerup RAMSAR Wetland (catchment)	The South Capel site is approximately 5 km from the Vasse-Wonnerup RAMSAR Wetland (Figure 7). The proposed action will not have a direct impact on the ecological character of the wetland. >>>> There will be minor changes to local drainage features in the local catchment

Wetlands	Impact
	(Ludlow River catchment), which forms a part of the larger catchment for the wetland. The change in the drainage features has the potential to result in the increased runoff from the HRCF Extension, a change to the amount of water from upstream catchments as a result of the diversion of upstream surface water ~850 m around the HRCF Extension, and has the potential to increase turbidity in the local catchment if not appropriately managed. The change in the site drainage features has the potential to result in an impact to the local catchment, therefore the proposed action has the potential to result in an indirect impact on the ecological character of the wetland. Refer to Section 5.2 for the assessment of significance. >>>> The Capel Dry Plant is located greater than 10 km from the Vasse-Wonnerup RAMSAR Wetland but was returned on the Protected Matters Search Tool for the CDP with a 1 km buffer. Groundwater is understood to flow towards the west-northwest in parallel with the Capel River (Iluka 2018) and therefore does not discharge into the Vasse-Wonnerup RAMSAR Wetland. As CDP is within the Capel River Surface Water Management Area (DoW 2007), the site is located outside the surface water catchments of the Vasse-Wonnerup RAMSAR Wetland. Therefore, as the CDP is located outside the surface water and groundwater catchments of the Vasse-Wonnerup RAMSAR Wetland, no direct or indirect impacts on the ecological character of the wetland are predicted.

2.3.2 Do you consider this impact to be significant?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Western Ringtail Possum (Pseudocheirus occidentalis)	The area to be disturbed at CDP is approximately 3.64 ha. The proposed action will clear ~1.34 ha of regrowth vegetation considered to be WRP habitat at CDP. >>>> The area to be disturbed at South Capel is comprised of clearing for the HRCF Extension, drains and by-product areas (46.49 ha) and the CMNE sand supply area (34.21 ha; not vegetated), totalling ~80.70 ha. The proposed action will clear ~7.10 ha of regrowth vegetation considered to be WRP habitat at South Capel. >>>> Total clearing for the proposed action is ~8.4 ha of regrowth vegetation considered to be WRP habitat. >>>> Iluka has minimised the clearing footprint at CDP to avoid 0.2 ha of vegetation that is potentially providing fauna habitat linkage and has minimised the clearing footprint at South Capel to avoid 2.9 ha of vegetation that is either remnant native vegetation or fauna habitat (refer to Section 4.1 for further information) >>>> Fauna surveys are provided within Attachment 13 and 14 of Appendix A. Detailed assessment of the limited extent and significance of the impacts to WRP is contained in Attachment 15 of Appendix A and a summary contained within Section 5.2.
Forest Red-tailed Black Cockatoo (Calytorhynchus banksii naso) Baudin's Black Cockatoo (Calytorhynchus baudinii) Carnaby's Black Cockatoo (Calyptorhynchus latirostris)	The area to be disturbed at CDP is approximately 3.64 ha. The proposed action will clear ~0.23 ha of regrowth vegetation considered to be black cockatoo foraging habitat. CDP contains 22 trees with a DBH of >50 cm. None of the trees appear to contain hollows of any size. No existing roosting habitat is present. >>>> The area to be disturbed at South Capel is comprised of clearing for the HRCF Extension, drains and by-product areas (46.49 ha) and the CMNE sand supply area (34.21 ha; not vegetated), totalling ~80.70 ha. The proposed action will clear ~0.70 ha of regrowth vegetation considered to be black cockatoo foraging habitat. South Capel contains 29 trees with a DBH of >50 cm. One of the trees proposed to be removed contains hollows; however, the tree is dead and the hollow is too

Species	Impact
	low (<5 m high) and too shallow to be considered suitable for use by black cockatoos (Harewood 2018b). One other tree containing two hollows possibly suitable for use by black cockatoos (Harewood 2018b) is within the boundary of the proposed action area, however, it will be demarcated and retained (refer to Section 4.1). >>>> Total clearing for the proposed action is ~0.93 ha of regrowth vegetation considered to be black cockatoo foraging habitat, and 51 trees with a DBH of > 50 cm with no hollows or hollows not considered suitable for black cockatoos will be cleared. >>>> Iluka has minimised the clearing footprint at South Capel to avoid 2.9 ha of vegetation that is either remnant native vegetation, a potential habitat tree or fauna habitat (refer to Section 4.1 for further information) >>>> Fauna surveys are provided within Attachment 13 and 14 of Appendix A. Detailed assessment of the limited extent and significance of the impacts to black cockatoos is contained in Attachment 15 of Appendix A and a summary within Section 5.2.
Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community	The Protected Matters Search Tool lists the TEC as possibly occurring at CDP and South Capel. >>>> Capel Dry Plant: The site was agriculture (pasture) prior to developing the CDP; the vegetation in the area is not a remnant (i.e. all planted or grown from planted/nearby species). The vegetation does not contain the diagnostic Banksia species as per Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community. Furthermore, the site is also considered to be in a Completely Degraded condition (Ecoedge 2015). Therefore, the area could not be considered to be the Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (Banksia Woodland TEC). >>>> South Capel: The area to be cleared does not align with the key diagnostic characteristics of the Banksia Woodlands TEC. The vegetation is Melaleuca preissiana and Kunzea glabrescens vegetation,

Species	Impact
	and not dominated by Banksia species (i.e. not Banksia Woodland TEC). The degraded condition of the area also precludes the presence of the Banksia Woodland TEC (Endemic 2013). >>>> Therefore, the SCRP will not have a direct or indirect impact on the Banksia Woodlands TEC at either Capel Dry Plant or South Capel.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

CDP

Vegetation

Based on aerial photography, the native vegetation at CDP is not remnant, having all been cleared for agriculture prior to development of the site. The existing vegetation has all been planted and / or has been recolonised from planted species or nearby vegetation.

Ecoedge (2015) carried out a Level 1 vegetation and flora survey of the CDP. Two vegetation units occur within the remediation area (Ecoedge 2015, Attachments 11 and 12 of Appendix A):

1. Cc/Er_pasture (~0.45 ha); *Corymbia calophylla* or *Eucalyptus rudis* over pasture or weeds: *Corymbia* calophylla or occasionally Eucalyptus rudis over mainly exotic grasses including **Avena fatua*, **Ehrharta longiflora*, **E. calycina*, **Eragrostis curvula* on red-brown loam. This vegetation unit is classified Completely Degraded according to Keighery (1994).

2. Planted; exotic eucalypts and other amenity species (~0.89 ha). This vegetation unit is not representative of any naturally occurring vegetation assemblage and as such, its condition was not assessed (Ecoedge 2015).

The rest of the area (~2.30 ha) includes infrastructure, dirt roads and bare ground, some of which includes recolonised vegetation (grassland with scattered trees).

These vegetation units are not representative of the pre-European Guildford and Swan vegetation complexes that were mapped for the area (Ecoedge 2015).

As a result of the site's high degree of historical disturbance and limited connectivity to other areas of bushland, biodiversity has been significantly reduced from its original levels.

No listed Threatened flora species were found within the area. The area does not intersect with any listed Threatened Ecological Community (TECs).

Fauna

Level 1 fauna surveys were undertaken in 2017 and 2018 by Harewood (2018a) to understand the fauna habitat values within the area. The following information is taken from Harewood

(2018a) report (Attachment 13 of Appendix A).

The survey found that the site was highly degraded, containing a minimal amount of native vegetation. The NAE dam has some limited regrowth in a central high point and is bordered by a grassland of introduced species, with highly degraded open woodland of marri to the west, and flooded gum and planted non-endemic eucalyptus to the north. Lake Mac is an artificial lake which has some open water and covered with a dense *Typha orientalis* reed bed which extends to the Fire Dam. Lake Mac and the Fire Dam are bordered by planted endemic and non-endemic eucalyptus trees and shrubs with some marri, flooded gum, peppermint (*Agonis flexuosa*), tuart (*Eucalyptus gomphocephala*) and paperbark (*Melaleuca* sp.) also being present (Figure 8).

Overall, the fauna habitat quality is poor as a result of the sites high degree of historical disturbance. Connectivity to other areas of bushland is also very limited with the patchy, degraded bushland along Gavin's Road providing a tenuous linkage to vegetation within the railway reserve to the east. These factors coupled with relatively small size of the subject site suggest that the biodiversity has been significantly reduced from its original levels with only a fraction of the original fauna assemblage likely to occur.

The desktop review indicated that 121 fauna species are listed as potentially occurring in the area; however, only six of these are conservation-significant fauna species. Most of the species were considered unlikely to use the area due to a lack of suitable habitat. Opportunistic fauna observations showed a total of 24 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the day and night time surveys.

The Level 1 reconnaissance survey confirmed that three Listed Threatened Fauna species were active in the area, Forest Red-tailed Black Cockatoo (*Calytorhynchus banksii naso*), Baudin's Black Cockatoo (*Calytorhynchus baudinii*) and the Western Ringtail Possum (*Pseudocheirus occidentalis).*

South Capel

Vegetation

The South Capel site occurs in the Southern River complex consisting of open woodland of *Corymbia calophylla – Eucalyptus marginata* – Banksia species with fringing woodland of *Eucalyptus rudis – Melaleuca rhaphiophylla* along creek beds.

Less than 30% of the pre-European distribution remains, however, the vegetation to be cleared is not representative of the Southern River Complex due to the site's history of disturbance (Endemic 2013, Attachments 16, 17 and 18 of Appendix A). The vegetation at the South Capel site consists predominantly of recolonised vegetation on historically cleared land. The CMNE sand supply area is within an area previously disturbed by historic mining and rehabilitated to agriculture (pasture).

Five vegetation units were mapped within the South Capel site (Endemic 2013):

1. Cleared / regenerating (~45.84 ha); Planted or regenerating areas with insufficient structure to be attributed to a native vegetation community (Endemic 2013). Includes the areas occupied by the existing by-product storages. Covers 98.6% of the area and is in a Degraded to Completely Degraded condition according to Keighery (1994).

2. Em (~0.17 ha); *Eucalyptus marginata* subsp. *marginata* (jarrah) scattered trees over *Banksia ilicifolia*, *Nuytsia floribunda* scattered low trees over *Kunzea glabrescens* high shrubland over *Melaleuca thymoides* scattered shrubs over *Dasypogon bromeliifolius* open herbland. Degraded to Completely Degraded condition.

3. Kg (~0.18 ha); *Kunzea glabrescens* open scrub over *Xanthorrhoea preissii*, *Calytrix fraseri* scattered low shrubs over *Dasypogon bromeliifolius* very open herbland. Good condition.

4. Mp (~0.17 ha); *Melaleuca preissiana* low closed forest over *Kunzea glabrescens* scattered tall shrubs over *Astartea scoparia* open shrubland over an open sedgeland. Degraded condition.

5. MpKg (~0.13 ha); *Melaleuca preissiana* low open woodland over *Kunzea glabrescens* closed scrub. Predominantly Degraded to Completely Degraded condition.

Whilst these areas (total of ~0.65 ha) have been assigned a vegetation unit by Endemic (2013), review of the Endemic (2013) and aerial photography from 1971 demonstrates that these areas are not remnant but, rather, are regrowth.

As a result of the site's high degree of historical disturbance, biodiversity has been significantly reduced from its original levels.

Endemic (2013) recorded 294 native species in the South Capel area and surrounds. One Threatened flora species, *Drakaea elastica* (Endangered), was recorded in three previously unrecorded areas in the eastern bushland adjacent to the proposed South Capel site. No Threatened Ecological Communities (TECs) were recorded during the Endemic (2013) survey.

Fauna

A Level 1 fauna survey was undertaken in 2017 and 2018 by Harewood (2018b) to understand the fauna habitat values of the vegetation within the area. The following information is taken from Harewood (2018b) report (Attachment 14 of Appendix A).

The survey found that the vegetation was highly degraded, with almost all of the area having been historically cleared for various activities related to mineral sands mining or processing. Subsequent to this clearing, the area has been subject to varying degrees of rehabilitation / revegetation. The majority of the area is therefore now represented by vegetation that has either been planted or has regrown naturally with the density of plant growth varying considerably from area to area.

The majority of the area is represented largely by very sparse tall shrubs (mainly *Acacia* sp.) over a very open grassland, planted non-endemic eucalypts or bare ground, including

unvegetated by-product dams. A peppermint low open forest has regrown in some areas. Areas of kunzea tall shrubland and flooded gum woodland represent the other most common native species dominated vegetation units present. Several artificial wetlands (some seasonal) are also present (Figure 9).

Overall, fauna habitat quality appears to be relatively low given the areas high level of historical disturbance and as a consequence the fauna assemblage is likely to be depleted, relative to the areas original biodiversity.

A total of 156 fauna species are listed as potentially occurring in the area; however, only six of these are conservation-significant fauna species. Most of the species were considered unlikely to use the area due to a lack of suitable habitat. Opportunistic fauna observations showed a total of 23 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the subject site during the day and night time surveys.

The Level 1 reconnaissance survey confirmed that three Listed Threatened Fauna species were active in the area, Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Baudin's Black Cockatoo (*Calytorhynchus baudinii*) and the Western Ringtail Possum (*Pseudocheirus occidentalis).*

3.2 Describe the hydrology relevant to the project area (including water flows).

CDP

Within the dunal and sandplain terrain, the Bassendean Sand (See Section 3.3 for a description of the soils) forms the unconfined water table aquifer. The water table is recharged by direct infiltration of rainfall (Iluka 2018). Groundwater flow is north-westerly, presumably towards the Capel River and tributaries (Iluka 2018).

Upper surfaces and portions of the Leederville Formation comprise dark grey and black carbonaceous mudstone/shale beds. Commonly, these beds are of low transmissivity and form a confining layer that limits the hydraulic connection with the overlying superficial formations (Iluka 2018). Water table elevations beneath the CDP are observed in a range from approximately 7 to 14 mAHD (Iluka 2018).

There are no natural water bodies or drainage lines through the CDP area. The site contains Lake Mac, an artificial lake, which was historically used to dispose of process water and required remediation. Lake Mac has some open water and covered with a dense *Typha orientalis* reed bed which extends to the Fire Dam. The nearest natural surface water features comprise two creeks located approximately 200 m to the south and approximately 500 m to the north. Both of these creeks are ephemeral and, when water is present, these flow towards the northwest and the Capel River (Iluka 2018).

South Capel

The aquifers located within the South Capel area include the following:

- Superficial Formation – an unconfined aquifer comprised predominantly of unconsolidated sands and silts. It overlies the Leederville Formation and is generally 10 m to 15 m thick. The Superficial Formation supports many wetlands in the area.
- Leederville Formation – a semi-confined or sub-artesian aquifer consisting of interbedded sandstone, siltstone and shale. It may be up to 180 m thick and overlies the Yarragadee Formation. In the vicinity of the South Capel site, the Leederville Formation is met at a depth of about 10 m – 15 m. It is characterised by a naturally slightly elevated salinity.
- Yarragadee Formation – a confined or artesian aquifer consisting of sandstone, shale and siltstone. In the Capel area, it is located at a depth of about 70 m and extends to a depth of about 1000 m. It is the most utilised aquifer in the region providing much of the town water supplies for the Shires of Capel and Busselton.

The Superficial Formations are comprised of the Spearwood and Bassendean Dunes (dunal terrain) and the clayey soils of the Guildford Formation (Pinjarra Plain). The superficial formations form the water table, which is recharged by direct infiltration of rainfall. They overlay the Leederville Formation which contains significant fresh groundwater resources. There is a vertical downwards head gradient from the superficial formations to the Leederville Formation. Groundwater in these aquifers generally flows in a north-westerly direction from the Whicher Scarp to the coast.

Groundwater levels are variable across the South Capel site, ranging between 0.4 m and 15 m below ground level. The salinity of the superficial aquifer generally ranges between 500 mg/L and 1000 mg/L total dissolved solids (TDS) (URS 2003).

The natural surface drainage system surrounding the South Capel site consists of a series of small tributaries and wetlands draining south towards the Ludlow River to the Wonnerup Estuary, and in a west-north-west direction via the Capel River, ultimately into Geographe Bay. Numerous natural and constructed channels and drains feed water into the tributaries of the Ludlow River to the south and Capel River via Layman Gully to the north-west.

3.3 Describe the soil and vegetation characteristics relevant to the project area.

CDP

The site is underlain by sedimentary formations of the southern Perth Basin. Shallow sedimentary profiles are characterised by Quaternary superficial formations of the Kwinana Group, which unconformably overlie the Leederville Formation, of the Warnbro Group, and the Yarragadee Formation.

The local superficial formations are composed of Bassendean Sand (dunal and sandplain systems), Spearwood Dunes (dunal systems) and the Guildford Formation (fluvial and alluvium deposits associated with drainage systems on the Pinjarra Plain).

Based on drill hole data, the superficial formations locally extend to depths typically in the order of 15 m and broadly comprise superficial sand, with thickness up to 3 m, derived in-part of

quartzose medium sand fractions from the HMC refinement and interbedded clayey sand, sand and clay beds likely of the Guildford Formation.

Vegetation characteristics are outlined within Section 3.1.

South Capel

Soils of the South Capel site are Bassendean Sands. The area to the west of the Bussell Highway exhibits heavier soils representing the surface expression of the Guildford Formation.

Operations commenced at the South Capel site at a time when the retention of topsoil, subsoil and overburden during mine development was neither a regulatory requirement nor standard practice of the day. Consequently, not all topsoil was retained for future rehabilitation activities.

Vegetation characteristics are outlined within Section 3.1.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

Nil.

3.5 Describe the status of native vegetation relevant to the project area.

CDP

Historically cleared regrowth vegetation that is Completely Degraded, as per Ecoedge (2015) report and outlined in Section 3.1.

South Capel

Historically cleared regrowth vegetation that is Degraded to Completely Degraded with one small area of Good vegetation, as described by Endemic (2013) report and outlined in Section 3.1.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

CDP

The gradient is between 10 to 15 mAHD, with areas built up to 18.5 mAHD within the processing area and within some of the by-product dams.

South Capel

The pre-disturbance topography was generally between 10 and 20 mAHD. As a result of mining operations, the area has been extensively cut and filled.

3.7 Describe the current condition of the environment relevant to the project area.

CDP

Completely Degraded; the remediation area (project area) is located within a previously agricultural (pasture) area that became the site of a mineral processing plant. The site contains legacy by-product storage areas which require remediation to ameliorate groundwater quality in the area. The remediation area is surrounded by rural lots and roads.

South Capel

Degraded; the remediation area is located within a former mining and processing site containing legacy by-product storage areas associated with mineral processing which require remediation to ameliorate groundwater quality in the area.

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

Nil.

3.9 Describe any Indigenous heritage values relevant to the project area.

Nil.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

The CDP is located on freehold lots: Lot 2 on Diagram 90768, Lot 56 on Plan 222236 and Lot 61 on Plan 222236.

The South Capel is located on WA *Mining Act 1978* tenements M70/63 and M70/659, on freehold lots: Lot 7 on Diagram 26769, Lot 2039 on Plan 140224, Lot 3822 on Plan 153828, Lot 73 on Plan 63783 and Lot 100 on Plan 406668.

3.11 Describe any existing or any proposed uses relevant to the project area.

CDP

Current use is for processing.

South Capel

Use was historically for mining and ancillary operations (processing).

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

Measures to avoid impact

Clearing is necessary to fulfil Iluka's commitment to obligations under the WA *Contaminated Sites Act 2003*. The proposed clearing is for a remediation project within the boundaries of historic mining and processing sites.

There is limited scope to reduce the area of clearing, considering the location of historic stockpiles, by-product dams and infrastructure requiring remediation. Vegetation has grown within some of the areas such as on batter slopes and in some cases, through by-product stockpile areas.

Clearing is required to enable remediation activities for an eventual closure of the sites. The clearing areas include a buffer to ensure that remediation activities are contained within these areas. The clearing has been minimised as much as reasonably practicable to safely access and excavate the known and probable extent of by-product required to be removed, and to allow for safely negotiating site works around existing buildings and infrastructure, including underground and overhead utilities.

Measures to avoid impact include:

- retaining vegetation to prevent potential fragmentation of habitat at CDP, thereby reducing western ringtail possum (WRP) habitat to be cleared;
- locating the HRCF Extension at South Capel within an already cleared and degraded area;
- redesigning the diversion drain at South Capel to avoid clearing of remnant native vegetation and a potential black cockatoo habitat tree; and
- modifying the HRCF Extension design at South Capel to reduce clearing of WRP habitat.

These measures are detailed in the following sections.

Avoiding potential fragmentation

Harewood (2018a) concluded that the vegetation to be cleared at CDP was only tenuously linked to the railway reserve to the east which is habitat for the WRPs. However, a belt of trees along the western and northern edges of the remediation area will be retained to enable continuation of that linkage (Figure 8), resulting in 0.2 ha to be retained, reducing the WRP habitat to be cleared by approximately 13% (from 1.5 ha to 1.3 ha).

Site selection

Iluka carried out an internal options evaluation in 2016 to analyse the feasibility of by-product relocation and capping strategies for the South Capel site. Iluka also carried out a data gap analysis and conceptual site model in 2016 (Iluka 2016) to review the existing investigations that had been undertaken to date, produce a conceptual site model and identify data gaps.

The selected option provides one consolidated landform (the HRCF and HRCF Extension) to manage, provides a deeper area to store different types of by-product within selected regions, reduces the amount of land affected and is the most cost effective in the long-term (considering ongoing management costs, etc.). It will benefit matters of NES by being located within an already cleared and heavily disturbed area within the boundaries of historic mining and processing sites.

Location of the diversion drain

Early designs of the HRCF Extension identified the need for a diversion channel on the east side of the extension to direct surface water to a north and north-west direction.

The original design of the diversion drain was located within remnant native vegetation to the east of the proposed HRCF Extension. To avoid this vegetation, the drain was relocated adjacent to the proposed HRCF Extension within previously cleared areas, avoiding approximately 2 ha of remnant native vegetation, likely to be habitat for listed fauna species (Harewood 2018b).

A fauna survey by Harewood (2018b) found 30 potential habitat trees suitable for use by black cockatoos within the South Capel remediation area; however, only one tree with suitable hollows was identified at the site (Figure 9). This tree was located within the diversion drain batter and, whilst the tree has not been used by black cockatoos to date (Harewood 2018b), Iluka will not remove this tree, reducing clearing of potential black cockatoo habitat trees to 29. The design of the diversion drain has been reviewed to leave this tree in situ with an exclusion zone (~5 m) where no clearing will take place.

Design of the HRCF Extension

Fauna survey by Harewood (2018b) confirmed the presence of WRPs and their habitat within regrowth vegetation on site. The best quality habitat which contains the densest midstorey component is the area dominated by peppermint open forest, mainly along the western side of the proposed HRCF Extension.

The design was amended to narrow the facility on this western side resulting in retaining

approximately 0.9 ha of the peppermint habitat initially proposed to be cleared. This redesign has included controls to ensure a safe, stable landform remains that can be integrated with the existing HRCF, and that drainage around the site is effective.

Measures to reduce impact

Procedure for clearing of vegetation

Prior to clearing, 'no-go' areas and working areas shall be defined / delineated and will be communicated to all site personnel undertaking the clearing activities.

Any clearing to be undertaken shall be appropriately demarcated. Demarcation (survey flagging tape, etc.) that identifies clearing boundaries shall be unique to this activity and not easily confused with other markers used on site. The proposed clearing boundary shall be installed prior to clearing commencing.

The following clearing controls will be in place to prevent unplanned, excessive or unapproved clearing, and to minimise impacts to fauna:

- Clearing will be undertaken during daylight hours.
- Clearing will be authorised by Iluka via a Ground Disturbance Permit, and will ensure clearing is undertaken in accordance with regulatory approvals.
- Adopting, where possible, a clearing pattern that encourages the movement of fauna to adjacent habitats.
- A suitably qualified 'fauna spotter' will be on-site when clearing is being undertaken for the entirety of the vegetation clearing. This fauna spotter will inspect trees immediately prior to clearing and allow fauna the opportunity to evacuate (i.e. if within a tree being felled). Anyone who is to handle fauna during clearing will hold a current Regulation 15 (fauna relocation and / or education) or a Regulation 17 (scientific / study) license under the WA *Wildlife Conservation Act 1950* (or similar Regulation under the WA *Biodiversity Conservation Act 2016*, whichever is in use).

Native Vegetation Clearing Permits required under the WA *Environmental Protection Act 1986* have been submitted for the sites. As the clearing area is already highly disturbed and the purpose of clearing is for remediation, only uncontaminated soil from cleared areas will be retained for use in backfilling and rehabilitation. Uncontaminated topsoil will be stripped to a nominal depth of approximately 100 mm and stockpiled for potential later re-use.

Vegetation contaminated with process by-product will be stockpiled for drying and burning. Burnt material will be disposed into the HRCF Extension.

Relocation of western ringtail possums

At CDP, Iluka proposes to relocate the WRPs (estimated to be approximately 10 individuals) from the remediation area and the area to the west of the remediation area. The likely location for the relocation of the WRPs at CDP is a nearby rail and road reserve. Harewood (2010) conducted a Level 1 survey of the fauna and habitat values of native vegetation in the rail and

road reserves located to the east of the CDP. This rail and road reserve contains habitat for Threatened fauna species such as WRPs and black cockatoo species, and is actively used by Threatened fauna species. It also has value as an ecological linkage / wildlife corridor (Harewood 2010).

At South Capel, Iluka proposes to relocate the WRPs from the remediation area prior to clearing areas of suitable habitat. Individuals will likely be relocated to the adjacent areas of remnant vegetation to the east of the HRCF Extension, as advised by a fauna specialist.

The particulars of the trapping and relocation program will be developed with input from a suitably qualified fauna specialist. As mentioned in Section 2.1, anyone who is to handle fauna will hold a current Regulation 15 or Regulation 17 license under the WA *Wildlife Conservation Act 1950*.

Surface water flows

The current drainage line located to the north and west of the HRCF Extension will be used to capture surface water runoff from the adjacent batter slopes in addition to redirecting surface water from the surrounding area around the structure. A new drain will be constructed around the foot of the eastern portion of the HCRF Extension to tie into the aforementioned existing drainage line.

The proposed new drain ensures rainfall run-off water from the eastern catchment (off site) is not trapped by the proposed HRCF Extension, and will ensure surface water will continue to be delivered to downstream receptors in a manner similar to before the works.

The proposed new drain has been sized for the 1:100 year average recurrence interval storm events.

The top of the HRCF Extension will be inward ‘draining’ with surface water flowing to the northeast and through an engineered drop structure to intersect with the surface water drain infrastructure. Surface water monitoring will be undertaken quarterly, as per current monitoring program, which will form part of the site Licence under the WA *Environmental Protection Act 1986*.

Remedial Action Plans

Iluka reported the CDP and South Capel in 2007 as contaminated sites in accordance with the WA *Contaminated Sites Act 2003*.

As part of this process, DWER-accredited Contaminated Sites Auditors have been appointed for each site. All remediation activities will be managed under the WA *Contaminated Sites Act 2003* and are subject to review by the Auditors. Remedial Action Plans (RAPs) for the CDP and South Capel sites have been reviewed by the Auditors prior to submission to DWER (Contaminated Sites Branch) and the Auditors have provided in-principle approval of the RAPs.

The RAPs describe the works to be undertaken to deliver the remedial objectives in a manner

that is consistent with relevant contaminated sites guidelines. The RAP includes minimum environmental management requirements to be implemented via a Remediation Contractor (to be determined via a tender process). This will include a Construction Environmental Management Plan (CEMP) prepared by the Remediation Contractor that addresses Iluka's environmental management objectives, standards and minimum requirements, submitted to the relevant Auditor for approval prior to the commencement of works.

A Conceptual Design Report by LWC (2018) supported the measures within the RAP. The LWC (2018) report provides the design of the HRCF Extension, integrating the findings of all previous investigations and demonstrating the suitability of the proposed design provide a safe and stable landform, reduce leachate generation potential and provide a remediation solution that is optimised in respect of economic, environmental, technical, and social factors.

The Engineering Design for the HRCF Extension was undertaken by Wave International (Wave 2018). The Wave (2018) document also covered the review of existing geotechnical investigation, testing and findings, and review of previous remediation options analyses and preferred remediation approach.

Fencing and traffic management

The RAP includes environmental management including but not limited to erection of fencing (in addition to current site boundary fencing), bunding and warning signs. Traffic shall be confined to nominated roads and tracks, and traffic will be managed to ensure the safe and efficient control of mobile equipment, including company vehicles.

Other environmental management

Dust control

Dust management activities include:

- visual monitoring of dust emissions, particularly during seasonal conditions that are conducive to dust creation;
- use of water trucks to dampen soils on roads or during rehabilitation earthworks if visual monitoring identifies significant dust emissions;
- changing dust creating works (i.e. earthmoving) on high dust-risk (windy) days; and
- avoiding moving topsoil and subsoil in summer, if practicable.

The relocated by-product storage locations will be contoured, backfilled with clean fill (where required) and planted with a grass cover (as final land use at the site has not been confirmed).

Erosion control

The BGM cover has been selected above HDPE or other liners as it has high UV resistance, it has a very low permeability coefficient of 6x10-14 m/s, it has high puncture resistance and has a lower coefficient of thermal expansion compared to other geomembranes (Wave 2018). The 0.5 m capping layer is proposed to be sand or silty sand compacted to approximately 90%

maximum dry density (MDD) at optimum moisture content (Wave 2018). The surface of the HRCF Extension will be established using a pasture seed blend (Iluka 2018).

Measures to provide protection from surface water erosion and control of sediment at the HRCF Extension may include but are not limited to:

- matting (such as biodegradable or permanent);
- sediment fences;
- permanent diversions;
- check dams;
- temporary drains and diversions; and
- plastic sheeting.

The CEMP will outline the surface water management requirements to ensure that there is no off-site surface water discharge from remediation areas during the active remediation work.

Settlement control

Compacted fill will be placed through any areas requiring uplift to ensure that the subsequent by-products are placed at least 1 m above groundwater level considered to be representative of local historical groundwater levels (LWC 2018).

The by-product that will be relocated and placed in the proposed HRCF Extension will be compacted in approximately 300 mm layers to around 90% MDD at optimum moisture content, to reduce any long-term settlement. The compaction levels will reduce the risk of excessive settlement, compromised cap integrity or drainage issues occurring over the lifetime of the HRCF Extension (Wave 2018).

Noise and light

Construction and relocation of by-products is planned to be undertaken between 7 AM and 7 PM, and during daylight hours. Therefore, noise and light impacts are not considered to be a relevant consideration for listed Threatened fauna species.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

Outcomes to be achieved for matters protected by the EPBC Act include:

- Black cockatoos: While some clearing of habitat is proposed, based on the extent and condition, and the management measures outlined in Section 4.1, the outcome is that no impacts to black cockatoos are predicted.

- WRP: While some clearing of habitat is proposed, based on the extent and condition, and the management measures outlined in Section 4.1, the outcome is that no impacts to WRPs are predicted.

- Vasse-Wonnerup RAMSAR Wetland: Based on the expected negligible input of surface water (quantity and quality) from the proposed action, the outcome is that no impact is expected for the wetland.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

Black cockatoos

As outlined in Attachment 15 of Appendix A, the proposed action will not have a significant impact on black cockatoo habitat when assessed against the significant impact criteria for endangered and vulnerable species in *Matters of National Environmental Significance, Significant Impact Guidelines 1.1, EPBC Act* (Commonwealth of Australia 2013), and against the guidance on the actions that have the potential for a significant impact on black cockatoos in *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered)* Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable)* Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable)* Calyptorhynchus banksii naso (Commonwealth of Australia 2012).

This conclusion is justified when considering the small areas involved, poor quality of much of the habitat, lack of current breeding activity and the presence of thousands of hectares of better quality habitat in nearby areas, much within Reserves and National Parks (Harewood 2018c).

Clearing will not create a barrier to black cockatoo movement in the area nor fragment habitats (Harewood 2018c). The proposed action is not at the range extent for all three of the black cockatoo species habitat; the Capel area is well within their range (Commonwealth of Australia 2012).

In summary, the proposed action will not have a significant impact on black cockatoo species for the following reasons:

- No roosting trees will be disturbed.

- Both areas are considered to contain limited foraging habitat value, with 0.94 ha of potential foraging habitat being cleared.

- No breeding trees will be disturbed. One tree with hollows potentially suitable for breeding (located within the disturbance boundary at South Capel) will be retained.

- Both areas (CDP and South Capel) are adjacent to or in close proximity to Reserves / National Parks containing better quality areas of suitable habitat (Figure 10).

WRP

As outlined in Attachment 15 of Appendix A, the proposed action will not have a significant impact on WRP populations or species when assessed against the significant impact criteria for critically endangered species in *Matters of National Environmental Significance, Significant Impact Guidelines 1.1, EPBC Act* (Commonwealth of Australia 2013), and against the guidance on the actions that have the potential for a significant impact on WRPs in *Significant Impact Guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia* (Commonwealth of Australia 2009a). In addition, the proposed action will not have a significant impact on WRP populations or species when assessed the criteria within the background paper to the guidance (Commonwealth of Australia 2009b).

This conclusion is supported by the fact that proposed clearing in both areas is largely regrowth or planted vegetation from previous mining or mining related activities, the works footprint in both cases is relatively small compared to the available WRP habitat within 12 km of each site, most of which is within Reserves and National Parks, and is expected to be of better quality than the site.

WRPs present at both sites are not near the limit of the species range, and the small numbers of individuals present are also unlikely to represent key source populations (Harewood 2018c). Given the small number of individuals likely to be present at each location, they are also unlikely to be necessary for maintaining genetic diversity in the species (Harewood 2018c). Individuals are to be relocated nearby and their genetic contribution will therefore be maintained and not lost.

The removal of the vegetation will not fragment any linkages to other areas (Harewood 2018c). There are large areas of habitat in adjoining and nearby areas likely to also support WRPs (Harewood 2018c). Only a small number of WRPs will be displaced at each site and the species can be expected to persist in adjoining and nearby areas (Harewood 2018c).

In summary, the proposed action will not have a significant impact on WRPs for the following reasons:

- No remnant WRP habitat areas will be cleared – all vegetation to be cleared is either planted or regrowth.

- WRP habitat to be cleared is considered poor quality vegetation (Endemic 2013; Ecoedge 2015) and is not remnant vegetation.

- The WRP habitat to be cleared comprises a small percentage of the overall WRP habitat within a 12 km radius of the disturbance sites (Figure 10).

- WRPs occupying areas to be cleared will be relocated to surrounding suitable habitat.

- Habitat linkages will be maintained.

Ramsar Wetland

The South Capel site is approximately 5 km from the Vasse-Wonnerup RAMSAR Wetland (Figure 7). Groundwater flows from the South Capel site in a north-westerly directly and discharges to the ocean approximately 4.5 km north of the Vasse-Wonnerup RAMSAR Wetland (Varma et al 2010). As the South Capel site is located outside of the Vasse-Wonnerup groundwater catchment, groundwater flows from the South Capel site are not expected to impact this wetland.

Four rivers drain into the Vasse-Wonnerup RAMSAR Wetland: Sabina River, Vasse River, Abba River and Ludlow River (DoW 2010). The annual average flow for these rivers is approximately: Sabina River – 11,000 ML/year; Vasse River – 37,200 ML/year; Abba River – 16,600 ML/year; Ludlow River – 14,200 ML/year (DoW 2007). The total from these rivers is approximately 79,000 ML/year (of average flows).

The proposed action (at South Capel) is within the Ludlow (River) catchment (~208 km2) located within the Wonnerup Water Management Sub-area (~477 km2) (DoW 2007). The Wonnerup Water Management Sub-area and the Vasse Surface Water Management Sub-area (~283 km2; DoW 2007) contain the Vasse-Wonnerup RAMSAR Wetland and are likely to be the catchment areas for the wetland (total ~760 km2). The HRCF Extension is ~0.29 km2 which equates to 0.14% of the total Ludlow catchment area and 0.04% of the Vasse-Wonnerup RAMSAR Wetland catchment area.

The HRCF Extension will be capped with a 0.5 m thick sand or silty sand layer compacted to 90% Maximum Dry Density over a Bituminous Geomembrane (BGM) liner. The surface of the capping will be planted with pasture species. A large proportion of the water that will fall on the HRCF Extension will be stored within the sand cap and evaporate (via evapotranspiration). Some surface water is expected to flow off the HRCF Extension, collected with subsurface drain pipes within the sand layer and down through an engineered drop structure which will tie into the existing drainage line. Sediment control will be implemented via berms placed on the upper surface of the HRCF Extension to manage erosion. A large proportion of surface water discharged to the existing drainage line is expected to seep into groundwater or evaporate. Discharge of water will be managed via the State Licence (to Operate) required under the WA *Environmental Protection Act 1986*.

If surface water flows offsite, before this surface water can get to the Ludlow River approximately 4 km south, it will traverse through existing artificial wetlands to the south of the South Capel site (Figure 7); surface water would also potentially seep into groundwater or evaporate during this time.

Based on modelling conducted by LWC (2018), the amount of water expected to be shed by the

HRCF Extension (after evapotranspiration) in a year on average is approximately 9 ML (maximum expected is approximately 47 ML), which equates to 0.06% (0.33% maximum) of the average amount of surface water flowing into the Ludlow River and 0.01% (0.06% maximum) of the water flowing into the Vasse-Wonnerup RAMSAR Wetland. This is a conservative estimate as it does not consider seepage into groundwater or evaporation downstream of the site, or groundwater discharges within the Vasse-Wonnerup RAMSAR Wetland.

Water quality issues at the Vasse-Wonnerup RAMSAR Wetland relate mainly to nutrient enrichment due to nitrogen and phosphorus loads from the catchments feeding into the wetlands (DoW 2010). No added impact is expected to nutrient levels as the amount of surface water expected to reach the wetland that can be attributed to proposed action is negligible, and the remediation activities at the site would not add to nutrient levels.

The design of the HRCF Extension includes drainage to divert upstream surface water flows around the facility and, while surface water will traverse a longer route (from ~550 m to ~1,400 m based on aerial photography) through the site, downstream flows will be maintained and therefore no impact is expected to the Vasse-Wonnerup RAMSAR wetland located ~9 km downstream (Figure 7).

Therefore, given the measures to control erosion during construction and operation of the facility, the negligible volume of site discharge compared to Vasse-Wonnerup inflows, the distance to the Ludlow River and consequently, the distance to the wetland from the HRCF Extension, the proposed action will not impact upon water quality or quantity in the Vasse-Wonnerup RAMSAR wetland.

In summary, the proposed action will not have a significant impact on the Vasse-Wonnerup RAMSAR Wetland for the following reasons:

- Groundwater does not flow from the remediation sites towards the wetland.

- Water flows from upstream catchments will be maintained by diverting surface water around the South Capel site.

- Quantity of water flow from the HRCF Extension is expected to be on average 0.01% (maximum 0.06%) of the annual flow into the Vasse-Wonnerup RAMSAR Wetland.

- Quality of water is not expected to be impacted due to the dilution factor as described in the previous point and the sediment controls being implemented at the South Capel site such as:

  - berms placed on the upper surface of the containment facility to manage erosion and prevent surface water from flowing directly over the batter slopes;

  - surface water leaving the site flows through several wetlands which assist in removing any sediments in the water; and

  - a CEMP will be in place to manage surface water during construction.

Any discharge of water will be managed via the State Licence (to Operate) required under the WA *Environmental Protection Act 1986*.

Conclusion

The remediation activities will be managed under State processes, namely:

- Remedial Action Plans required under the WA *Contaminated Sites Act 2003*;

- Native Vegetation Clearing Permit applications required under the WA *Environmental Protection Act 1986*;

- Works Approval application required under the WA *Environmental Protection Act 1986*; and

- Mining Proposal application under the WA *Mining Act 1978*.

No significant impacts are predicted for the identified MNES. The intent of the proposed action is to improve the quality of the environment by consolidating and containing by-products to ameliorate groundwater quality, which will improve the general condition of the environment and therefore, would be of benefit to MNES.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

Iluka's environmental management is underpinned by the company's health, safety, environment and community system which guides the company in demonstrating leading practice in these areas through all business activities – from exploration, planning, research and project development, through to operation, rehabilitation and closure.

Activities are conducted such that adverse impacts on existing and potential environmental values, including ecosystem function, abundance, diversity, distribution, integrity and productivity, are understood and minimised. The individual environmental requirements of each site are considered and site specific procedures and work instructions are developed in compliance with Iluka's management system.

Iluka recognises that compliance with legislative requirements is a minimum standard that should be achieved while performing at, or beyond legal requirements.

Iluka reports on its environmental management activities annually, including land rehabilitation and closure, water use, mineral waste management, biodiversity and product stewardship, via sustainability reporting (reporting period 1 January to 31 December).

For example, for the Tutunup South mineral sands mine (EPBC 2007/3441) Iluka prepared Annual Compliance Reports during operation of the mine which outlined the wider obligations for the project (including Federal and State obligations) and the compliance status specifically for the Federal obligations (i.e. the EPBC Act approval, EPBC 2007/3441).

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

There are no past or present proceedings against Iluka under Commonwealth or State environmental law.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

Iluka has a Health, Safety, Environment & Community Policy signed by the CEO. The policy reflects Iluka's values of Commitment, Integrity and Responsibility by targeting high levels of performance and pursuing leading practice in the areas of health, safety, environment and community.

See attached for the full policy or on the Iluka website:

http://www.iluka.com/sustainability/sustainability-governance.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

Iluka has referred the following projects under the EPBC Act.

2012/6509, ILUKA RESOURCES LTD/Mining/Balranald/New South Wales/Balranald Mineral Sands Project (16/08/2012)

2012/6408, Iluka Resources Limited/Mining/Eneabba/WA/IPL North Project - Eneabba Mineral Sands Mine, WA (31/05/2012)

2011/5862, Iluka Resources Limited/Exploration (mineral, oil and gas - non-marine)/220km NW of Ceduna, Yellabinna Regional Reserve /South Australia/Atacama program exploration drilling Yellabina Reserve (25/02/2011)

2010/5422, Iluka Resources Limited/Exploration (mineral, oil and gas - non-marine)/Yellabinna Regional Reserve/South Australia/Exploration Drilling Immana Program (30/03/2010)

2009/4929, Iluka Resources Limited/Exploration (mineral, oil and gas - non-marine)/N-Western Yellabinna Regional Reserve/SA/Mineral Sands Drilling (10/06/2009)

2009/4810, Iluka Resources Limited/Mining/Approx 54 km SW of Horsham and 105 km N of Hamilton/Victoria/Bondi East Far North Open Cut Mineral Sands Mine Project, Wimmera Region, Victoria (25/03/2009)

2008/4409, Iluka Resources Limited/Mining/Tutunup Road 17km east of Busselton/WA/Tutunup mineral sands mine (19/08/2008)

2008/4192, Iluka Resources Limited/Mining/Eneabba/WA/Expansion of mineral sand mine (5/05/2008)

2008/3977, ILUKA RESOURCES LTD/Mining/30 km south-west of Horsham, western Victoria/Victoria/Echo Sands Mineral Sands Mining Project (21/01/2008)

2007/3864, Iluka Resources Limited/Mining/EL3742, N-W corner of Yellabinna Reserve, near Lake Ifould /SA/Jacinth and Ambrosia Deposits Project within EL3742 (23/11/2007)

2007/3441, Iluka Resources Limited/Mining/Busselton/Western Australia/Tutunup South Mineral Sands Project (8/05/2007)

2007/3225, ILUKA RESOURCES LIMITED/Mining/Capel/Western Australia/Yoganup 215 mineral sands mine - Mining Lease 70/401 (5/01/2007)

2006/2707, Iluka Resources /Exploration (mineral, oil, gas)/Little Youngs Forest Reserve/VIC/Exploration Drilling for Heavy Mineral Bearing Sand (21/03/2006)

2005/2345, Iluka Resources Ltd/Mining/Waroona/WA/Waroona mineral sand mine (14/10/2005)

2005/2001, ILUKA RESOURCES LIMITED/Mining/Cataby Region/Western Australia/Mineral Sands Mine (16/02/2005)

2004/1636, ILUKA RESOURCES LIMITED/Mining/Ouyen/Victoria/Mineral Sands Mining - Woornack, Rownack, Rainlover, Pirro and Kulwin (12/07/2004)

2003/1119, Iluka Resources Limited/Mining/South West Mineral Field/Shire of Busselton and Capel/WA/Extension of Existing Sand Mining Operations Yoganup West Mining Leases ML70/672, ML70/467, ML70/1107 (7/07/2003)

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
Australian Government 2017, NationalMap (2017) https://nationalmap.gov.au/ accessed 10/11/2017	High. Includes information from published government datasets.	Nil.
Cale, B. (2003), Carnaby's Black Cockatoo (Calyptorhynchus latirostris) Recovery Plan 2002-2012. CALM, Wanneroo.	High. Published by the (then) WA Department of Environment and Conservation.	Nil.
Commonwealth of Australia (2009a). Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Policy Statement 3.10 "Significant Impact Guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, Western Australia.	High. Published by the Department of the Environment and Energy.	Nil.
Commonwealth of Australia (2009b). Background Paper to the EPBC Act Policy Statement 3.10 – Nationally Threatened Species and Ecological Communities. "Significant Impact Guidelines for the vulnerable western ringtail possum (Pseudocheirus occidentalis) in the southern Swan Coastal Plain, Western Australia".	High. Published by the Department of the Environment and Energy.	Nil.
Commonwealth of Australia (2012). EPBC Act Referral guidelines for three threatened	High. Published by the Department of the Environment and Energy.	Nil.

Reference Source	Reliability	Uncertainties
black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris, Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii, Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso.		
Commonwealth of Australia (2013). EPBC Act - Principal Significant Impact Guidelines 1.1, Matters of National Environmental Significance. EPBC Act Policy Statement.	High. Published by the Department of the Environment and Energy.	Nil.
Department of Parks and Wildlife (DPAW) 2017, Western Ringtail Possum (Pseudocheirus occidentalis) Recovery Plan, Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, Western Australia	High. Published by the (then) Department of Parks and Wildlife.	Nil.
Department of Water (DoW) 2007, Surface Hydrology of the Cape-to-Cape Region of Western Australia, Surface Water Hydrology Report No. 21, prepared by the Department of Water, Perth, Western Australia. Accessed 18/06/2018, https://www.water.wa.gov.au/__data/assets/pdf_file/0018/2574/69342.pdf	High. Published by the (then) Department of Water.	Nil.
Department of Water (DoW) 2010, Vasse Wonnerup Wetlands and Geographe Bay water quality improvement plan, prepared by the Department of Water, Perth, Western Australia. Accessed 18/06/2018, https://www.water.wa.gov.au/__data/assets/pdf_file/0017/3329/92284.pdf	High. Published by the (then) Department of Water.	Nil.
Ecoedge 2015, Report of Level 1 Flora and Vegetation survey	High. Survey was undertaken during prime flowering period	Survey has recorded a high percentage of the vascular flora

Reference Source	Reliability	Uncertainties
at the Capel Dry Plant, Capel. Prepared for Iluka Resources Ltd, Perth, Western Australia.	and a high proportion of the plants were identified.	in the survey area.
Endemic Pty Ltd (Endemic) 2013. South Capel Flora and Vegetation Assessment. Prepared by Endemic Pty Ltd for Iluka Resources Ltd, Perth, Western Australia.	High. Survey was undertaken during several occasions across spring and summer seasons: November 2010; June, July, August and October 2011; October and November 2012.	Survey has recorded a high percentage of the vascular flora in the survey area.
Harewood, G. 2010, Terrestrial Fauna Survey (Level 1) of Capel Dry Plant Study Area, Capel. Prepared for Iluka Resources Ltd, Perth, Western Australia.	High. Report prepared by a qualified professional and represents one survey effort (both day and night time survey). Fauna species are indicated as potentially present within this report based on there being suitable (quality and extent) habitat within the study area.	A precautionary approach has been adopted, wherein any fauna species that would possibly occur within the study area as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the Author has been assumed to potentially occur in the study area.
Harewood, G. 2018a, Fauna Assessment, Capel Dry Plant, South Capel Remediation Project. Prepared for Iluka Resources Ltd, Perth, Western Australia.	High. Report prepared by a qualified professional represents survey efforts on two day time and night time surveys. Fauna species are indicated as potentially present within this report based on there being suitable (quality and extent) habitat within the study area.	A precautionary approach has been adopted, wherein any fauna species that would possibly occur within the study area as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the Author has been assumed to potentially occur in the study area.
Harewood, G. 2018b, Fauna Assessment, South Capel, South Capel Remediation Project. Prepared for Iluka Resources Ltd, Perth, Western Australia.	High. Report prepared by a qualified professional represents survey efforts on two day time and night time surveys. Fauna species are indicated as potentially present within this report based on there being suitable (quality and extent) habitat within the study area.	A precautionary approach has been adopted, wherein any fauna species that would possibly occur within the study area as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the Author has been assumed to potentially occur in the study area.

Reference Source	Reliability	Uncertainties
Harewood, G. 2018c, South Capel Remediation Project: Assessment against Significance Guidelines with respect to Matters of National Environmental Significance. Prepared for Iluka Resources Ltd, Perth, Western Australia.	High. Report prepared by a qualified professional represents analysis of survey efforts on two day time and night time surveys.	Nil.
Iluka 2016, South Capel Closure Plan, prepared by Iluka Resources Limited, Perth, Western Australia. TRIM No. 1874200.	High. Document reviewed and approved by the (then) Department of Mines and Petroleum under the WA Mining Act 1978.	Nil.
Iluka 2016, Data Gap Analysis and Conceptual Site Model South Capel Operations – Former Mineral Sands Mine and Processing Plant and Synthetic Rutile Plants Capel Western Australia, prepared by Iluka Resources Limited, Perth, Western Australia.	High. Document reviewed by a third party (Auditor) and submitted under the WA Contaminated Sites Act 2003.	Nil.
Iluka 2017, Southwest Operations Radiation Management Plan 2017, prepared by Iluka Resources Limited, Perth, Western Australia. Doc. No. T18600.	High. Document reviewed and approved by the Department of Mines, Industry Regulation and Safety under the WA Mines Safety and Inspection Regulations 1995.	Nil.
Iluka 2018, Remedial Action Plan, South Capel Remediation Project, Phase 1 Stored Process By-product, Capel Dry Plant, Western Australia, prepared by Iluka Resources Limited, Perth, Western Australia. Doc. No. 0058-1624046663-43.	High. Document reviewed by a third party (Auditor) and submitted under the WA Contaminated Sites Act 2003.	Nil.
Keighery, B.J. 1994, Bushland Plant Survey; A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc.), Western Australia.	High. Published guide extensively used in Western Australia.	Nil.
Land & Water Consulting (LWC) 2018, Conceptual Design Review, South Capel Remediation Project, prepared	High. Report prepared by a qualified professional consultant.	Nil.

Reference Source	Reliability	Uncertainties
by LWC for Sinclair Knight Merz, Perth, Western Australia.		
Sinclair Knight Merz (SKM) 2013. Mandatory Audit Report by Dr Ian Swane Lot 73 on Deposited Plan 35519 (77 Weld Road) Capel Western Australia. Prepared by Sinclair Knight Merz, Perth, Western Australia.	High. Contains the results of an independent review of contaminated site investigation and remediation reports by a Contaminated Sites Auditor accredited by the WA Department of Water and Environmental Regulation.	Nil.
URS 2003. South Capel Groundwater Receptor Preliminary Evaluation. Prepared by URS Australia Pty Ltd for Iluka Resources Ltd, Perth. Western Australia.	High. Report prepared by a qualified professional consultant.	Nil.
Varma, S., Turner, S. and Underschultz, J. (2010), Estimation of submarine groundwater discharge into Geographe Bay, Bunbury, Western Australia. Journal of Geochemical Exploration, Vol. 106, Is. 1-3, pp. 197-210.	High. Published article in the Journal of Geochemical Exploration.	Nil.
Wave International (Wave) 2018. South Capel Remediation Project, HRCF Extension Engineering Design. Prepared by Waves for Iluka Resources Ltd, Perth. Western Australia.	High. Report prepared by a qualified professional consultant.	Nil.

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

As this is a remediation project required under the WA *Contaminated Sites Act 2003*, there is no feasible long-term alternative for ameliorating groundwater quality, and for eventual closure and relinquishment of the site.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Manager Rehabilitation & Closu

9.2.2 First Name

Tim

9.2.3 Last Name

Bartholomew

9.2.4 E-mail

Tim.Bartholomew@iluka.com

9.2.5 Postal Address

140 Saint Georges Terrace
Perth WA 6000
Australia

9.2.6 ABN/ACN

ACN

008675018 - ILUKA RESOURCES LIMITED

9.2.7 Organisation Telephone

+61 8 9360 4700

9.2.8 Organisation E-mail

office.services@iluka.com

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:…… Date: ……

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, __Tim Bartholomew_____, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..  …… Date: …18/07/2018……

I, ___Tim Bartholomew_____, the person proposing the action, consent to the designation of _____ as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..  ……. Date: ...18/07/2018……

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Manager Rehabilitation & Closure

9.5.2 First Name

Tim

9.5.3 Last Name

Bartholomew

9.5.4 E-mail

Tim.Bartholomew@iluka.com

9.5.5 Postal Address

140 Saint Georges Terrace
Perth WA 6000
Australia

9.5.6 ABN/ACN

ACN

008675018 - ILUKA RESOURCES LIMITED

9.5.7 Organisation Telephone

+61 8 9360 4700

9.5.8 Organisation E-mail

office.services@iluka.com

Proposed designated proponent - Declaration

I, ___Tim Bartholomew_____, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature:  …… Date: ……18/07/2018……

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Manager Environmental Regulations

9.8.2 First Name

Angela

9.8.3 Last Name

Bishop

9.8.4 E-mail

Angela.Bishop@iluka.com

9.8.5 Postal Address

140 Saint Georges Terrace
Perth WA 6000
Australia

9.8.6 ABN/ACN

ACN

008675018 - ILUKA RESOURCES LIMITED

9.8.7 Organisation Telephone

+61 8 9360 4700

9.8.8 Organisation E-mail

office.services@iluka.com

Referring Party - Declaration

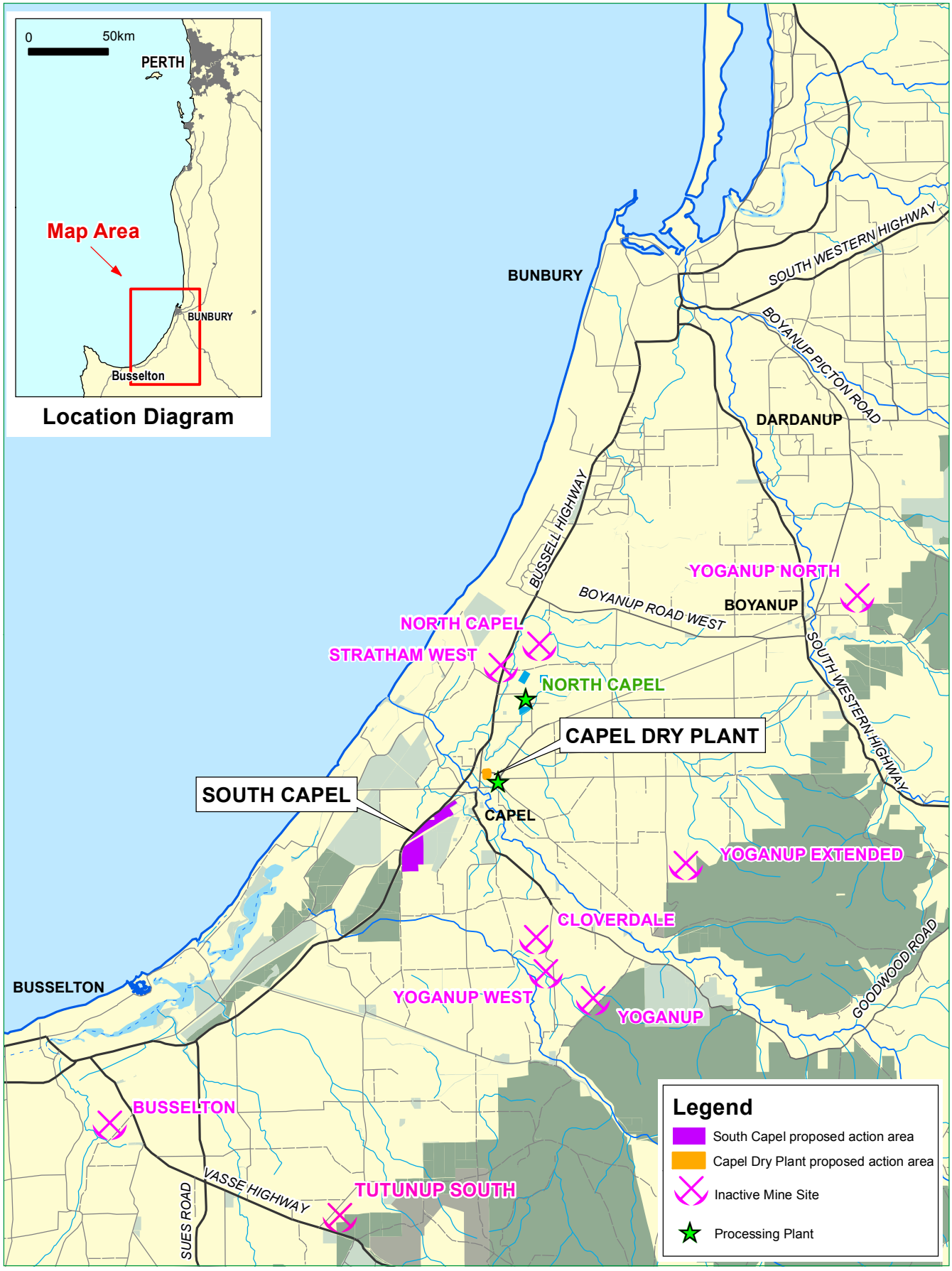
I, ___Angela Bishop_____, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature:..  …… Date: …18/07/2018……

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. figure_1.pdf
2. figure_2.pdf
3. figure_3.pdf
4. figure_4.pdf
5. figure_5.pdf
6. figure_6.pdf
7. figure_7.pdf
8. figure_8.pdf
9. figure_9.pdf
10. figure_10.pdf
11. flora_and_vegetation_survey_capel_dry_plant_capel_part1.pdf
12. flora_and_vegetation_survey_capel_dry_plant_capel_part2.pdf
13. iluka_cdp_fauna_assessment_report_v4a.pdf
14. iluka_sc_fauna_assessment_report_v4a.pdf
15. scrp_attachment_1_rev_0.pdf
16. south_capel_flora_2013_part_1.pdf
17. south_capel_flora_2013_part_2.pdf
18. south_capel_flora_2013_part_3.pdf



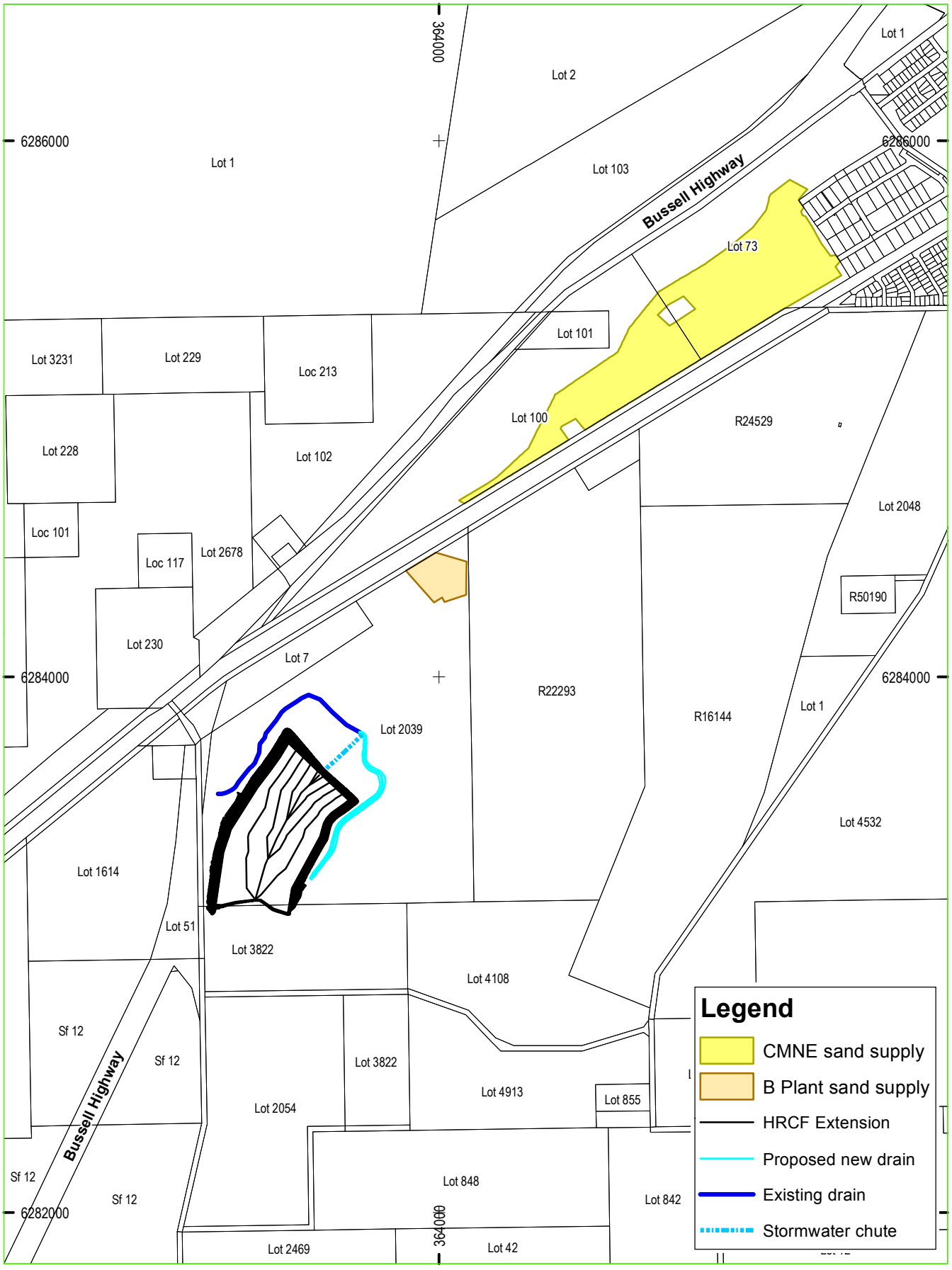
SOUTH CAPEL REMEDIATION PROJECT

REGIONAL LOCATION

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:250,000 (A4) DATE: 5 July 2018 DWG No: 249549 ver.00

FIGURE: 1



SOUTH CAPEL REMEDIATION PROJECT

SOUTH CAPEL MINING AND PROCESSING SITE, PROPOSED ACTIVITIES

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:20,000 (A4) DATE: 5 July 2018 DWG No: 249557 ver.00

FIGURE: 2

N

Aerial Photography: 2018

0 100 200 m

MGA Coordinates, GDA94

SOUTH CAPEL REMEDIATION PROJECT

SOUTH CAPEL MINING AND PROCESSING SITE

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:7,500 (A4) DATE: 5 July 2018 DWG No: 249550 ver.00

FIGURE: 3

N

Aerial Photography: 2018

0 25 50 m

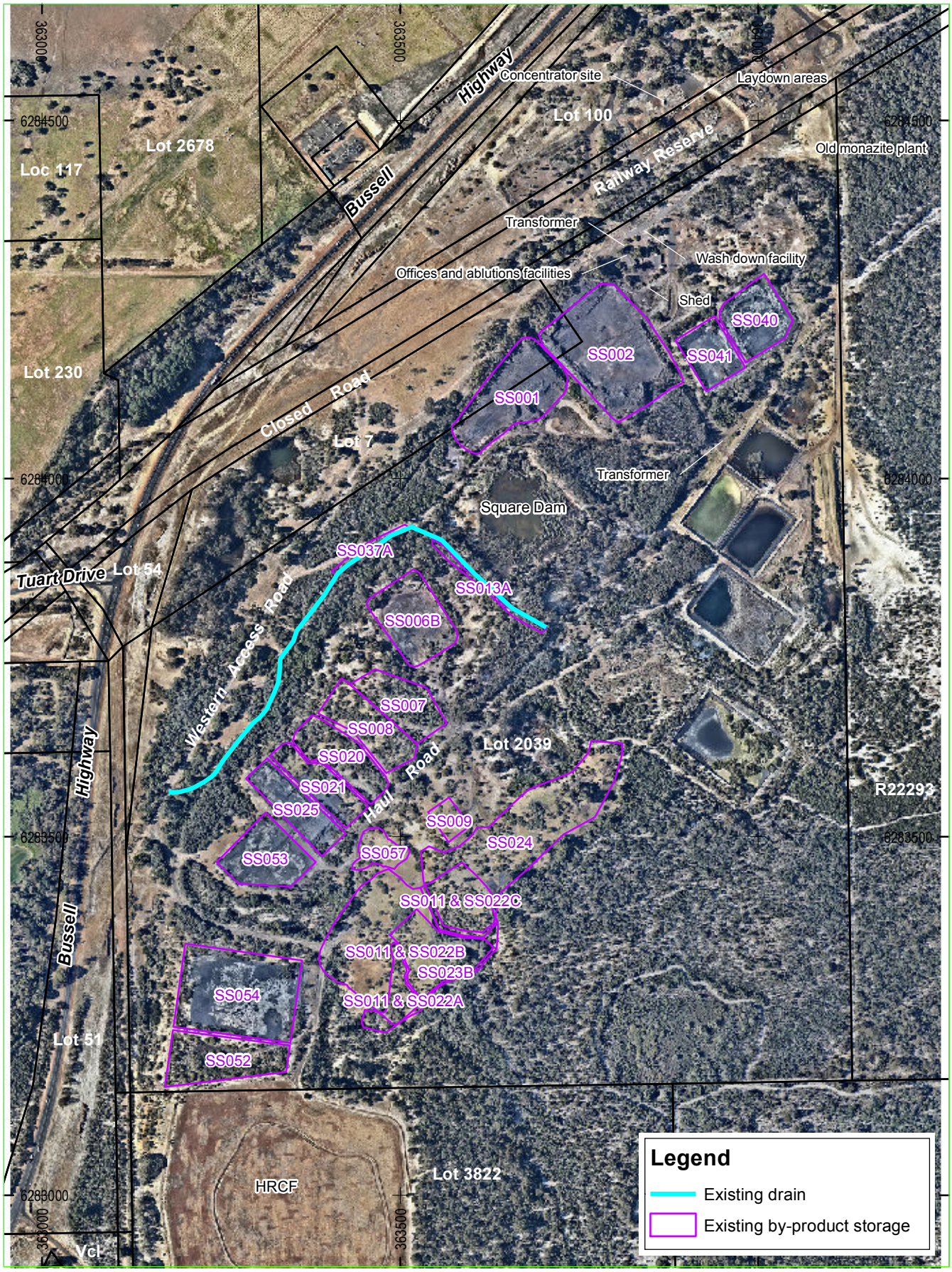
CAPEL DRY PLANT

CLEARING PERMIT AREA

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:1,500 (A4) DATE: 5 July 2018 DWG No: 249552 ver.00

FIGURE: 4



N

Aerial Photo 2018

0 100 200 m

MGA Coordinates, GDA94

SOUTH CAPEL REMEDIATION PROJECT

SOUTH CAPEL MINING AND PROCESSING SITE, CURRENT SITE LAYOUT

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:7,500 (A4) DATE: 5 July 2018 DWG No: 249556 ver.00

FIGURE: 5

N

Aerial photo: 2010

0 200 400 m

MGA Coordinates, GDA94

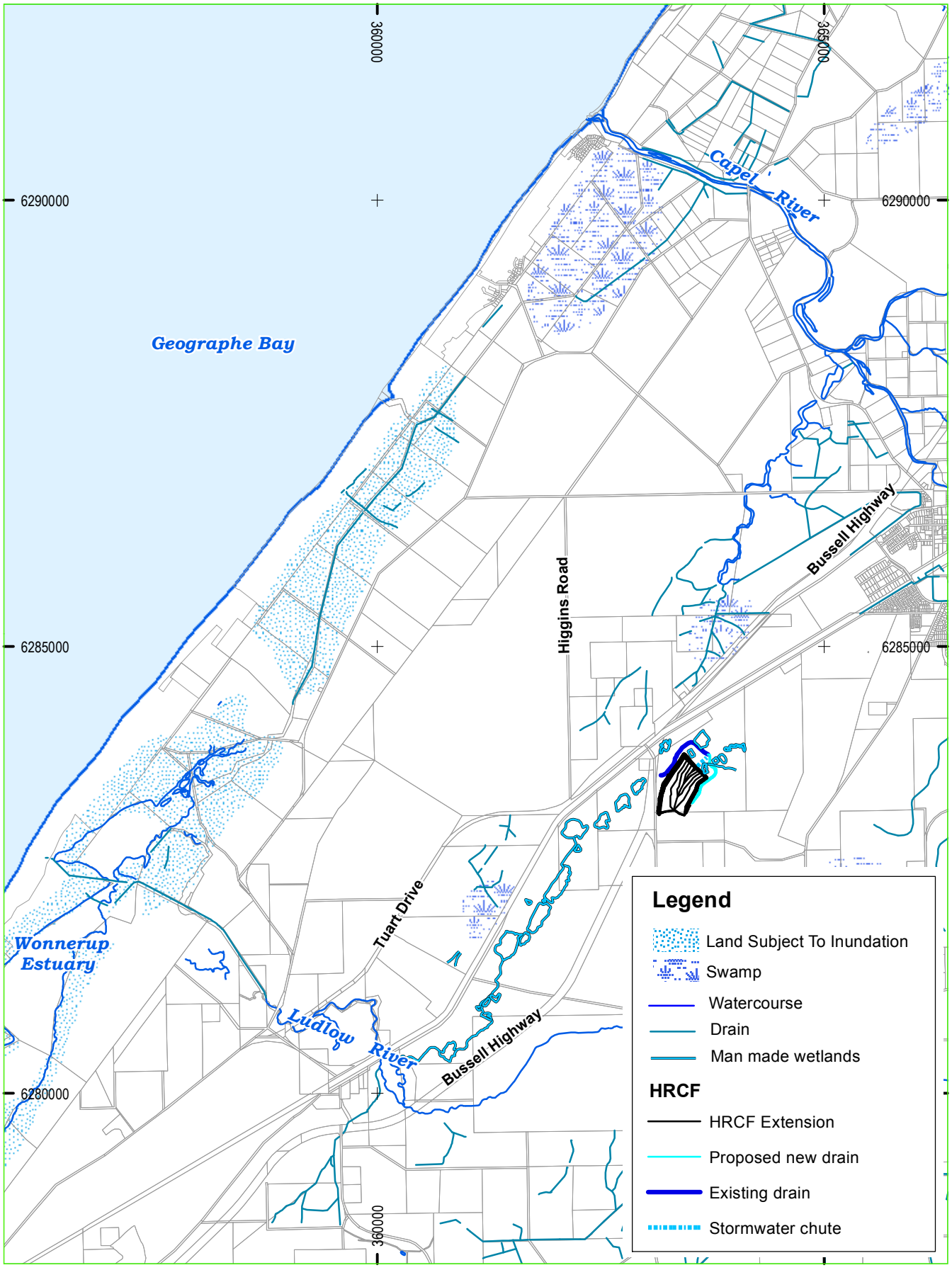
SOUTH CAPEL REMEDIATION PROJECT

CAPEL MINE NORTH EXTENSION SAND SUPPLY AREA

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:12,500 (A4) DATE: 5 July 2018 DWG No: 249551 ver.00

FIGURE: 6



N

0 1,000 2,000 m

MGA Coordinates, GDA94

SOUTH CAPEL REMEDIATION PROJECT

SOUTH CAPEL SITE SURFACE WATER

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:60,000 (A4) DATE: 5 July 2018 DWG No: 249558 ver.00

FIGURE: 7

N

Aerial Photo. 2018

0 25 50 m

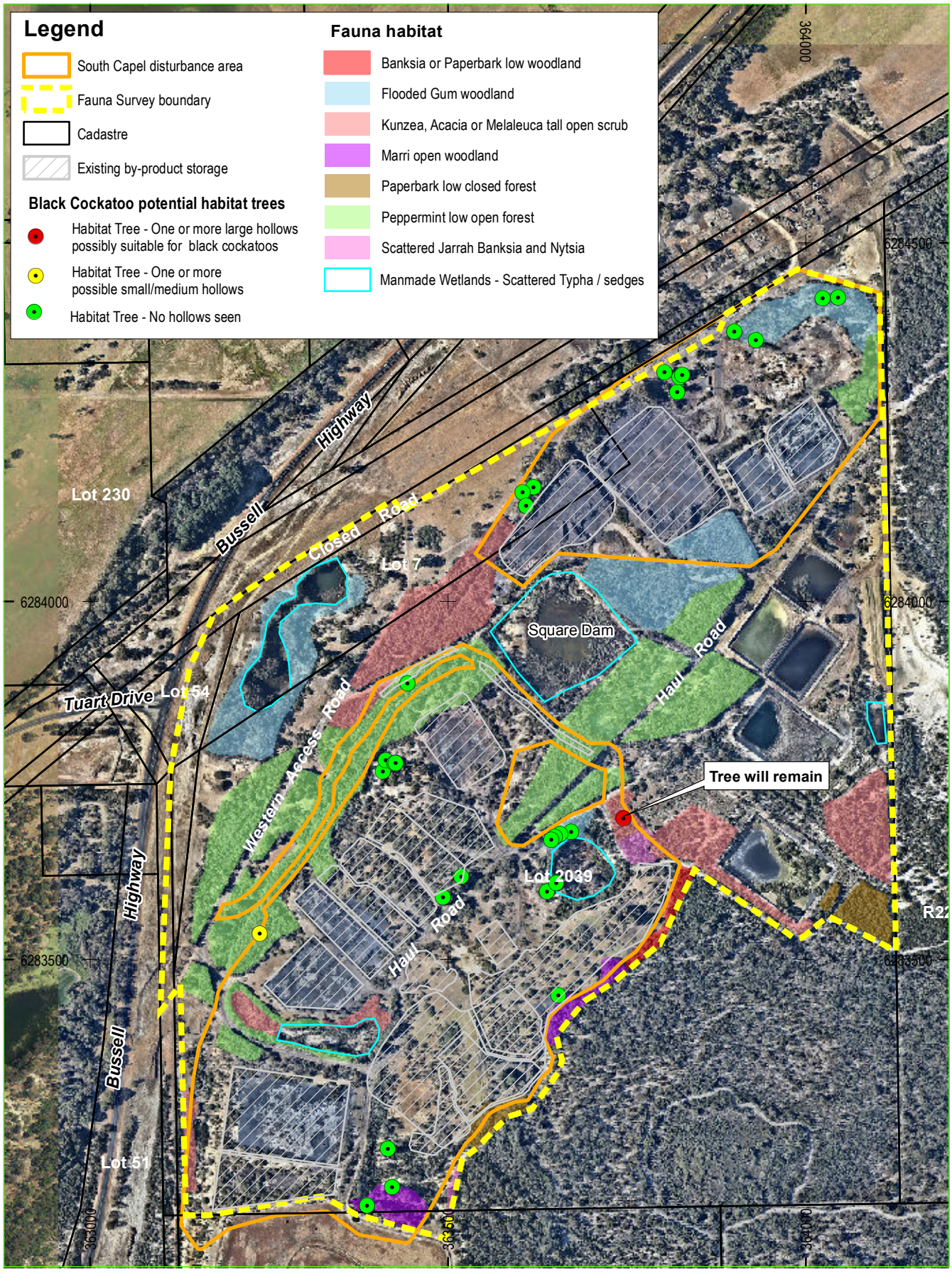
SOUTH CAPEL REMEDIATION PROJECT

CAPEL DRY PLANT FAUNA HABITAT

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:2,000 (A4) DATE: 5 July 2018 DWG No: 249554 ver.01

FIGURE: 8



N

Aerial Photography: 2018

0 100 200 m

MGA Coordinates, GDA94

SOUTH CAPEL REMEDIATION PROJECT

SOUTH CAPEL MINING AND PROCESSING SITE FAUNA HABITAT

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:7,500 (A4) DATE: 5 July 2018 DWG No: 249553 ver.01

FIGURE: 9

N

0 2.5 5 km

MGA Coordinates, GDA94

SOUTH CAPEL REMEDIATION PROJECT

REGIONAL FAUNA HABITAT

ILUKA

ORIG: N.Zago DRAWN: D.G.S. SCALE: 1:175,000 (A4) DATE: 5 July 2018 DWG No: 249555 ver.00

FIGURE: 10