FORRESTANIA NICKEL OPERATION
Spotted Quoll – Cosmic Boy Haul Road

EPBC APPROVAL 2011/6003
Compliance Assessment Report

Prepared by: IGO Forrestania Ltd

Prepared for: Department of Climate Change. Energy, the Environment and Water

Date: 25 July 2023

1. EXECUTIVE SUMMARY

This Compliance Assessment Report (CAR) outlines the status of compliance of the IGO Forrestania Limited (IGOF) owned Spotted Quoll – Cosmic Boy Haul Road project, (the action), with the project implementation conditions set by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities or DSEWPC, (which is now the Department of Climate Change. Energy, the Environment and Water), in their Environment Protection and Biodiversity Conservation Act 1999 (EPBC) assessment approval letter dated the 10th of February 2012 (EPBC 2011/6003).

For the reporting period (i.e., 25th April 2022 – 24th April 2023) there have been no known non-compliances with the conditions of approval EPBC 2011/6003.

An Audit Table has been developed which summarises compliance with the conditions of EPBC 2011/6003 (Refer Section 4 of this report).

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2. INTRODUCTION

The Forrestania Nickel Operation (FNO) is situated approximately 160 kilometres south of Southern Cross and 80 kilometres east of Hyden in the Shire of Kondinin. The FNO is owned and operated by IGO Forrestania Limited (IGOF) in an area with a long history of mining and exploration activity. Figure 1 shows the location of the FNO within Western Australia.

IGOF currently operates the Flying Fox underground nickel mine, Spotted Quoll underground nickel mine, Cosmic Boy accommodation camp and the Cosmic Boy nickel concentrator. The previously approved Diggers South project currently in care and maintenance. Exploration activities continue throughout the Forrestania area on IGOF mining tenements.

The Spotted Quoll - Cosmic Boy Haul Road proposal (the action) was assessed by the Department of Sustainability, Environment, Water, Population and Communities or DSEWPC, (which is now the Department of Climate Change. Energy, the Environment and Water), as being a controlled action (EPBC 2011/6003) on the 19th of July 2011. This was due to the determination by DSEWPC that the action was likely to have a significant impact on "Listed Threatened Species and Communities".

On the 10th of February 2012, DSEWPC approved the action subject to compliance with ten (10) implementation conditions.

On the 8th March 2012, the action was signed off (Reg# 30654) by the Environmental Division of the Western Australian Department of Mines and Petroleum or DMP (now the Department of Mines, Industry Regulation and Safety (DMIRS).

Ground disturbance activities associated with the implementation of the action commenced on the 25th of April 2012.

Figure 2 shows the general layout of the Spotted Quoll - Cosmic Boy Haul Road project.

3. PURPOSE AND SCOPE

EPBC 2011/6003 contains implementation conditions endorsed by the A/g Assistant Secretary Environmental Assessment Branch DSEWPC, by which the project can be implemented. Condition 7 of EPBC 2011/6003 provides details of Compliance Reporting requirements.

Condition 7 states: Within three months of every 12-month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any plan(s) as specified in the conditions. These reports must remain on the website for at least 5 years. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.

4. COMPLIANCE WITH EPBC 2011/6003

The Compliance Assessment Report (CAR) must cover the previous 12 months from the 24th April and be submitted each year by the 25th July.

EPBC 2011/6003 lists ten (10) implementation conditions for the action. These conditions have been compared with the actions undertaken during project implementation so that a measure of compliance can be made.

4.1. CONDITION ONE

Statement	Compliance for the reporting period
Condition 1 of EPBC 2011/6003 relates to the clearing associated with the action and states: The person taking the action must not clear more than 40.74 hectares (ha) of native vegetation within Mining Leases 77/583, 77/584, 77/586, 77/587, 77588, 77/589, 77/399, Forrestania, WA (Attachment A).	**In compliance** Justification Total clearing associated with the construction of the Spotted Quoll to Cosmic Boy Haul Road to date is approximately 37.78 Ha which is within the total clearing allowance of 40.74 Ha. Disturbance calculations are based on aerial photography analysis and internal ground disturbance information (GIS data).

4.2. CONDITION TWO

Statement	Compliance for the reporting period
a) Prior to the commencement of construction, the person taking the action must enter into an agreement with a recognised research body to fund a research project that will aid in the future persistence of Carnaby's Black-Cockatoo. b) Prior to the commencement of the research project, the person taking the action must submit to the Department for endorsement, a document detailing the full scope of the research project. The document must include the rationale for the project, expected timeframes for completion and aims of the project. c) The person taking the action must provide the sum of two hundred thousand dollars ($200,000) to the recognised research body for the research project, in annual payments of forty thousand dollars ($40,000) per	**In compliance** Justification a) Western Areas entered into an agreement (the agreement) with the Western Australian Museum (the Museum, which is a recognised research body) on the 2nd February 2012 for a 5 year sponsorship of a Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) research program. Commencement of construction occurred on the 25th May 2012 which is close to four months after the agreement was signed. **Status: Complete**. b) A document outlining the scope of the Carnaby's Cockatoo research project was included with a copy of the Carnaby's Black-Cockatoo Management Plan (CBCMP) which was submitted in the mail to the DSEWPC

year. These payments must be made no later than 31 December of each year after the agreement has been entered into. The person taking the action must provide written evidence to the Department that the agreement has been entered into prior to the commencement of construction.	on the 28th February 2012. Endorsement for the CBCMP was provided by DSEWPC on the 13th April 2012. The research project did not commence until July 2012 when the first sponsorship payment was due. **Status: Complete**. c) The agreement requires Western Areas to donate two hundred thousand dollars ($200,000) to the Museum in forty thousand dollar ($40,000) annual payments between 2012 and 2016. The payments for 2012, 2013, 2014, 2015 and 2016 have been paid to the museum with the 2016 payment being the last payment and being made in August 2016. A document detailing the agreement between Western Areas and the Museum was supplied with the Carnaby's Black-Cockatoo Management Plan (CBCMP) which was submitted by mail to the DSEWPC on the 28th of February 2012. Endorsement for the CBCMP was provided by DSEWPC on the 13th April 2012. The research project commenced in July 2012 when the first sponsorship payment was paid. **Status: Complete**.

4.3. CONDITION THREE

Statement	Compliance for the reporting period
Within six (6) months of completion of the research project outlined in condition 2, the person taking the action must provide the Department with a copy of the final research report in PDF format.	**In compliance** The Carnaby's Cockatoo Research Project has been completed and a copy of the final research report was provided to DoE on 27/06/2018. **Status: Complete**.

4.4. CONDITION FOUR

Statement	Compliance for the reporting period
To mitigate potential impacts on the Carnaby's Black Cockatoo, the person taking the action must develop a Carnaby's Black-Cockatoo Management Plan. The Carnaby's Black-Cockatoo Management Plan must include: • Vegetation clearing protocols, which must ensure that no more than 40.74 ha of remnant native vegetation on site is removed; • Vegetation clearing protocols should construction take place during the breeding season for the Carnaby's Black-Cockatoo; • Timeframes for staging the clearing and construction works; • Details of revegetation/rehabilitation of the haul road to be undertaken upon decommissioning of the mine; • Planting protocols for rehabilitating the haul road, including procedures for maintenance for a period of two years; • Details of the replanting schedule should the survival rate of revegetation plantings be less than 80% after two years; • Measures to be implemented to manage feral animals; • Measures to be implemented to manage the risk of fire in the area; • Roles and responsibilities of contractors, staff and the person taking the action prior to, during and post construction; • Program for reporting and monitoring; and	**In compliance** A CBCMP was submitted to DSEWPC on the 5th April 2012 and was approved on the 13th April 2012 which is prior to commencement of construction which occurred on the 25th April 2012. A compliance assessment summary report has been completed regarding the implementation of the CBCMP for the reporting period and this has been included as Appendix 1. There were no non-compliances with the CBCMP for the reporting period.

• Timeframes for the implementation and management of the above measures. The Carnaby's Black Cockatoo Management Plan must be submitted to the department for approval prior to construction commencing. If the department approves the plan, the approved plan must be implemented.	

4.5. CONDITION FIVE

Statement	Compliance for the reporting period
Unless otherwise agreed to in writing by the Minister, the person taking the action must publish the management plan referred to in these conditions of approval on their website and make the plan publicly available. The Management Plan must be published on the website within one (1) month of the Management Plan being approved and must remain there for the length of the approval.	**In compliance** The CBCMP was published on the company website within one month of it being approved in 2012. A copy of the CBCMP remained on the WSA website and is now publicly available on the IGO website here - Caring | IGO Limited - Making A Difference

4.6. CONDITION SIX

Statement	Compliance for the reporting period
The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	**In compliance** Records are kept in hard copy files and electronically on the IGOF servers for all activities related to or relevant to the approval. Records are available to the DSEWPC (DoE) or an independent auditor on request.

4.7. CONDITION SEVEN

Statement	Compliance for the reporting period
Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any plan(s) as specified in the conditions. These reports must remain on the website for at least 5 years. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	**In compliance** The CAR for the reporting period was due to be completed and published on the IGOF website on or before the 24th July 2023 which occurred as planned. Caring | IGO Limited - Making A Difference

4.8. CONDITION EIGHT

Statement	Compliance for the reporting period
If the person taking the action wishes to carry out any activity otherwise than in accordance with the plan(s) as specified in the Conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of the plan(s). The varied activity shall not commence until the Minister has approved the varied plan(s) in writing. The Minister will not approve a varied plan(s) unless the revised plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised plan(s), that plan(s) must be implemented in place of the plan(s) originally approved.	There has been no requirement to carry out any activity otherwise that in accordance with the CBCMP for the reporting period. Condition 8 is not applicable for the reporting period.

CONDITION NINE

Statement	Compliance for the reporting period
If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and communities to do so, the Minister may request that the person taking the action make specified revisions to the plan(s) specified in the Conditions and submit the revised plan(s) for the Minister's written approval. The person taking the action must comply with any such request. The revised approved plan(s) must be implemented. Unless the Minister has approved the revised plan(s), then the person taking the action must continue to implement the plan(s) originally approved, as specified in the conditions.	There have been no requests from the Minister to revise the CBCMP during the reporting period. Condition 9 is not applicable for the reporting period.

4.9. CONDITION TEN

Statement	Compliance for the reporting period
If, at any time after five years from the date of this approval, the person taking the action has not substantially commenced the action, then the person taking the action must not substantially commence the action without the written agreement of the Minister.	**In compliance** Justification: The action was substantially commenced on the 25th April 2012. **Status: Complete**.

5. AUDIT TABLE SUMMARY

Table 1 summarises compliance with the EPBC 2011/6003 implementation conditions for the reporting period.

Table 1: Summary Compliance Statement for EPBC 2011/6003

Condition Number	Compliance Summary for Period 25th April 2022 to 24th April 2023
1	Total clearing associated with the construction of the Spotted Quoll to Cosmic Boy Haul Road to date is approximately 37.78 Ha which is within the total clearing allowance of 40.74 Ha. Compliance has been met for Condition 1 for the reporting period.
2	Part A) Western Areas entered an agreement with the Western Australian Museum (recognised research body) on the 2nd February 2012 for a 5-year sponsorship of a Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) research program. Part B) A document outlining the scope of the Carnaby's Cockatoo research project was included with a copy of the Carnaby's Black-Cockatoo Management Plan (CBCMP) which was submitted to the DSEWPC on the 28th February 2012. Endorsement for the CBCMP was provided by DSEWPC on the 13th April 2012. Part C) The agreement requires Western Areas to donate two hundred thousand dollars ($200,000) to the Museum in forty thousand dollar ($40,000) annual payments between 2012 and 2016. These payments have been made to the museum and records kept by Western Areas. Compliance has been met for Condition 2 for the reporting period.
3	The Carnaby's Cockatoo Research Project has been completed and a copy of the final research report was provided to DoE on 27/06/2018.
4	A CBCMP was submitted to DSEWPC on the 5th April 2012 and was approved on the 13th April 2012 prior to commencement of construction (25th April 2012). A compliance assessment summary report (Appendix 1) has been completed regarding the implementation of the CBCMP. There were no non-compliances with the CBCMP for the reporting period. Compliance has been met for Condition 4 for the reporting period.
5	The CBCMP was published on the company website within one month of it being approved. A copy of the CBCMP remains on the WSA website where it was publicly available, between 21 June 2022 to XX July 2023. This was as a result of slip lapse in the asset transfer between the new owners of Western Areas Ltd. IGOF is now in compliance.

Condition Number	Compliance Summary for Period 25th April 2022 to 24th April 2023
6	Records have been kept by Western Areas for all activities related or relevant to the approval. Records are available to DSEWPC (DoE) or an independent auditor on request. Compliance has been met for Condition 6 for the reporting period.
7	The CAR for the reporting period was due to be completed and published on the Western Areas website on or before the 24th July 2022 which occurred as planned. Compliance has been met for Condition 7 for the reporting period.
8	Condition 8 is not applicable for the reporting period.
9	Condition 9 is not applicable for the reporting period.
10	The action was substantially commenced on the 25th April 2012. Compliance with Condition 10 has been met and should be considered complete.

6. CONCLUSION

This CAR outlines the current status of compliance with the implementation conditions set out in EPBC 2011/6003 for the Western Areas Spotted Quoll - Cosmic Boy Haul Road proposal.

For the reporting period (i.e. 25th April 2022 – 24th April 2023) there were no known non-compliances with the conditions of EPBC 2011/6003.

If there are any queries regarding this compliance document, please do not hesitate to contact the undersigned.

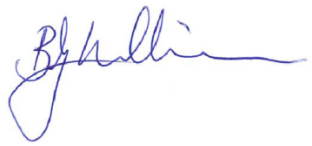

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Figure 1: Location of Forrestania Nickel Operation in Western Australia

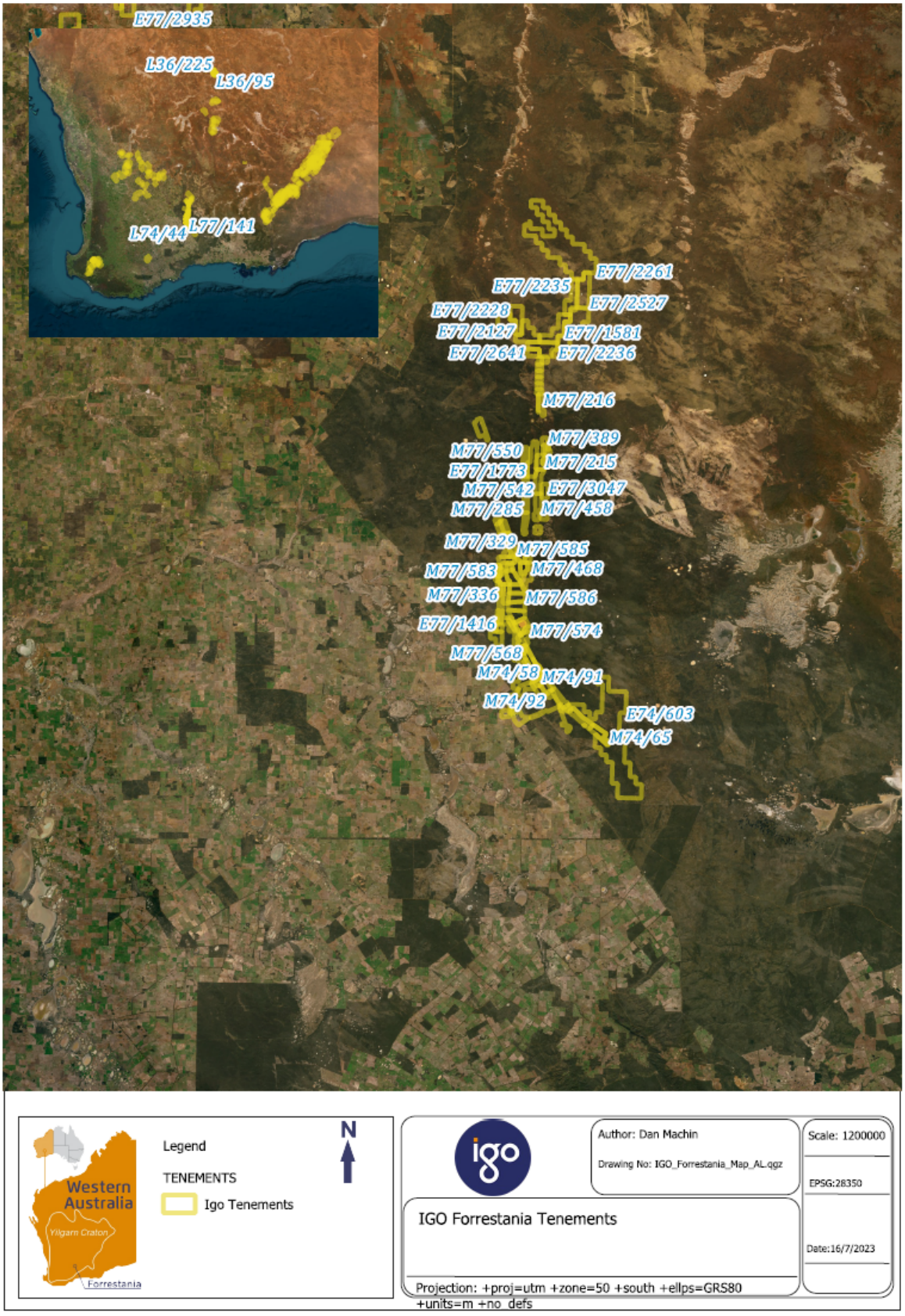
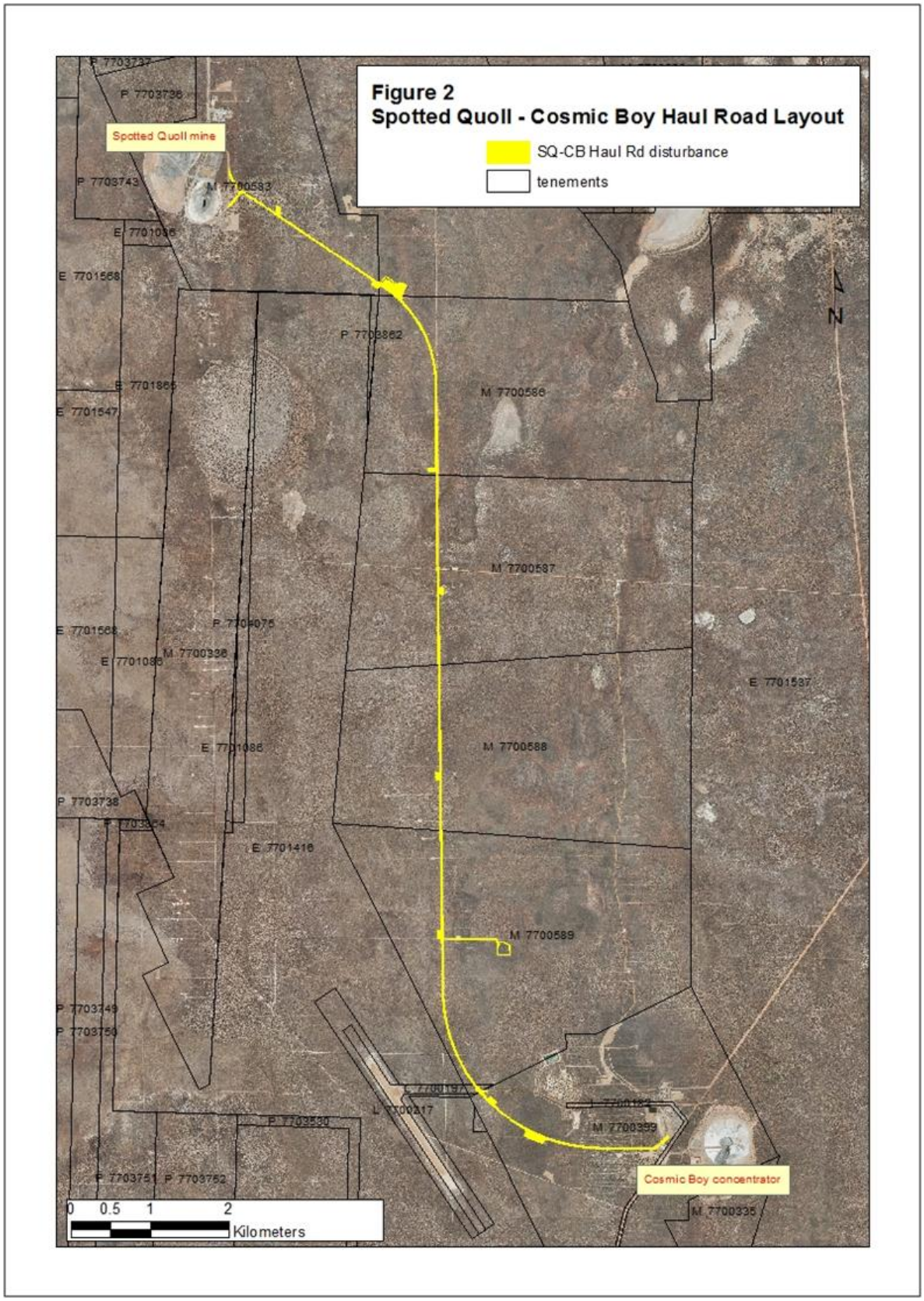


Figure 2: Spotted Quoll - Cosmic Boy Haul Road Proposal General Site Layout Plan



7. APPENDICES

7.1. CARNABYS BLACK-COCKATOO MANAGEMENT PLAN

The IGOF Carnaby's Black-Cockatoo Management Plan was implemented during previous and current reporting periods and this appendix has been included to demonstrate compliance with Condition 4 of EPBC 2011/6003.

Condition 4 of EPBC2011/6003 relates to the threatened fauna species *Calyptorhynchus latirostris* (Carnaby's Black-Cockatoo) and states:

To mitigate potential impacts on the Carnaby's Black Cockatoo, the person taking the action must develop a Carnaby's Black Cockatoo Management Plan. The Carnaby's Black-Cockatoo Management Plan must include:

- *Vegetation clearing protocols, which must ensure that no more than 40.74 ha of remnant native vegetation on site is removed;*
- *Vegetation clearing protocols should construction take place during the breeding season for the Carnaby's Black Cockatoo;*
- *Timeframes for staging the clearing and construction works;*
- *Details of revegetation/rehabilitation of the haul road to be undertaken upon decommissioning of the mine;*
- *Planting protocols for rehabilitating the haul road, including procedures for maintenance for a period of two years;*
- *Details of the replanting schedule should the survival rate of revegetation plantings be less than 80% after two years;*
- *Measures to be implemented to manage feral animals;*
- *Measures to be implemented to manage the risk of fire in the area;*
- *Roles and responsibilities of contractors, staff and the person taking the action prior to, during and post construction;*
- *Program for reporting and monitoring; and*
- *Timeframes for the implementation and management of the above measures.*

The Carnaby's Black Cockatoo Management Plan must be submitted to the department for approval prior to construction commencing. If the department approves the plan, the approved plan must be implemented.

Compliance in relation to each objective of the approved Carnaby's Black-Cockatoo Management Plan (CBCMP) is stated within Table 2.

Table 2: Carnaby's Black-Cockatoo Management Plan Compliance

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
Avoid and minimise impacts on Carnaby's Black-Cockatoo habitat	Disturbance will be in accordance with Forrestania Nickel Project Ground Disturbance Request Procedure.	During clearance	Head of Environment and Climate	All clearing undertaken during the project was approved prior to disturbance through the internal Ground Disturbance Procedure. Copies are available on file.	Yes
	Ensuring no more than 40.74 ha of remnant native vegetation is removed in the project area.	During clearance	Onsite Environmental Department	An analysis of the disturbance footprint for the Haul Road from aerial photography shows that only 37.78 Ha was disturbed for establishment of the haul road. No additional development has been undertaken.	Yes
	Prior to clearing commencing, the haul road will be walked by the company's Environmental staff and areas to be cleared will be well-defined to avoid over clearing.	Prior to clearing	Onsite Environmental Department	The clearing footprint was flagged by survey and checked by environmental personnel both prior to and following clearing.	Yes
	All clearing will be supervised by the Environmental staff.	During clearing	Onsite Environmental Department	All clearing activities were checked daily by environmental personnel.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	During Clearing operations daily 'toolbox' meetings will be held to discuss proposed clearing during the day.	During clearing	Onsite Project Manager	Toolbox and/or prestart meetings held daily prior to commencement of the day's activities. Records kept in the daily reports for the project which are kept on file.	Yes
	WSA environmental staff will monitor and record vegetation cleared weekly.	During clearing	Onsite Project Manager	Environmental personnel inspected the haul road site regularly and vegetation disturbance activities were reported in the daily reports for the project.	Yes
	Restricting traffic to established roads and parking areas so as not to disturb vegetation.	Ongoing	Onsite Project Manager	Dedicated park-up areas were established for construction of the project.	Yes
	Induction of employees to ensure disturbance is confined to areas identified clearly in the field.	Ongoing	Onsite Environmental Adviser	All staff and contractors undertake both a general site induction and site-specific haul road induction prior to commencing work on the project. Induction records kept on file.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	Areas of vegetation disturbed temporarily during the construction of the haul road will be rehabilitated as soon after construction as practicable.	Ongoing	Onsite Environmental Adviser	All temporary borrow pits and turn around points not required for ongoing project uses have been rehabilitated.	Yes
	All large trees and stags with hollows will be avoided where possible.	During clearance	Construction personnel	All large trees that could be avoided were flagged and their locations reported to construction personnel. Records kept in daily reports.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	If clearing is to occur during the breeding season, the following actions will be implemented. Each potential breeding hollow within 400m will be assessed by a suitably qualified environmental professional prior to clearing. WSA environmental staff will create exclusion zones with yellow and black caution flagging tap around any active breeding hollows and prohibit all staff and contractors from entering this area without permission of the WSA environmental staff. Clearing for the project during Carnaby's Black-Cockatoo breeding season will be restricted to those areas of the haul road outside a 400m zone from any potential breeding hollow.	Prior to and during clearing	Onsite Environmental Adviser	All clearing for the project was undertaken between the 25th April 2012 and approximately the 15th May 2012 which is outside the breeding season for Carnaby's Cockatoo.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	All staff and contractors will attend a compulsory environmental induction which will include information on Carnaby's Black-Cockatoo, in particular photos and details on breeding hollows and foraging habitat. Information about the known locations of the species, species management and incidents will be provided to staff and contractors.	Prior to clearing	Onsite Environmental Adviser	All staff and contractors undertake both a general site induction and site-specific haul road induction prior to commencing work on the project. These inductions include a component relating to rare fauna management onsite including Carnaby's Black-Cockatoo. Induction records are kept on file.	Yes
	A copy of this management plan to be distributed to staff and contractors working on the construction of the proposed haul road.	Prior to clearing	Head of Environment and Climate	A copy of the CBCMP was made available to the project manager and the main construction contractor during construction operations.	Yes
Fire Management	Firebreaks will be constructed and maintained in the project area in accordance with legislative requirements.	Ongoing	Forrestania General Manager	Firebreaks have been established around all buildings in line with legislative requirements. A network of roads has been established as a part of project implementation and these act as firebreaks and as access in the event of a fire.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	Undertake annual fuel-loading assessments on WSA tenements and consider appropriate management options in consultation with DEC and DFES.	Annually	Onsite Environmental Adviser	A fuel load assessment was undertaken for the entire FNO site in December 2020. Results are recorded in the site environmental database. Regular consultation is undertaken with DBCA and DFES with regards to fire management at the Forrestania Nickel Operation.	Yes
	Conduct a baseline fuel loading assessment prior to the commencement of the project to determine the background levels of potential fire risks.	Prior to clearing	Onsite Environmental Adviser	A fuel load assessment was undertaken along the internal haul route on the 18/11/2011 prior to commencement of construction.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	As required by state mining legislation, the Forrestania Nickel Operation will maintain an Emergency Response Team trained in Emergency Response which includes the outbreak of fire both on the surface and underground. This team will be deployed where required in the event of an outbreak of fire.	Ongoing	Forrestania General Manager	The Emergency Response Team has been established in line with legislative requirements and is active. Training in bushfire and mine site emergency response is ongoing.	Yes
	Vehicles will be fitted with two-way radios that can also be used in an emergency situation.	Ongoing	Onsite Project Manager	All vehicles used onsite contain either a UHF or VHF radio or both so that communications can be established in an emergency.	Yes
	Public bushfire danger warnings from the Bureau of Meteorology will be used to predict the level of bushfire risk within the Project Area.	Ongoing	Onsite Project Manager	Notifications from the Shire of Kondinin and from DFES are received onsite to alert of Total Fire Ban days and when there are Harvest and Total Vehicle Movement Bans in place.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	Fire management monitoring requirements will be reviewed after the initial 12 months of operation and adjusted if necessary.	Annually	Head of Environment and Climate	A review of the site Fire Management Plan was undertaken in April 2021.	Yes
	All WSA employees and contractors will be required to report any potential fire risks to the site manager via their supervisor.	Ongoing	All site employees and contractors	Site hazard and incident reporting procedures are in place to allow for hazards and incidents to be reported and managed accordingly. Personnel are regularly encouraged to report all hazards and incidents during site safety meetings.	Yes
	All records of fire management monitoring kept in accordance with this plan will be summarised in the Annual Environmental Review, which will be submitted to the DMP and DEC.	Ongoing	Head of Environment and Climate	Fire management monitoring records will be included in the Annual Environmental Review which is due for submission to the relevant agencies by September 30 2022.	Yes

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
Feral Animal Control	Annual 1080 baiting will occur at strategic locations in the Forrestania region.	Annually	Head of Environment and Climate	1080 baiting is undertaken as required at the FNO by the Eastern Wheatbelt Declared Species Group in accordance with state baiting legislation. The latest baiting occurred in October 2022.	Yes
	Undertake annual trapping for feral cats.	Annually	Onsite Environmental Adviser	Trapping for cats is undertaken annually by staff. The latest trapping campaign occurred in July-Sept 2022; and May to June 2023.	Yes.
	Food waste will be disposed into local rubbish tips near Cosmic Boy and Spotted Quoll mining areas.	Ongoing	All site employees and contractors	All food waste is disposed in local rubbish tips or in bins that are emptied weekly with waste transported to the local Shire waste transfer station or Perth for re-cycling into compost.	Yes.
	Local rubbish tips will be fenced and compacted with soil regularly to limit the availability of edible waste to both feral and native animals.	Ongoing	Forrestania General Manager	Local rubbish tips are managed in accordance with site licensing conditions and the relevant regulations.	Yes.

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
Monitor Carnaby's Black-Cockatoo populations	Establish a regular monitoring programme for local populations in conjunction with WA Museum research project.	2012	Head of Environment and Climate	The Carnaby's Black-Cockatoo Research Program includes field investigations within the vicinity of the Forrestania area. In addition, onsite staff and contractors are encouraged to report sighting of Carnaby's Black-Cockatoo to site environmental staff. Reported sightings are recorded in a fauna log which is filed on the site server.	Yes.
	Monitoring programme to be undertaken by WA Museum	Annually	Head of Environment and Climate	Mr Ron Johnstone and Mr Tony Kirkby from the WA Museum have undertaken all monitoring associated with the Carnaby's Black-Cockatoo research project.	Yes.
Regular review of the Conservation Management Plan	Develop annual reports in accordance with statutory requirements including reports to DSEWPC and DEC.	Annually	Head of Environment and Climate	Compliance assessment report meets the reporting requirements of the CBCMP.	Yes.

Management Objective	Management Action	Timing	Responsibility	Compliance Assessment	Compliant
	Review Conservation Management Plan	Once every 5 years	Head of Environment and Climate	The CBCMP was reviewed internally on the 17/07/2021 and no changes were needed to the version uploaded onto Control Document Management System.	Yes

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WESTERN AREAS NL
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FORRESTANIA NICKEL PROJECT

SPOTTED QUOLL – COSMIC BOY HAUL ROAD

CARNABY'S BLACK COCKATOO CONSERVATION MANAGEMENT PLAN

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April 2012

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PLATES

1.0 INTRODUCTION

1.1 PURPOSE

This Carnaby's Black Cockatoo Management Plan has been prepared to minimise and monitor any impacts on local Carnaby's Black Cockatoo *Calyptorhynchus latirostris* populations arising from the construction of the Spotted Quoll – Cosmic Boy Haul Road which is part of Western Areas NL (WANL) Forrestania Nickel Project (FNP).

In accordance with Condition 4 of the EPBC Act Approval Notice (2011/6003) the Carnaby's Black Cockatoo Management Plan will be implemented immediately upon the Departments approval of the plan.

1.2 PROJECT OVERVIEW

WANL are currently mining the Flying Fox underground mine (M77/582 and M77/545) and the Spotted Quoll Open Pit (M77/583). WANL also operate a processing plant and Tailings Storage Facility (TSF) at Cosmic Boy and have commenced development of the Diggers South mining project at Digger Rocks (M74/58, M74/57 and M74/90).

WANL has commenced development of the Spotted Quoll underground mine. Currently ore is being hauled by truck, via a mix of public and "on-lease" roads to be processed at WANL's Cosmic Boy nickel concentrator. The number of loaded cycles on these roads has increased significantly over the past 24 months and will continue to do so as all three mines reach maximum production levels. WANL operations staff undertook a safety risk assessment of the use of haulage trucks on public gazetted roads during 2009. The preferred option to minimise the risks associated with haulage on the public roads was to build a private haul road on WANL owned tenements. Other options involved significant upgrades and road modification to existing public gazetted roads, requiring significant impact (clearing) and a residual risk to the safety of public road users (due to increased road trains and the environmental conditions (often thick fog or dust in these areas).

The proposed haul road will be approximately 15.8 km in length, 5.7 km of which follows an existing 3 m wide track.

A maximum of 40.74 ha of vegetation will be cleared for the construction of the haul road, of this 6.45 ha has been identified as potential Carnaby's Black-Cockatoo breeding habitat. The total disturbance (including existing disturbed areas) is 43.32 Ha. The average width of the haul road footprint is approximately 25m (including surface water management earthworks). The running surface of the road will be 13m wide.

1.3 PROPOSED TIMEFRAMES

Construction of the haul road is planned to commence in the first quarter of 2011 (pending environmental approvals) and will take approximately 3 – 4 months to construct, clearing of areas identified as containing potential Carnaby's Black-Cockatoo habitat will be completed within 1 month of commencement and prior to Carnaby's breeding season in July.

Anticipated timeframes are outlined in table 1 below.

Table 1 - Proposed Timeframes for Construction

Action	Commencement	Duration
Mark out of clearing	March 2012	1 week
Clearing 6.45 ha of potential Carnaby's Black-Cockatoo habitat	March 2012	1 month
Clearing remaining 34.29 ha	March 2012	2 months
Construction of Road	March 2012	3 months

1.4 ASSESSMENT AND APPROVALS HISTORY

The Spotted Quoll – Cosmic Boy Haul Road Mining Proposal was submitted to the Department of Mines and Petroleum (DMP) on 21 April 2011. The project was then referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) under the *Environmental Protection and Biodiversity Conservation* (EPBC) *Act 1999.* On 19 July 2011, DSEWPC assessed the project as a 'controlled action' under the EPBC Act 1999 based on potential impacts on the endangered Carnaby's Black-Cockatoo.

The proposed action involves the clearing of approximately 6.45 Ha of potential breeding habitat and up to 23 potential breeding hollows, and no significant potential foraging habitat for the Carnaby's Black-Cockatoo in the proposed development area. A mitigation and offset strategy has been submitted to the DSEWPC for review to compensate for the loss of approximately 6.45 ha of potential breeding habitat and up to 23 potential breeding hollows of Carnaby's Black Cockatoo in the proposed project area.

2.0 PROJECT BACKGROUND

2.1 LOCATION

The project is situated approximately 160 kilometres south of Southern Cross and 80 kilometres east of Hyden in the Shire of Kondinin, Western Australia (refer to figure 1).

2.1.1 Ownership and Land Tenure

The proposed haul road will be constructed on Mining Leases 77/399, 77/589, 77/588, 77/587, 77/586, 77/584 and 77/583 which are 100% owned by WANL (refer to figure 2). Table 1 shows the current status of mining tenements relating to this project.

Table 2 - Current Status of Mining Leases

TENEMENT	DATE GRANTED	EXPIRY DATE
M77/399	8/11/1989	7/11/2031
M77/589	28/09/1993	27/09/2014
M77/588	28/09/1993	27/09/2014
M77/587	28/09/1993	27/09/2014
M77/586	28/09/1993	27/09/2014
M77/584	28/09/1993	27/09/2014
M77/583	28/09/1993	27/09/2014

Figure 1 - Location of Forrestania Nickel Project

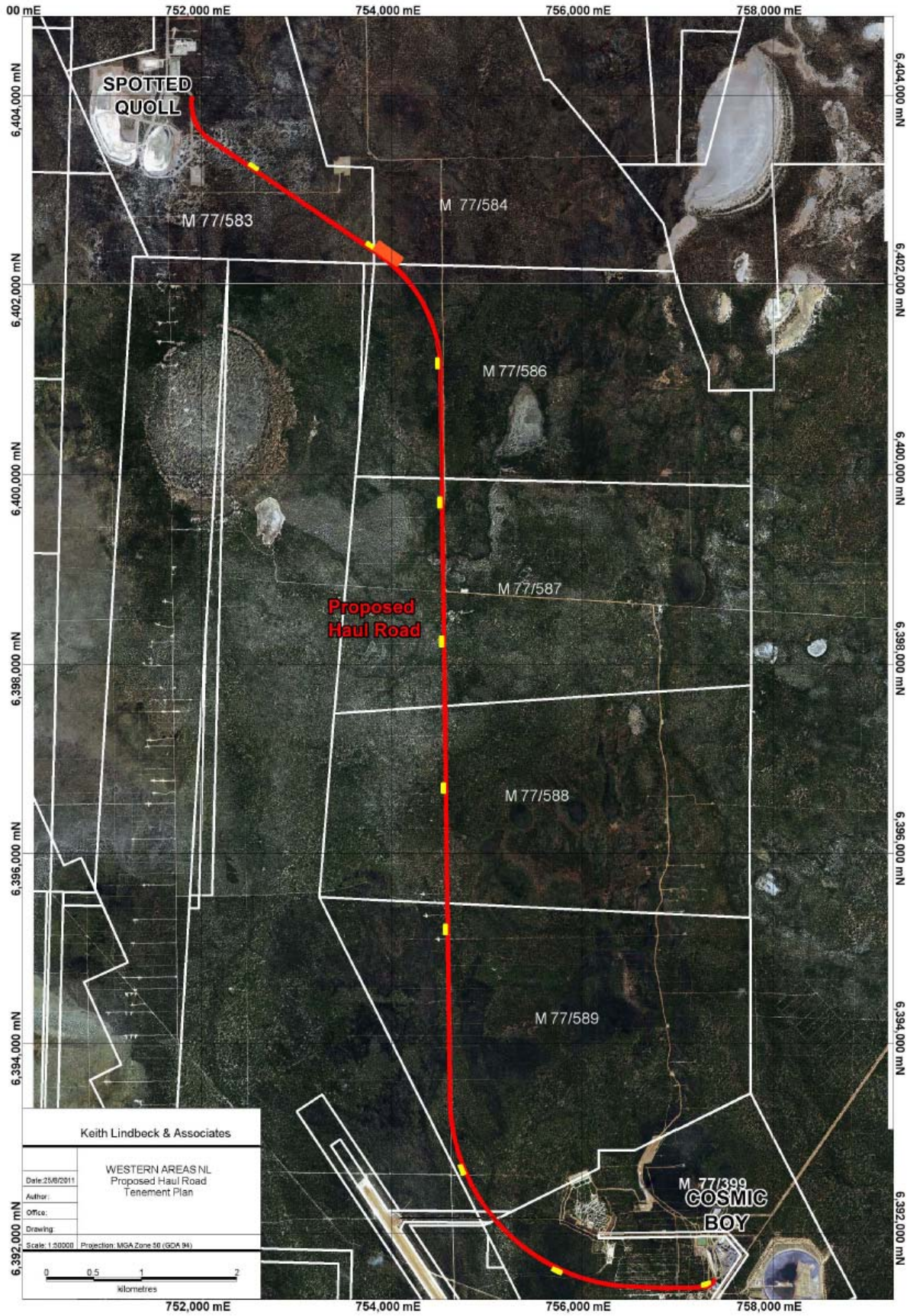

Figure 2 - Tenure of the Spotted Quoll – Cosmic Boy haul road.

2.2 FAUNA SURVEYS

Comprehensive fauna surveys have been conducted for the proposed haul road area. These include:

- A single phase fauna survey conducted by Biota from 30th November to 9th December 2009 (Biota, 2010)
- A targeted Level 2 fauna survey conducted by Keith Lindbeck & Associates in June and July 2010 (KLA, 2010).

During the Biota survey in 2009, three Carnaby's Black-Cockatoos were observed flying over the area. Based on these results WANL commissioned Keith Lindbeck and Associates (KLA) to conduct a targeted fauna survey for the following four species of conservation significance and their habitat:

- Chuditch (*Dasyurus geoffroii)*;
- Malleefowl (*Leipoa ocellata);*
- Carnaby's Cockatoo (*Calyptorhynchus latirostris);* and
- Western Rosella (inland spp.) (*Platycercus icterotis xanthogenys).*

The targeted survey conducted by Keith Lindbeck & Associates did not record any sightings however 23 potential hollows were recorded and these are shown in Figure 4 and Table 2 (KLA, 2011). The survey indicated that only some sections of the proposed haul road route comprise vegetation with attributes that support hollows and potential hollows for Carnaby's Cockatoo and primarily this vegetation is described as "Burnt *Eucalyptus salmonophloia* woodland over Mixed Mallee shrubland". Single or sparse *E. salmonophloia* in other vegetation groups particularly in the southern section of the proposed haul road route also provide potential habitat for these species.

3.0 THE SPECIES

3.1 DESCRIPTION OF THE SPECIES

Carnaby's black-cockatoo, *Calyptorhynchus latirostris,* (formerly called the short-billed form of the white-tailed black cockatoo) is a large, black-cockatoo with a white patch on its cheek, white bands on its tail, and a strong curved bill. In males, the bill is black and the eye-ring dark-pink. Females have a light grey bill, grey eye-ring, and the cheek patch is less distinctive (DEC, 2011).

Plate 1 - *Calyptorhynchus latirostris*

3.2 DISTRIBUTION AND GENERAL ECOLOGY

Carnaby's Cockatoo is endemic to southwest Western Australia, extending from the Murchison River to Esperance, and inland to Corrow, Kellerberrin and Lake Cronin (Johnstone and Storr 1998). Carnaby's Cockatoo is scarce and patchily distributed in the driest parts of its range and in the extreme south-west. It has shown a reduction in its range, particularly in the northern and eastern areas of the wheatbelt, largely because of clearing for agriculture (Cale 2003).

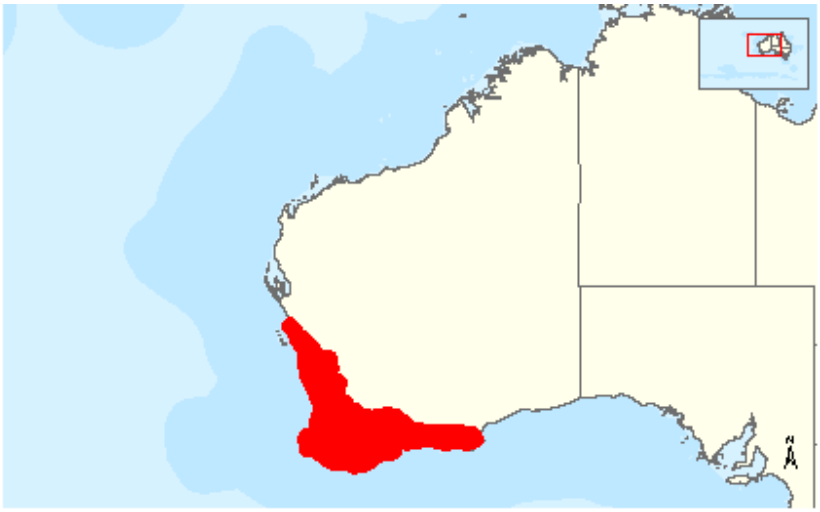

Figure 3 - Distribution of *Calyptorhynchus latirostris (DSEWPAC, 2011)*

Carnaby's Black-Cockatoo has a present population of approximately 11,000 – 60,000 birds (Saunders *et al.* 1985) that is divided into three to five sub-populations (Garnett and Crowley 2000). Its extent of occurrence has contracted approximately 30% since the 1940s (Mawson 1997).

Eucalypt woodlands containing *Eucalyptus salmonophloia* (Salmon Gum) and *E. wandoo* (Wandoo) is the preferential breeding habitat for Carnaby's Cockatoo. However, the availability of suitable nesting hollows, which can take 120 to 150 years to develop (Pittman *et al.* 2007), will influence breeding success together with the availability of nearby foraging grounds (DSEWPC 2011). Foraging habitat generally includes shrub-land or kwongan health-land dominated by *Hakea*, *Banksia* and *Grevillea* species (Morcombe 2003). However, Carnaby's may seasonally forage in marri, exotic pine forests (DSEWPC 2011) or on farmed fruit and nut trees (Pittman *et al*. 2007). The distance between foraging grounds and nesting sites vary, but can be over 12 km as demonstrated in one study by Saunders (Saunders 1980).

Nests are generally more than two metres above ground level, at least 0.1 m deep (DSEWPC 2011) and are mostly lined with wood dust (Johnstone and Storr 1998). The parents live in solitary pairs throughout the breeding season and generally return to the same breeding grounds each year (Higgins 1999).

The loss and fragmentation of habitat, the clearance of health-lands around breeding sites, and the removal of native vegetation corridors are considered principle factors in the decline of the Carnaby's Cockatoo (DSEWPC 2011). Furthermore, the reduced availability of suitable nesting hollows compounded by competition for nesting hollows by other bird species, such as the Galah and Western Corella, and by the European bee are other factors. Other threats include predation by Wedge-tailed Eagles, vehicular trauma and the abandonment of nests following disturbance (DSEWPC 2011).

Carnaby's Cockatoo do not reach breeding age until at least four years of age (Saunders 1982) and can live for 40 – 50 years (DSEWPC 2011). Cale (2003) estimates that the generation time to be 15 years. Hence, threatening processes have a high potential to cause significant declines in populations, and that any recovery of the species will be relatively slow, especially considering those birds that do breed successfully in a season are very unlikely to have more than one fledged offspring.

3.3 SPECIES RECORDED IN THE PROJECT AREA

Very small numbers of Carnaby's Cockatoo occur in the region during the breeding season, which occurs from September to January, suggesting that most are probably migrants returning from the Lake Cronin and Hatters Hill feeding areas (Johnstone, Johnstone and Kirkby 2008).

Three individual Carnaby's Cockatoo were seen flying overhead in the southern area of the proposed haul road during a recent Single Phase Fauna Survey (Biota 2010). Biota (2010) reported that this species had been recorded in past surveys within the Forrestania area.

The targeted survey conducted by Keith Lindbeck & Associates did not record any sightings however 23 potential hollows were recorded and these are shown in Figure 4 and Table 2 (KLA, 2011). The survey indicated that only some sections of the proposed haul road route comprise vegetation with attributes that support hollows and potential hollows for Carnaby's Cockatoo and primarily this vegetation is described as "Burnt *Eucalyptus salmonophloia* woodland over Mixed Mallee shrubland". Single or sparse *E. salmonophloia* in other vegetation groups particularly in the southern section of the proposed haul road route also provide potential habitat for these species. The survey included an area to the west of the proposed haul

road to determine if hollows and potential hollows were confined to the area proposed for disturbance or were present elsewhere. Results from this survey indicated that the vegetation outside of the proposed haul road route also supports habitat characteristics favoured by Carnaby's Cockatoo. Thus, vegetation comprising hollows and potential hollows for Carnaby's Cockatoo is not limited to areas within the proposed haul road route. Therefore, the project is unlikely to alter the conservation significance of this species.

3.4 CONSERVATION STATUS

The Carnaby's Black Cockatoo is listed Endangered under Environmental Protection and Biodiversity Protection Act 1999 and Schedule 1: Rare and likely to become extinct under the Wildlife Conservation Act 1950.

Table 3 – Table showing Vegetation Groups and associated Carnaby breeding habitat to be cleared and proportion of hollows within disturbance area

Vegetation group	Total area surveyed (ha)	Total area to be cleared (ha)	% of each veg group to be cleared	Total area of Carnaby's breeding habitat to be cleared (ha)	% Carnaby's breeding habitat to be cleared of total clearing for haul road (ha)	Proportion of Carnaby's hollows within disturbance area
E. salmonphila woodland	25.29	1.05	4.15	0	Nil	Nil
Burnt *E. salmonphila* woodland over mixed mallee	135.57	13.42	9.90	4.55	11.17	16.34
Sub-group *Melaleuca hamata* thicket	13.33	4.59	34.43	Nil	Nil	Nil
E. urna woodland	17.72	3.24	18.28	1.30	3.19	5.42
Mixed Mallee shrubland	2.95	0.55	18.64	Nil	Nil	Nil
E. goniocarpa shrubland	7.49	1.53	20.43	Nil	Nil	0
Sub-group *E. horistes* Mallee	0.06	0.05	83.33	Nil	Nil	0
Sub-group *Melaleuca* thicket	0.38	0.12	31.58	Nil	Nil	0
Mallee/Mix shrub BIF	18.24	1.61	8.83	Nil	Nil	0
E. livida woodland	8.55	0.55	6.43	Nil	Nil	0
E. eremophila/E. cylindrocarpa	30.66	2.73	8.90	0.30	0.74	0.29
Rehabilitation Area	9.04	1.20	13.27	Nil	Nil	0
Mixed Mallee over *Melaleuca*	131.91	10.10	7.66	0.3001	0.74	0.30
E. salubris woodland	8.63	Nil	Nil	Nil	Nil	Nil
TOTAL	**409.82**	**40.74**		**6.45**		**23**

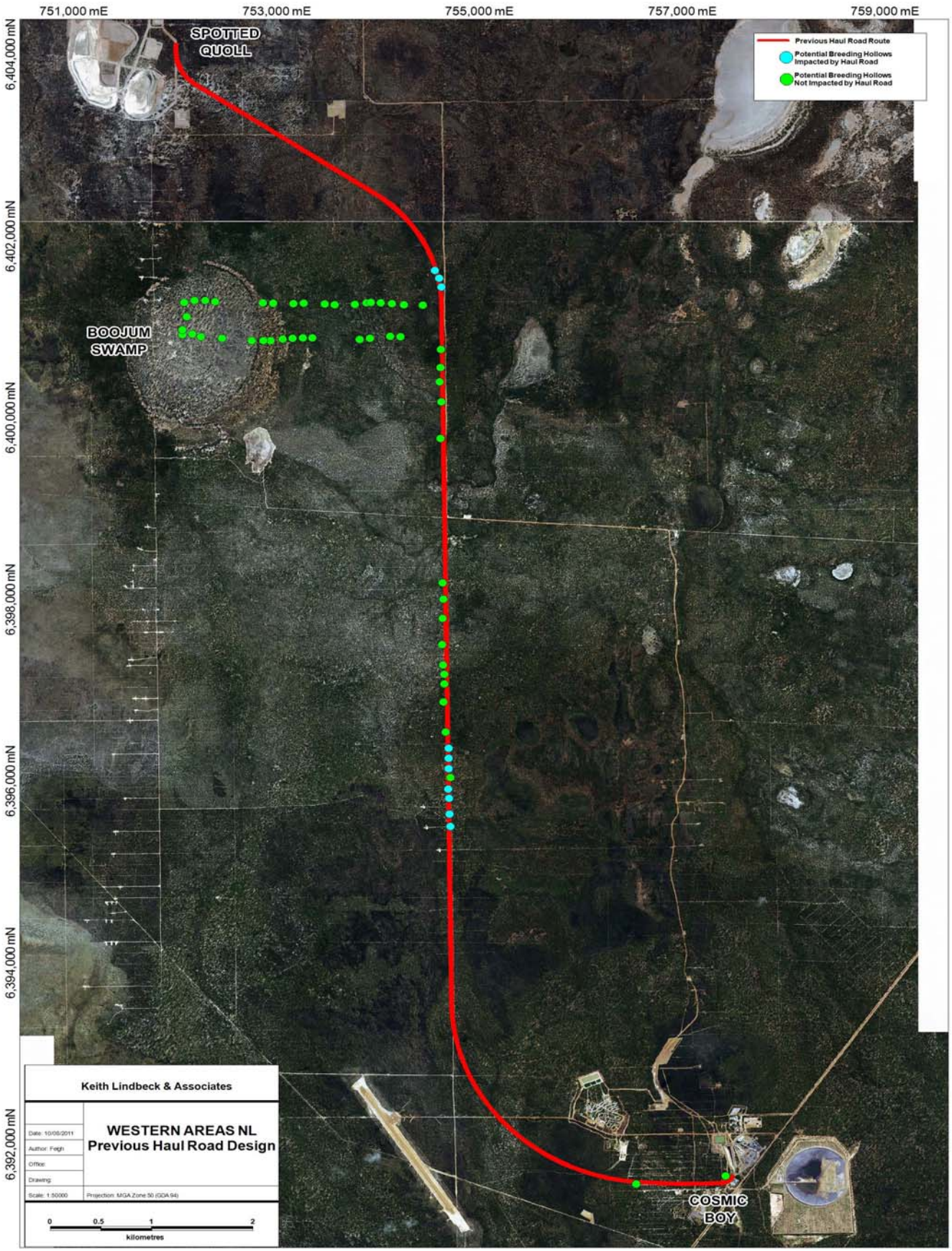

Figure 4 – Areas of proposed haul road with potential breeding hollows

4.0 POTENTIAL IMPACTS AND ON SITE MANAGEMENT

Objective 1: To avoid and minimise impacts on the Carnaby's Black-Cockatoo

Action - Identify and retain areas that support *Carnaby's Black-Cockatoo* and their habitat and protect them from clearing

Potential Impact

Clearing of native vegetation will cause permanent loss of potential Carnaby's Black-Cockatoo habitat and could potentially contribute to impact on populations that may move into the area.

A maximum of 40.74 ha of vegetation will be cleared for the construction of the haul road, of this 6.45 ha is potential Carnaby's Black-Cockatoo habitat.

Management Actions

1. All ground disturbance will be in accordance with Forrestania Nickel Project Ground Disturbance Request Procedure (WANL-ENV-PRO-012) whereby sign-off for vegetation clearance must be authorised by the WANL Environmental Manager/Officer (see Appendix 1)
2. Ensuring no more than 40.74 ha of remnant native vegetation is removed in the project area.
3. Prior to clearing commencing, the haul road will be walked by WANL Environmental staff and areas to be cleared will be well-defined to avoid over clearing. Clearing boundaries will be set out by a qualified surveyor using a differential GPS and marking with biodegradable flagging tape.
4. All clearing will be supervised by the WANL Environmental staff.
5. During Clearing operations daily 'toolbox' meetings will be held to discuss proposed clearing during the day.
6. Weekly 'cleared to date' survey pick up data will be assessed by WANL environmental staff.
7. Restricting traffic to established roads and parking areas so as not to disturb vegetation. The area is on private land restricted to personnel working for WANL.
8. Induction of employees to ensure disturbance is confined to areas identified clearly in the field and the limits on the clearing footprint.
9. Areas of vegetation disturbed temporarily during the construction of the haul road will be rehabilitated immediately following the completion of construction.
10. All large trees and stags with hollows will be avoided where possible.
11. If clearing is to occur during the breeding season, the following actions will be implemented;

11 (a) Each potential breeding hollow will be inspected prior to clearing within 400m. A suitably qualified environmental professional will be employed to assess each potential hollow.

11 (b) WANL environmental staff will create exclusion zones with yellow and black caution flagging tap around any active breeding hollows and prohibit all staff and contractors from entering this area without permission of the WANL environmental staff.

11 (c) Clearing for the project will be restricted during the breeding season to those areas of the haul road outside a 400m zone from any potential breeding hollow.

Action - Educate employees and contractors of the importance of conserving Carnaby's Black Cockatoo and their habitat

Potential Impact
Without education and information, the expectation that employees and contractors appreciate the value of Carnaby's Black Cockatoo and their habitat would be unreasonable.

Management Actions

1. All staff and contractors will attend a compulsory environmental induction which will include information on Carnaby's Black Cockatoo, in particular photos and details on breeding hollows and foraging habitat. Information about the known locations of the species, species management and incidents will be provided to staff and contractors.

2. A copy of this management plan to be distributed to staff and contractors working on the construction of the proposed haul road.

Objective 2: Fire Management

Action - Reduce the risk of occurrence of large fires

Potential Impact
Fire ignition and subsequent spread may present a significant threat to Carnaby's habitat. WANL has prepared a Fire Management Plan to address the issues of potential fire risks which might be caused by the proposed operations and accordingly, establish appropriate management and mitigation measures.

Management Actions
1. Firebreaks will be constructed and maintained on the project area in accordance with legislative requirements;
2. Undertake annual fuel-loading assessments on WANL tenements and consider appropriate management options in consultation with Department of Environment and Conservation and Fire and Emergency Services Authority;
3. Conducting a baseline fuel loading assessment prior to the commencement of the project to determine the background levels of potential fire risks;
4. As required by state mining legislation, the Forrestania Nickel project will maintain an Emergency Response team trained in Emergency Response which includes the outbreak of fire both on the surface and underground. This team will be deployed where required in the event of an out-break of fire;
5. All vehicles will be fitted with two-way radios that can also be used in an emergency situation;
6. Public bushfire danger warnings from the Bureau of Meteorology will be used to predict the level of bushfire risk within the Project Area. Appropriate response strategies (for example issue of "hot work" permits may be suspended during periods of extreme fire danger) will be developed accordingly;
7. Fire management monitoring requirements will be reviewed after the initial 12 months of operation and adjusted if necessary;
8. All WANL employees and contractors will be required to report any potential fire risks to the site manager via their supervisor;

9. All records of fire management monitoring kept in accordance with this plan will be summarised in the Annual Environmental Review, which will be submitted to the Department of Mines and Petroleum, and the DEC;

Objective 3: Control Feral Animals

Action - Reduce the number of feral animals and potential death of Carnaby's Black Cockatoo by predation

Potential Impact
Feral animal control measures need to be implemented to protect the Carnaby's Black Cockatoo from predation.

Management Actions
1. Annual 1080 baiting will occur at strategic locations in the Forrestania region by an authorised person.
2. Undertake annual trapping for feral cats in the vicinity of operations in the Forrestania region.
3. Food waste will be disposed into local rubbish tips near Cosmic Boy and Spotted Quoll mining areas.
4. Local rubbish tips will be fenced and compacted with soil regularly to limit the availability of edible waste to both feral and native animals.

Objective 4: Monitor Carnaby's Black Cockatoo populations

Action - Establish a monitoring system in the project regional area

Potential Impact
Baseline knowledge of the local Carnaby's Black Cockatoo population is fundamental to their conservation. Establishing a repeatable monitoring system is the most effective way for collecting scientifically robust data. Ongoing monitoring will also provide valuable information in relation to the effectiveness of predator control.

Management Actions
1. Establish a regular monitoring programme for local populations in conjunction with WA Museum research project. Monitoring activities will be undertaken on an annual basis and results will be subject to review following each monitoring event.
2. The monitoring programme will be undertaken by WA Museum, annually for the duration of the Carnaby's Black-Cockatoo research funding.

Objective 5: Review of Conservation Management Plan

Action - Regularly review status of the Conservation Management Plan by environmentally appropriate people

Justification
The existing Conservation Management Plan must be reviewed and modified on a regular basis in light of monitoring results and progress on management actions.

Management Actions
1. Develop annual reports in accordance with statutory requirements including reports to DSEWPC and DEC.

2. Undertake a review of this Conservation Management Plan after two years of its implementation (or more frequently where results indicate this is required) and then determine the frequency of review but no less than once every five years.

5.0 MANAGEMENT PROGRAM SUMMARY

Table 4 - Management Program Summary

Management Objective	Action	Timing	Responsibility
avoid and minimise impacts on the Carnaby's Black-Cockatoo	Disturbance will be in accordance with Forrestania Nickel Project Ground Disturbance Request Procedure (WANL-ENV-PRO-012)	During clearance	Environmental Manager
	Ensuring no more than 40.74 ha of remnant native vegetation is removed in the project area.	During clearance	Onsite Environmental Officer
	Prior to clearing commencing, the haul road will be walked by WANL Environmental staff and areas to be cleared will be well-defined to avoid over clearing.	Prior to clearing	Onsite Environmental Officer
	All clearing will be supervised by the Environmental staff.	During clearing	Onsite Environmental Officer
	During Clearing operations daily 'toolbox' meetings will be held to discuss proposed clearing during the day	During clearing	Onsite Project Manager
	Weekly 'cleared to date' survey pick up data will be assessed by WANL environmental staff.	During clearing	Onsite Project Manager
	Restricting traffic to established roads and parking areas so as not to disturb vegetation.	Upon commencement of construction and ongoing	Onsite Project Manager
	Induction of employees to ensure disturbance is confined to areas identified clearly in the field.	Upon commencement of construction and ongoing	Onsite Environmental Officer
	Areas of vegetation disturbed temporarily during the construction of	Upon commencement of construction and ongoing	Onsite Environmental Officer

	the haul road will be rehabilitated.		
	All large trees and stags with hollows will be avoided where possible.	During clearance	Construction personnel
	If clearing is to occur during the breeding season, the following actions will be implemented		
	Each potential breeding hollow will be inspected prior to clearing within 400m. A suitably qualified environmental professional will be employed to assess each potential hollow	Prior to clearing	Onsite Environmental Officer
	WANL environmental staff will create exclusion zones with yellow and black caution flagging tap around any active breeding hollows and prohibit all staff and contractors from entering this area without permission of the WANL environmental staff	Prior to clearing	Onsite Environmental Officer
	Clearing for the project will be restricted during the breeding season to those areas of the haul road outside a 400m zone from any potential breeding hollow	During clearance	Onsite Environmental Officer
	All staff and contractors will attend a compulsory environmental induction which will include information on Carnaby's Black Cockatoo, in particular photos and details on breeding hollows and foraging habitat. Information about the known locations of the species, species management and incidents will be provided to staff and contractors	Prior to clearing	Onsite Environmental Officer
	A copy of this management plan to	Prior to clearing	Environmental Manager

	be distributed to staff and contractors working on the construction of the proposed haul road		
Fire Management	Firebreaks will be constructed and maintained on the project area in accordance with legislative requirements.	Upon commencement of construction and ongoing	Forrestania General Manager
	Undertake annual fuel-loading assessments on WANL tenements and consider appropriate management options in consultation with DEC and FESA.	Annually	Onsite Environmental Officer
	Conducting a baseline fuel loading assessment prior to the commencement of the project to determine the background levels of potential fire risks	Prior to clearing	Onsite Environmental Officer
	As required by state mining legislation, the Forrestania Nickel project will maintain an Emergency Response team trained in Emergency Response which includes the outbreak of fire both on the surface and underground. This team will be deployed where required in the event of an out-break of fire	Upon commencement of construction and ongoing	Forrestania General Manager
	Vehicles will be fitted with two-way radios that can also be used in an emergency situation.	Upon commencement of construction and ongoing	Onsite Project Manager
	Public bushfire danger warnings from the Bureau of Meteorology will be used to predict the level of bushfire risk within the Project Area.	Upon commencement of construction and ongoing	Onsite Project Manager
	Fire management monitoring	Annually	Environmental Manager

	requirements will be reviewed after the initial 12 months of operation and adjusted if necessary.		
	All WANL employees and contractors will be required to report any potential fire risks to the site manager via their supervisor.	Upon commencement of construction and ongoing	All site employees and contractors
	All records of fire management monitoring kept in accordance with this plan will be summarised in the Annual Environmental Review, which will be submitted to the Department of Mines and Petroleum and DEC.	Upon commencement of construction and ongoing	Environmental Manager
Control Feral Animals	Annual 1080 baiting will occur at strategic locations in Forrestania region.	Annually	Environmental Manager
	Undertake annual trapping for feral cats.	Anually	Onsite Environmental Officer
	Food waste will be disposed into local rubbish tips near Cosmic Boy and Spotted Quoll mining areas.	Upon commencement of construction and ongoing	All site employees and contractors
	Local rubbish tips will be fenced and compacted with soil regularly to limit the availability of edible waste to both feral and native animals.	Upon commencement of construction and ongoing	Forrestania General Manager
Monitor Carnaby's Black Cockatoo populations	Establish a regular monitoring programme for local populations in conjunction with WA Museum research project.	2012	Environmental Manager
	Monitoring programme to be undertaken by WA Museum	Annually	Environmental Manager
Regularly of the Conservation	Develop annual reports in	Annually	Environmental Manager

Management Plan	accordance with statutory requirements including reports to DSEWPC and DEC.		
	Review Conservation Management Plan	Every two years	Environmental Manager

6.0 PERFORMANCE INDICATORS

The progress of the Conservation Management Plan will be regularly reviewed and modified in the light of new information, monitoring results and progress on management actions. WANL will review and update the plan two years after implementation depending on results which may indicate that an earlier change in strategy is required. Timing of subsequent reviews will be determined after the initial review but will occur no later than at five year intervals.

WANL's performance will be reviewed against the following indicators:

- Identification and retention of Carnaby's Black Cockatoo habitat;
- Reduction of fire risk due to the construction of the haul road;
- Monitoring (and reporting outcomes) of current and future distribution of Carnaby's Black Cockatoo;
- Workforce awareness of Carnaby's Black Cockatoo conservation measures; and
- No known decline in the viability of local Carnaby's Black Cockatoo populations.

7.0 RESPONSIBILITY

7.1 *FORRESTANIA GENERAL MANAGER*

Overall responsibility for ensuring that the site environmental management requirements are met during the life of the project will rest with the Forrestania General Manager. This responsibility will include:

- Ensuring that all construction and operational site personnel are aware of their environmental responsibilities and obligations;
- Ensuring that all contractor staff are fully inducted and are aware of their environmental responsibilities and obligations; and
- Allocating resources to ensure that commitments can be met.

7.2 *ENVIRONMENTAL MANAGER*

The Environmental Manager is responsible for:

- Ensuring that the Carnaby's Black Cockatoo Conservation Management Plan is implemented and reviewed when required.
- Ensuring annual reports required under State and Commonwealth approvals are prepared and submitted.

7.3 *ONSITE ENVIRONMENTAL OFFICER*

The Onsite Environmental Officer is responsible for:

- Ensuring that all construction and operational site personnel are aware of their environmental responsibilities and obligations.
- All areas are appropriately marked out prior to clearing.
- Coordinating seed collection in consultation with the DEC.

- Ensuring annual reports required under State and Commonwealth approvals are prepared and submitted.

7.4 *ONSITE PROJECT MANAGER*

The Onsite Project Manager is responsible for:

- Ensuring that all staff and contractors are provided a copy of this Conservation Management Plan.
- Ensuring all staff and contractors attend environmental inductions.

7.5 *SITE PERSONNEL*

Site Personnel are responsible for:

- Working in accordance with this Conservation Management Plan.
- Reporting non-compliance with this Conservation Plan, environmental incidents or emergencies to their Supervisor.

8.0 DECOMMISSIONING PHASE

Any rehabilitation or decommissioning activity within the Carnaby's Black Cockatoo habitat areas will be undertaken in a manner which is consistent with the Project Mine Closure Plan required under The Mining Act (1978). A Mine Closure Plan consistent with other project areas of the Forrestania Nickel Project is included as Appendix 2.

Any areas temporarily disturbed will be rehabilitated as soon as possible once construction has been completed. The active haul road will be decommissioned once the haul road and Forrestania Nickel Project Operations conclude.

The rehabilitation of the haul road and associated infrastructure will be guided by the following principles:

- Ensure that vegetation clearing is kept to the minimum;
- Minimise soil erosion;
- Collect and correctly stockpile vegetative material and topsoil, where available, for lateruse along the haul road;
- Rehabilitate the haul road upon completion of ore haulage activities;
- Only use local native plant species, including species that have the potential to provide breeding habitat for Carnaby's Black Cockatoo; and
- Undertake decommissioning and closure of the haul road to industry leading practice principles and to statutory requirements.

8.1 *CLOSURE CRITERIA*

- All infrastructure (e.g. signage) will be removed and disposed of appropriately.
- All disturbed areas will be reshaped to blend into the landscape and rehabilitated.
- All disturbed areas will be revegetated.

- Ensure rehabilitated roads are not a drainage barrier for local vegetation.

8.2 *SUMMARY OF CLOSURE ACTIONS*

Haul Road
Rehabilitation and closure of the haul road will involve:

- Remove culverts and other associated infrastructure.
- All table drains and windrows along roads and tracks will be pulled or pushed back and stockpiled growth medium will be respread.
- Contour to restore natural drainage. Contour erosion control banks will be constructed across the roads. On steep sections, the banks will not be more than 40 m apart and not more than 100 m apart on low gradient sections.
- Re-spread stockpiled topsoil.
- Deep rip surface to alleviate compaction and encourage re-growth of native vegetation.
- Seed with local native vegetation.
- Planting tubestock species with potential to provide Carnaby's Black Cockatoo habitat
- Spread stockpiled vegetation where available across the area.
- Restrict access (install bunds across all roads to reduce third party access).

Gravel Pits
Rehabilitation and closure of the gravel pits will involve:

- Reshape gravel pit to blend in with its surrounding area.
- Respread stockpiled topsoil.
- Deep rip surface to alleviate compaction and encourage re-growth of native vegetation.
- Seed with local native vegetation.
- Planting tubestock species with potential to provide Carnaby's Black Cockatoo habitat
- Spread stockpiled vegetation where available across the area.
- Rehabilitation will occur at the completion of road construction.

Topsoil and Vegetation Stockpile Areas
Rehabilitation and closure of stockpile areas will involve:

- Deep rip surface to alleviate compaction and encourage re-growth of native vegetation.
- Seed with local native vegetation.
- Planting tubestock species with potential to provide Carnaby's Black Cockatoo habitat
- Spread stockpiled vegetation where available across the area.
- Rehabilitation will occur at the completion of road construction.

8.3 *CLOSURE MAINTENANCE AND MONITORING*

Post closure, a monitoring programme will be developed, in accordance with the requirements of the Mining Act (1978) and recent guidelines published by the Department of Mines and Petroleum and the Environmental Protection Agency WA, to document progress of rehabilitation. The following methods of monitoring will be

used as rehabilitation performance indicators; landscape function analysis, species richness, density and photographic monitoring

8.4 *CONTINGENCY ACTIONS*

In the event that the decommissioning and rehabilitation performance indicators have not been achieved (i.e. survival rate of less than 80% for potential habitat species after 2 years), contingency actions or strategies will need to be implemented to achieve the performance indicators. Such actions may include:

- Review and further remediation of potentially contaminated areas.
- Re-seeding.
- Planting of seedlings.
- Importing alternative growth media.

WANL will implement the above contingency actions in the event that it is identified that the decommissioning and rehabilitation performance indicators are not being achieved.

9.0 AUDITING

A fully qualified independent person / consultant will conduct compliance audits of the commitments outlined in this management plan annually.

If WANL are found to be non-compliant with any commitments outlined in this management plan, the DSEWPC will be notified.

10.0 REPORTING

10.1 WANL INTERNAL REPORTING

All employees and contractors will be required to report any issues relating to the conservation of local Carnaby's Black Cockatoo populations to the Site Environmental officer, via their supervisor. Issues include sightings, or other evidence of their presence, for example hollows. Action in response to the report will depend on the nature of the report.

10.2 ENVIRONMENTAL REPORTING

All environmental reporting will be completed in accordance with statutory requirements and submitted to the appropriate authorities when required.

Annual Environmental Reports for each tenement are required to be submitted to the Department of Mines and Petroleum, annually on the 30th September of each year.

Additionally, Within three months of every 12 month anniversary of the commencement of the action, WANL will publish a report on our website addressing compliance with each of the conditions of EPBC approval 2011/6003.

11.0 REFERENCES

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Appendices

Appendix 1 – WANL Ground Disturbance Procedure

Appendix 2 – Spotted Quoll – Cosmic Boy Mine Closure Plan

Appendix 1 – WANL Ground Disturbance Procedure

WESTERN AREAS NL

A.B.N. 68 091 049 357

Forrestania Nickel Project

Ground Disturbance Request & Approval Procedure

WSA-ENV-PRO-012

Rev	Description	Author	Checked by	Approved by	Date	Next Review Date
0	Ground Disturbance request and Approval Procedure	CH	DC	DC	7th May 2011	7th May 2011

CONTENTS

1.0 PURPOSE

This procedure is to ensure that clearing and other ground disturbance activities on Western Areas NL (WSA) tenements at the Forrestania Nickel Project are carried out in compliance with relevant legislation; tenement, permit and/or license conditions; and under appropriate government approvals. Furthermore, to limit the risk of Priority and Declared Rare Flora (DRF) from being accidently 'taken'; Schedule I fauna being negatively impacted; and for compliance and reporting purposes.

2.0 INTRODUCTION

'Ground disturbance' (GD) for the purpose of this procedure includes the following in non-hardstand areas where environmental health of the surrounding environment is not affected: trenching, digging, leveling, boring, removal of existing surface (including clearing), taking of vegetation by any means (refer to *Section 5.0*), removal of topsoil, installation of fencing, or similar.

Ground disturbances on WSA tenements consist principally of clearing for exploration purposes, gravel pits and related mine infrastructure. An approved internal *Ground Disturbance Request* (GDR) form is required by WSA personnel and contractors alike prior to GD activities commencing.

3.0 RESPONSIBILITIES

Overall approval for GD activities at the FNP is the responsibility of the Environmental Department.

Where GD is required on site, it is the responsibility of the WSA-nominated supervisor seeking Ground disturbance Approval (GDA) to complete a GDR. This form is reviewed by the WSA Environmental Officers (EOs), and must be signed by all parties and granted before the GD can commence. The nominated supervisor is to ensure that the approved GD is conducted according to set GDA conditions.

3.1 Delays for governmental approvals and surveys

It is the responsibility of the WSA-nominated supervisor seeking GDA to ensure that relevant surveys and governmental approvals are in place, or to allow a sufficient amount of time to gain these, prior to when the GD is required.

3.2 Timeframes for lodgement of internal GDR

It is the responsibility of the contractor or department seeking GDA to provide a GDR form to the Environmental Department no later than seven days in advance for exploration activities and large projects[1], and no later than three days in advance of small projects[2], to ensure there are no delays in obtaining GDA.

[1] *Ground disturbance activities spanning more than three days and/or in more than two work areas.*
[2] *Ground disturbance activities conducted in no more than two work areas, and of no longer than three days duration.*

3.3 Changes to the GD activity following GDA

If the works is required to deviate from the GDR set conditions, or in any other area of the GDR, notice is to be provided by the supervisor to the EOs in writing advising of the changes. These changes must first be approved in writing (includes email) by the rostered Environmental Officer before the altered GD can commence.

4.0 PROCEDURE

The GDR form consists of three sections that reflect the different authorities involved in the internal ground disturbance and approval process. The first section is completed by the WSA-nominated supervisor requesting the GD activity. Requests must be made for specific areas of ground disturbance.

The second section is completed by the EO. The *Approval* section includes the details of GDR approval by the site WSA EOs, and stipulates the conditions under which approval is granted. The EO records the reason(s) where the GDR is not approved.

The supervisor and contractor signs off on the GDR, thereby agreeing to the conditions as set down by the GDR.

A flowchart of the GDR procedure is shown in *Figure 1*.

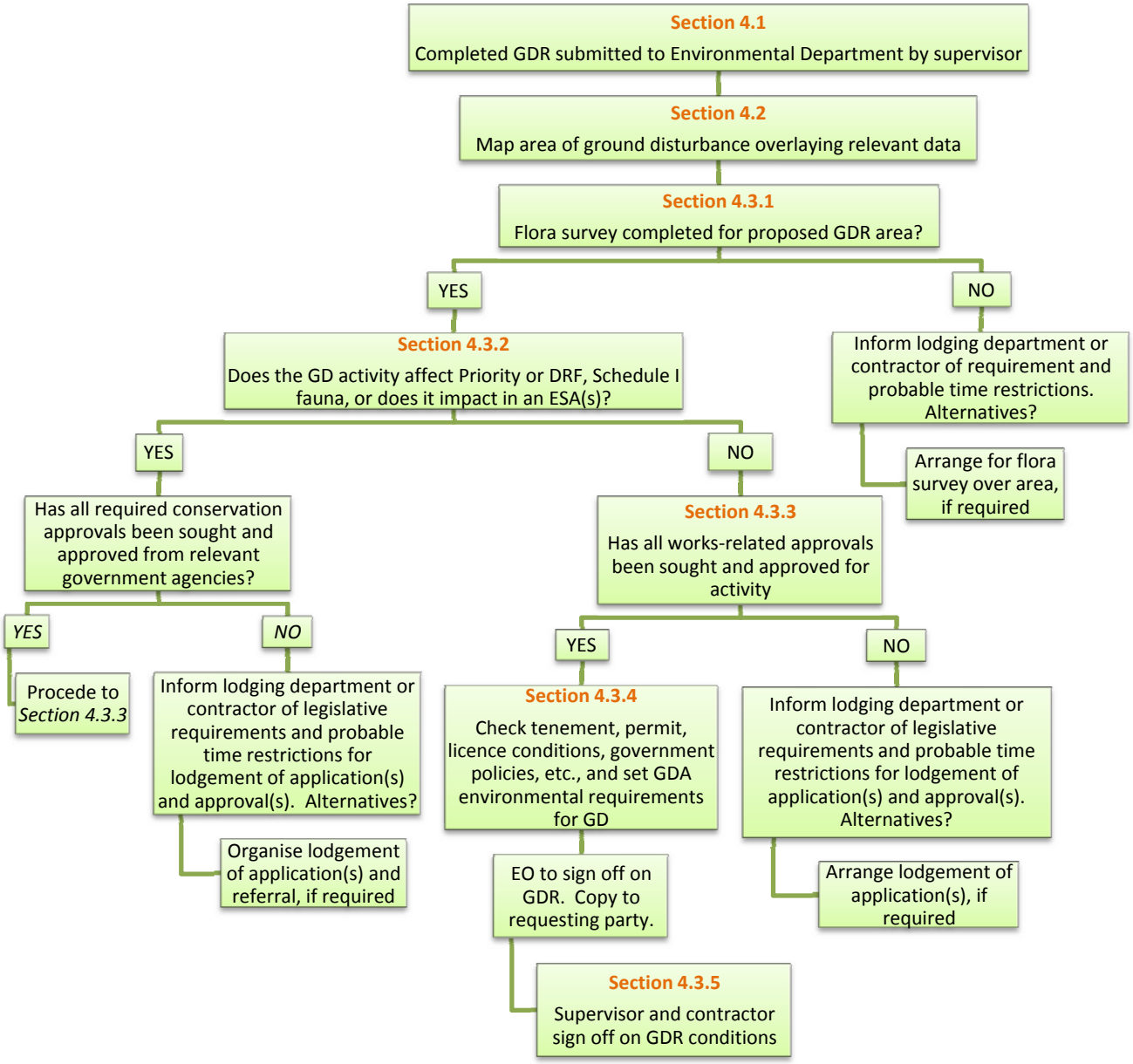

Figure 1: Flow diagram of GDR procedure at the FNP

4.1 Completion and lodgement of GDR by supervisor

The WSA-nominated supervisor requesting the GD activity completes the site details and work descriptions, and attaches the relevant work plans (the Environmental Department can aid with this if required). The supervisor further stipulates the method and the precautions that will be taken in order to minimise environmental impact; for example, flagging.

The EO may request further information, such as a risk assessment, depending upon the nature of the ground disturbance activity.

For exploration activities a detailed work plan is to be included, including coordinates of the GD area, and for exploration other than diamond and RC drilling programmes, an equipment/vehicle/machinery list and general details of the work method; accurate start and finish dates; and nominated onsite supervisors for the period.

4.2 Mapping of Ground Disturbance

Using ArcGIS 9.2, the WSA EO maps the GD on the aerial photograph and overlays the following spatial data:

- DRF (including buffer) & Priority Flora;
- Environmentally Sensitive Areas;
- WSA tenements
- Contours;
- Roads and tracks; and
- Infrastructure, and other details of note in the area (e.g., monitoring points).

Export map to PDF and print; include with GDR.

4.3 Review of Ground Disturbance Request

The WSA EO records the tenement number and gives the GDR a unique *Ground Disturbance Request ID* specified. For example:

10-GD-005

The first two digits denote the last two digits of the year in which the GDR was generated, and the last three digits is its consecutive number in that year block.

The EO may only give final GDR approval if the activity does not contravene tenement, licensing, or permit conditions, and the necessary government approvals are in place and are valid. The following section outlines this process.

4.3.1 Completion of a flora survey

In most cases a flora survey is required prior to any ground disturbance activities taking place. Check that a flora survey has been completed over the proposed GD area. If a flora survey has not been completed, inform the requesting party of the requirements and the approximate timeframes. Organise the survey, if required.

4.3.2 Consideration of flora, fauna, heritage and landforms including those of conservational significance

Ascertain whether DRF or Priority flora, Schedule I fauna, Environmentally Sensitive Areas (ESAs), etc., are affected by the proposed GD. If none of these are affected by the proposed GD, proceed to *Section 4.3.3*.

If any of these are affected by the proposed GD, ascertain that all the relevant approvals have been sought and approved; if not, liaise with the requesting party and inform them of the requirements. Arrange lodgement of application(s), if required.

Expected timeframes for obtaining governmental approval from the time of lodgement is outlined in the table, over:

Government Agency	Licence/Permit/other approval	Approximate timeframe
DMP	Clearing Permit	8 – 12 wks
DEWHA	Referral/Permit	1 – 12 months but can vary depending on the size and scale of the project

If all approvals have been received, proceed to *Section 4.3.3*.

4.3.3 Project-related approvals

Ascertain that all approvals have been received for the proposed GD; if not, liaise with the requesting party and inform them of the requirements. Lodge application(s), if required.

Expected timeframes for obtaining governmental approval from the time of lodgement is outlined in the below table:

Government Agency	Licence/Permit/other approval	Approximate timeframe
DMP	LOI	6 wks
	PoW	6 wks
	Mining Proposal	12 weeks
DoW	26D/5C Licence	8 wks
DEC	Works Approval	8 wks
	Prescribed Premises Licence	12 wks
EPA	Environmental Impact Assessment	1 – 12 months, but can be more depending on scale and impact of proposal

These do not take into consideration timeframes for bond lodgement.

If all approvals have been received, proceed to *Section 4.3.4*.

4.3.4 Setting of Ground Disturbance Approval conditions

The Environmental Department sets the GDR conditions; these may include the following:

- Clearing envelope to be surveyed;
- No large trees to be taken;
- Topsoil to be stockpiled separately to vegetation;
- Minimal disturbance area required for operation;
- Risk assessment of activity; and
- Washing down of vehicle first.

However, the conditions must reflect the tenement conditions, licensing and permitting conditions and any other conditions stipulated in relevant government approvals, legislation, government policies, etc., and take into account the following:

- Where an area is not clearly demarcated (such as an old gridline) or more than approximately 50 trees/shrubs are to be taken, the area must be clearly flagged prior to clearing.
- Where clearing falls within 200 m of an ESA, then the area must be clearly demarcated and the EO must be present at the time of clearing.
- Where the EO believes there is a chance that protected flora or fauna may be impacted, he/she must be present at the time of clearing.
- In the New Morning/Spotted Quoll areas, a WSA EO must inspect the site for DRF prior to GD.

4.3.5 Supervisor and contractor sign off on GDR conditions

The supervisor and contractor sign off on the GDR, agreeing to abide by the conditions set by the GDA in accordance with this procedure.

4.4 Distribution of completed GDR form

The completed and approved/disproved GDR form is to be filed in the *WSA Ground Disturbance Request Approvals* folder with a copy emailed/given to the requesting party for their records. An electronic copy is to be filed in the Ground Disturbance Register, located at:

> *Y:\Companydocuments\Environmental\04_Environmental Monitoring and Management\14_Ground Disturbance Register\Ground Disturbance Requests*.

5.0 DEFINITIONS & ABBREVIATIONS

Definitions:

Clearing – the killing or destruction of, removal of, severing or ringbarking of trunks or stems of, or doing of any other substantial damage to some or all native vegetation in an area..

Declared Rare Flora (DRF) – flora which is deemed to be likely to become extinct, or is rare, or otherwise in need of special protection.

Native vegetation – indigenous aquatic or terrestrial vegetation, including dead vegetation.

Priority Flora – Flora declared to be protected under state law; they include rare taxa, and poorly known taxa suspected of being threatened.

To take – to gather, pluck, cut, pull up, destroy, dig up, remove or injure flora or to cause or permit the same to be done by any means.

Abbreviations:

EO – Environmental Officer
ESA – Environmentally Sensitive Area
GD – Ground disturbance
GDA – Ground disturbance approval
GDR – Ground disturbance request
WSA – Western Areas N.L.

GROUND DISTURBANCE REQUEST FORM

Ground Disturbance ID: ..... **- GD -** .....

This form is to be used in conjunction with WSAs 'Ground Disturbance Request & Approval Procedure'

WSA-NOMINATED SUPERVISOR

Site Details and Work Description:

Project Area *(e.g., Flying Fox)*: .....

Description/coordinates of site: .....

.....

Description of ground disturbance: .....

Purpose of work: .....

Proposed disturbance area: .....m^2

Volume of material to be excavated: .....m^3

Proposed starting date: ...../...../..... Proposed end date: ...../...../.....

Attachments:

Work plan attached *(refer to procedure):* ☐ Yes ☐ No

Do you require certain areas to be flagged off? ☐ Yes ☐ No

If yes, please include details: .....

Precautions taken and method of work to be used: .....
.....
.....
.....

WSA ENVIRONMENTAL OFFICER

Tenement number(s): .....

Related ground disturbance requests: .....

Relevant approvals granted: ☐ Yes ☐ No ☐ N/A

Details *(if applicable):* .....
.....
.....
.....
.....

Comments and conditions for proposed action:

Conditions: .....
.....
.....
.....
.....
.....

Other comments: .....
.....
.....

Environmental approval:

Is approval granted: ☐ Yes ☐ No

Reason *(if not granted)*:
.....
.....
.....

Name: .....

Signature: ..... Date: ...../...../.....

N.B. approval can only be given if the appropriate government approvals have been granted, and the work complies with relevant legislation, and tenement, permit and/or license conditions

WSA-NOMINATED SUPERVISOR AND CONTRACTOR SIGNOFF

Approval is given subject to meeting the conditions set out in this document, including stipulated work conditions and those set by the WSA Environmental Officer. By signing this document you agree to abide by these conditions in accordance with the WSA Ground Disturbance Request and Approval Procedure.

Work provisions (contractor)

Contractor: .....

Signature *(work supervisor)*: ..... Date: ...../...../.....

Supervisory approval:

WSA-nominated supervisor *(name)*: .....

Signature: ..... Date: ...../...../.....

Copy to all interested parties
Copy to GDR register
Original to file (Environmental Department)

Appendix 2 – Spotted Quoll – Cosmic Boy

Haul Road Mine Closure Plan

Environmental consulting services
PO Box 6213, South Bunbury WA 6230
pekenviro@bigpond.com

ABN 71 631 606 020
Ph/fax: 08 9795 5887
Mobile: 0428 414 607

Forrestania Nickel Project
Spotted Quoll to Cosmic Boy Haul Rd

(M77/583, M77/584, M77/586, M77/587, M77/588, M77/589 and M77/399)

EPBC Referral 2011/6003

Conceptual Closure Plan

(Version 2012/1)

Prepared for: WESTERN AREAS NL

January 2012

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1.0 PURPOSE AND SCOPE

1.1 Closure Plan Purpose

The purpose of this Conceptual Closure Plan (CCP) is to ensure that Western Areas NL (WANL) have a strategy that can be used on their Spotted Quoll to Cosmic Boy haul road (the Proposal) to work towards realistic and achievable closure goals, and so that WANL can meet required regulatory objectives, as follows:

- To meet the requirements of the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) recent approval conditions for the Proposal, set for the purposes of the *Environment Protection and Biodiversity Conservation Act (1999), (EPBC Act)*; and
- To develop a document which works towards meeting the Department of Mines and Petroleum (DMP) and Environmental Protection Authority (EPA) joint publication "*Guidelines for Preparing Mine Closure Plans*" (henceforth referred to as "*the guidelines*") with a view to incorporation into a document which meets full compliance with the guideline by June 2013.

1.1.1 DSEWPC Approval Conditions

The Proposal was recently assessed and approved for the purposes of the EPBC Act (EPBC 2011/6003; henceforth known as *"the approval"*) by the DSEWPC. The approval incorporates 10 conditions which must be met to enable implementation of the Proposal. The approval has been included as Appendix 1 of this document. Condition 4 requires that a Carnaby's Black-Cockatoo Management Plan be developed and implemented (Table 5).

1.2 CCP Scope

This current version (2012/1) of the CCP is focussed on decommissioning and closure of the Spotted Quoll to Cosmic Boy Haul Road in accordance with the following DSEWPC directives included in Condition 4:

(A) Details of revegetation/rehabilitation of the haul road to be undertaken upon decommissioning of the mine.

(B) Planting protocols for rehabilitating the haul road, including procedures for maintenance for a period of two years.

(C) Details of the replanting schedule should the survival rate of revegetation plantings be less than 80% after two (2) years.

In line with Condition 4, the CCP supports the Carnaby's Black Cockatoo Management Plan completed by Keith Lindbeck and Associates (KLA), henceforth referred to as KLA (2012).

2.0 PROJECT BACKGROUND

2.1 Ownership and land tenure

The mining leases referred to in this CCP, M77/583 and M77/584, M77/586, M77/587, M77/588, form a part of the WANL Forrestania Nickel Project (FNP). The tenements are located on Unallocated Crown

Land (UCL) in the Shire of Kondinin and are 100% owned and operated WANL (Figure 1 and Figure 2, Section 11). Tenement details are shown in Table 1.

Table 1: Current status of mining tenements

TENEMENT	OWNER	DATE GRANTED	EXPIRY DATE	MINERAL RIGHTS
M77/583	Western Areas NL	28/09/1993	27/09/2014	WANL
M77/584	Western Areas NL	28/09/1993	27/09/2014	WANL
M77/586	Western Areas NL	28/09/1993	27/09/2014	WANL
M77/587	Western Areas NL	28/09/1993	27/09/2014	WANL
M77/588	Western Areas NL	28/09/1993	27/09/2014	WANL
M77/589	Western Areas NL	28/09/1993	27/09/2014	WANL
M77/399	Western Areas NL	08/11/1989	07/11/2031	WANL

The postal address for WANL FNP operations is as follows:

Western Areas NL
PO Box 1891
West Perth WA 6872

Key senior management and operational staff for the FNP are listed in Table 2:

Table 2: Current list of key management and operational staff at FNP

Position	Incumbent	Telephone Contact Details
Managing Director	Mr Dan Lougher	(08) 9334 7777
Registered Manager (FNP)	Mr Ken McKenzie	(08) 9891 0200
Mining Manager (FNP)	Mr Duncan Sutherland	(08) 9891 0200
Environmental Manager	Mr Darren Coulson	(08) 9334 7777

2.2 Project Overview

WANL propose to construct a 15.8 km haul road between their Spotted Quoll and Cosmic Boy mining areas.

The key characteristics of the Proposal as approved are listed in Table 3 as follows:

Table 3: Key project characteristics for the Proposal (Source KLA 2011).

Element	Description
General	
Duration of haulage	Continuous
Haul Road length	15.8 kms
Haul Road running width	13 m
Haul Road disturbance total width	up to 20 m
Total disturbance area	41.12 hectares

Area of Vegetation Disturbance	No more than 40.74 hectares
Total area of Rehabilitation	A minimum of 40.74 hectares
Material movements • Waste rock for Haul Road subgrade material	~45,000 tonnes total
Operation	
Operating Life	~ 10 - 15 years
Truck movements	15 – 22 triple or quad road trains per day
Operating hours	24 hrs per day, 29 days per month
Material movements • Ore haulage	~ 600,000 tonnes per annum.

For further detail, see Section 3 of the Mining Proposal completed for the Proposal by Keith Lindbeck and Associates, KLA (2011) which has been included as Appendix 2.

Disturbance sub-domains that are associated with the Proposal are listed in Table 4.

Table 4: Disturbance domains and sub-domains associated with the Proposal

Tenement	Domain description	Total domain disturbance area (ha)	Sub-domain	Subdomain area (ha)
M77/583	Roads and tracks	6.35	SQ-CB Haul Rd	5.80
			Topsoil laybys	0.52
			Vegetation storage	0.03
M77/584	Roads and tracks	3.55	SQ-CB Haul Rd	0.50
			Gravel Pits	2.99
			Topsoil laybys	0.03
			Vegetation storage	0.03
M77/586	Roads and tracks	5.79	SQ-CB Haul Rd	5.45
			Gravel Pits	0.01
			Topsoil laybys	0.3
			Vegetation storage	0.03
M77/587	Roads and tracks	5.93	SQ-CB Haul Rd	5.30
			Topsoil laybys	0.6
			Vegetation storage	0.03
M77/588	Roads and tracks	4.91	SQ-CB Haul Rd	4.58
			Topsoil laybys	0.3
			Vegetation storage	0.03
M77/589	Roads and tracks	8.32	SQ-CB Haul Rd	7.69
			Topsoil laybys	0.6
			Vegetation storage	0.03
M77/399	Roads and tracks	6.27	SQ-CB Haul Rd	5.69
			Topsoil laybys	0.55
			Vegetation storage	0.03
	Total	**41.12**		**41.12**

A plan showing the locations of the sub-domains of the Proposal as listed in Table 4, is included as Figure 3, Section 11.

3.0 CLOSURE OBLIGATIONS AND COMMITMENTS

A legal obligations register detailing obligations and commitments specifically related to mine closure has been developed for the Proposal and includes both the surface operations and the underground operations. The closure obligations and commitments register has been included in Table 5. Annual monitoring reports and the close out report for Spotted Quoll will need to show that these obligations and commitments have been or are being met (or are no longer applicable) to enable the site to be fully relinquished back to the State.

Table 5: Spotted Quoll Mine – Closure Obligations and Commitments Register

Relevant Department of Mines and Petroleum Mining Act Tenement Conditions			
Tenement No.	**Condition No.**	**Conditions potentially affecting closure outcomes**	**Status**
M77/399, M77/588, M77/587, M77/586, M77/584.	11, 10, 10, 17, 18.	At the completion of operations, or progressively where possible, all access roads and other disturbed areas being covered with topsoil, deep ripped and revegetated with local native grasses, shrubs and trees to the satisfaction of the Environmental Officer, Department of Industry and Resources DOIR.	Active
M77/399, M77/583.	12, 19.	At the completion of operations, all buildings and structures being removed from site or demolished and buried to the satisfaction of the Director, Environment Division, DMP.	Active
M77/399, M77/583.	13, 20.	All rubbish and scrap is to be progressively disposed of in a suitable manner.	Active
M77/399, M77/589, M77/588, M77/587, M77/586, M77/583.	14, 11, 17, 17, 23, 17.	All topsoil vegetation being removed ahead of all mining operations and being stockpiled appropriately for later respreading or immediately respread as rehabilitation progresses.	Active
M77/399, M77/589.	37, 12.	On the completion of operations or progressively when possible, all waste dumps, tailings storage facilities, stockpiles or other mining related landforms must be rehabilitated to form safe, stable, non-polluting structures which are integrated with the surrounding landscape and support self-sustaining, functional ecosystems comprising suitable, local provenance species or an alternative agreed outcome to the satisfaction of an Environmental Officer, DMP.	Active
M77/399, M77/589, M77/588, M77/587, M77/586, M77/584, M77/583.	38, 19, 18, 18, 24, 24, 23.	A Mine Closure Plan is to be submitted in the Annual Environmental Reporting month specified in tenement conditions in the year specified below, unless otherwise directed by an Environmental Officer, DMP. The Mine Closure Plan is to be prepared in accordance with the *"Guidelines for Preparing Mine Closure Plans"* available on	Active

		DMP's website: • 2013.	

Department of Sustainability, Environment, Water, Populations and Communities (DSEWPC) Spotted Quoll Project – Approval EPBC 2008/4443		
Condition No.	**Condition description**	**Status**
4	*To mitigate potential impacts on the Carnaby's Black-Cockatoo, the person taking the action must develop a Carnaby's Black-Cockatoo Management Plan. The Carnaby's Black - Cockatoo Management Plan must include:* • *Vegetation clearing protocols, which must ensure that no more than 40.74 ha of remnant native vegetation on site is removed;* • *Vegetation clearing protocols should construction take place during the breeding season for the Carnaby's Black-Cockatoo;* • *Timeframes for staging the clearing and construction works;* • *Details of revegetation/rehabilitation of the haul road to be undertaken upon decommissioning of the mine;* • *Planting protocols for rehabilitating the haul road, including procedures for maintenance for a period of two years;* • *Details of the replanting schedule should the survival rate of revegetation plantings be less than 80% after two (2) years;* • *Measures to be implemented to manage feral animals;* • *Measures to be implemented to manage the risk of fire in the area;* • *Roles and responsibilities of contractors, staff and the person taking the action prior to, during and post construction;* • *Program for reporting and monitoring; and* • *Timeframes for the implementation and management of the above measures. The Carnaby's Black-Cockatoo Management Plan must be submitted to the department for approval prior to construction commencing. If the department approves the plan, the approved plan must be implemented.*	Active

Mining Proposal – Commitments			
Mining Proposal Name	**Section No.**	**Commitment affecting Mine Closure**	**Status**
Forrestania Nickel Project Spotted Quoll to Cosmic Boy Haul Road.	10	Ensure all machinery is cleaned down to reduce weed and disease introduction and spread.	Active
		Remove and stockpile vegetative material and topsoil.	
		All ground disturbance will be in accordance with Forrestania Nickel Project Ground Disturbance Request Procedure.	
		Regular assessment of roadside vegetation health will be undertaken by WANL Environment Department.	

		50 individual plants of *Stenanthemum liberum (P1)* will be flagged prior to avoid disturbance.	
		Staff and contractors will be made aware of the weed species in the area during the site induction and will be advised to report any weed establishment to the WANL Environment department.	
		Regular inspections will be carried out to assess weed establishment on the haul road.	
		WANL will ensure that seed collected for use in rehabilitation programs is free of weeds.	
		23 culverts will be installed to facilitate efficient drainage.	
		Water trucks with dibble bars will be utilised on the length of the haul road during ore transport to control dust.	
		Only use local native plant species [in rehabilitation].	
		Undertake decommissioning and closure of the haul road to industry leading practice principles and to statutory requirements.	
		Haul roads and access tracks not required for post closure monitoring commitments or by the local Shire or other tenement holders/statutory authorities will be rehabilitated.	
		Remove culverts and other associated infrastructure.	
		All windrows along roads and tracks will be pulled or pushed back and stockpiled growth medium will be respread.	
Forrestania Nickel Project Spotted Quoll to Cosmic Boy Haul Road	10	Contour to restore natural drainage. Contour erosion control banks will be constructed across the roads where required. On steep sections, the banks will not be more than 40 m apart and not more than 100 m apart on low gradient sections.	Active
		Re-spread stockpiled topsoil and vegetation material.	
		Deep rip surface to alleviate compaction and encourage regrowth of native vegetation.	
		Spread stockpiled vegetation where available across the area.	
		Seed with local native vegetation.	
		Restrict access (install bunds across all roads to reduce third party access).	

Legislation for which requirements must be met during decommissioning and closure	
Legislation name	**Responsible Agency**
Aboriginal Heritage Act 1972	Department of Indigenous Affairs
Contaminated Sites Act 2003	Department of Environment and Conservation
Contaminated Sites Regulations 2006	Department of Environment and Conservation

Dangerous Goods Safety Act 2004	Department of Mines and Petroleum
Dangerous Goods Safety Regulations (various) 2007	Department of Mines and Petroleum
Environment Protections and Biodiversity Conservation Act 1999	Department of Sustainability, Environment, Water, Populations and Communities.
Environmental Protection Act 1986 Part V	Department of Environment and Conservation
Environmental Protection Regulations 1987	Department of Environment and Conservation
Environmental Protection (Unauthorised Discharges) Regulations 2004	Department of Environment and Conservation
Health Act 1911	Department of Health/Shire of Kondinin
Mining Act 1978	Department of Mines and Petroleum
Mining Regulations 1981	Department of Mines and Petroleum
Mines Safety and Inspection Act 1994	Department of Mines and Petroleum
Mines Safety and Inspection Regulations 1995	Department of Mines and Petroleum
Occupational Safety and Health Act 1984	Department of Commerce
Rights in Water and Irrigation Act 1914	Department of Water
Wildlife Conservation Act 1950	Department of Environment and Conservation

4.0 EXISTING ENVIRONMENTAL DATA AND INFORMATION

Section 4.0 will be updated annually to incorporate any changes to the Proposal and so that where relevant the outcomes of monitoring and trials undertaken during the reporting year can be included.

4.1 Existing Climate

The climate in the general Forrestania area is semi-arid to arid and can be characterised by its relatively low annual rainfall and large temperature range. The Hyden Bureau of Meteorology (BOM) Station is the closest BOM station to the Proposal area and is located 72 kilometres to the west. Average climatic data for the Hyden station are shown in Table 6.

Mean annual maximum temperature is 24.9^{o}C and mean annual minimum 9.8^{o}C. Daily maxima above 40^{o}C are usual from November to March. The coldest month is July and diurnal temperature variations are commonly high throughout the year.

The area is semi-arid and the annual average rainfall at Hyden is 342.5 millimetres (mm). Most of the rain falls between May and August and this amount varies greatly both seasonally and annually.
The average wind speeds at Hyden vary throughout the year from 5.7-9.9 kilometres per hour in the morning to 7.4 -10.3 kilometres per hour in the afternoon.

During the warmer part of the year (from October to March) the prevailing wind direction is generally from the south east, but can commonly swing around to the north and north east with the passage of summer high pressure systems.

Humidity levels vary considerably both daily and yearly. The mean monthly 9.00 am relative humidity varies from a low of 51% in December/January to a high of 86% in June/July. The mean monthly 3.00 pm relative humidity varies from a low of 28% in January to a high of 58% in July.

Table 6: Climate averages for Hyden BoM weather station (BoM 2011)

Site number: 010568 Latitude: 32.44 °S Longitude: 118.90 °E Elevation: 299 m Commenced: 1928 Status: Open Latest available data: 3 August 2011

Statistic Element	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (Degrees C)	33.6	32.9	30.0	25.5	20.8	17.3	16.3	17.4	20.3	24.6	28.4	31.8	24.9
Mean minimum temperature (Degrees C)	15.4	15.8	14.2	11.0	7.6	5.6	4.6	4.6	5.8	8.1	11.4	13.8	9.8
Mean 9am temperature (Degrees C)	23.2	22.7	20.6	17.3	13.1	10	9.1	10.3	13.2	16.8	20.0	22.3	16.6
Mean 3pm temperature (Degrees C)	32.3	31.7	28.8	24.3	19.5	16.3	15.2	16.3	19.1	23.2	26.9	30.5	23.7
Mean rainfall (mm)	19.3	19.6	19.6	23.9	39.3	49.8	48.1	40.7	27.6	21.5	17.9	13.6	341
Mean number of days of rain ≥1mm	2.2	2.1	2.2	3.5	5.8	8.2	9.1	7.7	5.7	4.0	2.9	2.2	55.6
Mean 9am relative humidity (%)	51	55	59	68	78	85	86	81	72	58	51	51	66
Mean 3pm relative humidity (%)	28	29	34	42	51	57	58	55	47	36	32	29	42
Mean 9am wind speed (km/h) for years 1970 to 2011	9.4	9.4	8.8	6.9	6.1	5.8	5.6	6.9	8.1	9.2	9.9	9.2	7.9
Mean 3pm wind speed (km/h) for years 1970 to 2011	8.8	8.7	8.1	7.3	7.5	8.2	8.4	9.3	10.1	9.6	9.9	9.1	8.7

4.2 Future Climatic Change

The Climate Change in Australia website (http://www.climatechangeinaustralia.gov.au/) shows predictions in changes in a range of climate parameters including temperature and rainfall to 2030, 2050 and 2070 for three emissions scenarios, these being low, medium and high.

The 50th percentile modelling predictions (annual), which can be considered a best estimate for predictions of changes in climate parameters for the year 2030 are shown in Table 7.

Given that the changes predicted are the same for low, medium and high CO_2e emissions scenarios it can be reasonably assumed that regardless of changes to CO_2e emissions now there will be an increase in annual average temperatures and a decrease in annual average rainfall and humidity.

Table 7: Annual change in climate parameters predicted (50th percentile) by 2030 in the Forrestania area

Climate parameter	% change prediction 2030	CO_2e Emissions scenario
Temperature change	+0.6 °C to +1°C	Low, medium & high
Rainfall change	-2% to -5%	Low, medium & high
Relative humidity change	-0.5% to -1%	Low, medium & high
Potential evapotranspiration change	-2% to 4%	Low, medium & high

4.3 Geology

4.3.1 Regional and Site Geology

Newbey (1988) provides a summary of the geology within the general area and notes that there are three main elements of the geology that are fundamental to understanding the development of the landscape as follows:

> "*(a) Most of the Study Area is underlain by Archaean or Proterozoic granites, and associated rocks, which have been eroded into gentle undulating plains and broad valleys covered with Tertiary soils.*
> *(b) There are two small areas of Archaean greenstone: a narrow north-south belt from Hatters Hill to My Holland, and a broad area in the Bremer Range-Mt Day area.*
> *(c) In the south-eastern corner of the Study Area ia a Proterozoic intrusion forming the conspicuous Peak Charles and Peak Eleanora.*"

The Proposal area lies in the Forrestania Greenstone Belt (FGB), a southern extension of the Southern Cross Greenstone Belt. The greenstone belts of the Yilgarn craton are major sequences of basic to ultramafic rocks with varying levels of entrained sedimentary rocks laid down semi-contemporaneously.

The FGB is constrained by the granitoid rocks that developed during the late Archaean / Proterozoic and form the western and eastern boundaries to the FGB. During the period of granite emplacement significant alteration, folding and faulting occurred within the FGB. The most significant alteration to the greenstone "stack" of mafics, ultramafics, and sediments was the formation of a major synclinal structure. This feature dominates the structural geology of the region.

4.4 Landform and soils

4.4.1 Landform

The Forrestania region has low relief and lies approximately 300 m to 500 m above sea level. Forrestania lies within the Salt Lake or Salinaland physiographic division, which includes most of the wheat belt region of Western Australia. This division is characterised by chains of salt lakes, which are relict river systems. Normally the salt lakes act as surface water sinks, but in exceptionally wet years floodwaters move along the palaeodrainage (WSA 2004).

A major topographic divide passes through Forrestania and separates palaeodrainages that lead westwards towards the Avon drainage system and those that lead eastwards to the Eucla Basin (WSA 2004).

Newbey (1988) notes that almost their entire Study Area (which includes the Proposal area to some extent, particularly in terms of landform mapping) consists of gentle undulating uplands dissected by broad valleys containing chains of salt lakes. Newbey (1988) further notes that there has been widespread laterisation of deeply weathered granite with the widespread occurrence of gravel ridges and rare small breakaways as evidence of laterisation.

Newbey (1988) notes that the Ironcap Hills (i.e. the South, Middle and North Ironcaps) are prominent features above the surrounding subdued terrain.

The Biological Surveys Committee (BSC) (1988) mapped the Forrestania and surrounding areas into a series of broad landform units. According to basic mapping provided in BSC (1988), the Proposal area, is probably located partially on the Sandplain (S) landform unit at its southern end (i.e. near Cosmic Boy) ends, with the main Proposal area lying principally on the Undulating Plain; greenstone (UN) and Broad Valley (V) landform units.

These landscape units as described by BSC (1988) area as follows:

*"**Sandplain** (S): The undulating uplands, including the upper and middle valley slopes rarely exceeded 2° and the soil profiles were thick and laterised. Similar Broad Valley was the change of slope from erosional to colluvial. Sandplain slopes rarely exceeded 2° and the soil profiles were thick and laterized. Similar soil profiles in the Belka Valley, extending north-west from the Study Area's north-western boundary, were over 20m thick (Bettenay and Hingston 1964). The high areas of Sandplain were the result of in situ weathering and consisted of Gravelly Sands or Shallow Sands. The soils of low areas of Sandplain (Deep Sands) had a thicker A horizon with a colluvial component derived from high areas. Due to the loose and sandy A horizon, run-off only occurred over short distances following heavy and intense falls of rain. Shallow Sandy Clays occurred as belts across some Sandplain areas. They were 50-120m wide and possibly had developed in situ over bedrock more mafic than granite. Sandplains were a dominant landform unit of the Study Area.*

***Undulating Plains** (greenstone) (UN): Both areas within the Study Area consisted of series of low rises mainly 10 – 15 m high but sometimes large rises were up to 30m high. Slopes varied from 2 to 8 degrees with some bedrock exposures on steeper slopes. Shallow Calcareous Earths covered the rises while, on the intervening flats, colluvial deposits of Deep Calcareous Earths developed. These flats rarely exceeded 200m in width.*

Broad Valley *(V): The major valleys of a previous landscape had become filled with colluvium and alluvium. This material had been frequently reworked – including by Aeolian action. Valley floors are now almost flat and the same soils extend up the valley slopes from 5m to 20m above floor level. Internal slopes rarely exceeded 2°. A range of soil types form a mosaic in most places but the B horizon was always calcareous. Deep Calcareous Earth was the major soil group on the Broad Valley unit. Aeolian Sands formed extensive sheet deposits that sometimes contained subdued sand dunes stabilised by vegetation. Broad Valleys were dominant and widespread within the Study Area."*

Over most of the Proposal area, erosional forces are expected to be mostly in the form of sheet flow with some channelled stream flow along the drainage depressions expected during significant rainfall events.

4.4.2 Soils – Surface

A good summary of soils within the Proposal area is described in KLA (2011). A summary follows:

"The haul road lies within the Avon province and in particular the South-Eastern Zone of the Southern Drainage subsystem. Common soils are sandy duplexes (often alkaline), with ironstone gravely soils, loamy earths (often calcareous) with some loamy duplexes, sandy earths, deep sands and saline wet soils (Tille 2006). Upper levels in the landscape are the eroded elements of a Tertiary lateritic duricrust, with yellow sandplains, gravel and laterite breakaways (Department of the Environment, Water, Heritage and the Arts 2008).

Soil collection along the proposed Spotted Quoll – Cosmic Boy haul road was undertaken by WANL in June 2010 with samples from 45 locations submitted for analysis (Figure 3) [in KLA, 2011]*. The soil sampling program consisted of collection of:*

- *'A' sample – 'topsoil' - taken from the top 100mm consisting of O2 and A1 horizon*
- *'B' sample – 'subsoil' – taken from 100-300mm and consisted largely of A2 horizon and in some cases B horizon (site dependent).*

The samples were then analysed for a range of physical and chemical parameters. A copy of the soil analysis results is attached as Appendix 1[in KLA, 2011].

The samples revealed no element or pH levels of concern, with most plant elements in deficit. High levels of sodium (Na) and Chloride (Cl) were recorded which is normal in most Western Australian soils. The pH levels (in calcium chloride) vary from slightly acidic to alkaline, with that alkalinity indicating that some carbonates are present in the alkaline soils.

Many of the dispersive horizons (0-100 mm and 100-300 mm) are high in sand content. Therefore it would be unlikely that a soil 'aggregate' would be present in these horizons which would disperse on wetting. However, if the soil surface was bared, these 'sandy' surface soils could release the finer clay particles (partial dispersion) on wetting that could result in sealing of the soil surface which could inhibit seed germination by preventing seedling emergence.

The horizons of concern are those that have a high clay content and an Emerson Aggregate Test

(EAT) of 1, 2 and 3. An EAT of 3 is of particular concern as this remoulded aggregate simulates an engineering (layering and re-wetting) treatment of a soil, such as road construction. The "A" horizon samples should not pose a problem for road construction as these horizons will be stripped and stockpiled".

4.4.3 Topsoil Resources

The quantity of topsoil required for rehabilitation has been estimated based on a current native vegetation clearing footprint of ~40.74 ha. Quantity calculations are based on topsoil harvesting depths of between 100 mm and 200 mm. Estimated total recoverable topsoil quantities for the Proposal are shown in Table 8.

Table 8: Topsoil harvested quantities total

Topsoil type	Quantity harvested
Surface stockpiles including vegetation 100 – 200 mm (approximately)	~40,740 m^3 – 81,840 m^3 (approximately)

Topsoil will be managed effectively to ensure that there is enough to complete rehabilitation for the whole Proposal disturbance footprint. If the site is expanded and surface disturbance increased for any reason further topsoil and subsoil resources will be harvested from these areas.

At other FNP sites, WSA have commenced shredding of cleared and stockpiled vegetation using a purpose built heavy duty shredding machine, so that it can be used effectively for revegetation activities. This machine is owned and operated by Shredding Services Pty Ltd and produces a heavy mulch/topsoil mix which can be used on the surface of rehabilitated areas to provide a seed bed, add organic matter and protect the bare sub-surface from erosion as a form of store and release cover system. The feasibility of utilising this process on vegetation cleared from the Proposal area will be investigated and implemented if possible.

Topsoil will be stockpiled in purpose built laybys located at regular intervals along the haul road route. These will be located away from the edges of the haul road to ensure they are not significantly impacted by dust or saline dust suppression water. Topsoil stockpiles will be tested on an annual basis to determine if they are deteriorating in terms of their usefulness for rehabilitation. If a significant increasing trend is noted in parameters such as EC or heavy metals consideration will be given to moving stockpiles to a more protected location.

Proposed topsoil stockpile laybys are shown in Figure 3, Section 11.

4.5 Hydrology

4.5.1 Regional Hydrology

A good summary of regional and surface hydrology is included in Section 2.4 of KLA (2011).

4.6 Flora and Vegetation

4.6.1 Beard's botanical provinces and districts

Based on information presented in Beard (1990), the Proposal area would be located close to the boundary between the South West Botanical Province and the South Western Interzone within the Roe Botanical District.

The Roe Botanical District is one of several Botanical Districts making up the South West Botanical Province.

4.6.2 Interim Biogeographical Regionalisation of Australia (IBRA)

The Proposal area is located adjacent to the boundary between the Coolgardie (COO) and Mallee (MAL) Interim Biogeographical Regions of Australia (IBRA) and the Southern Cross (COO2) and Western Mallee (MAL2) Biogeographical subregions (COO2). CALM (2002a) note that the COO2 IBRA sub region forms a biogeographic interzone. CALM (2002b) note that the MAL2 IBRA sub region forms part of the transitional rainfall zone (i.e. alluding to the biogeographic interzone).

Although located along the boundary between COO and MAL, the entire Proposal is within the COO2 IBRA sub region.

Cowan et al (2001) note that the COO2 IBRA subregion exhibits the following general vegetation characteristics:

"Valleys have Quaternary duplex and graduational soils, and include chains of saline playa-lakes. Diverse Eucalyptus woodlands (Eucalyptus salmonophloia, E.salubris, E transcontinentalis, E. longicornis) rich in endemic eucalypts occur around these salt lakes, on the low greenstone hills, valley alluvials and broad plains of calcareous earths. The salt lake surfaces support dwarf\ shrublands of samphire. The granite basement outcrops at mid-levels in the landscape and supports swards of Borya constricta, with stands of Acacia 14ccurring and Eucalyptus loxophleba. Upper levels in the landscape are the eroded remnants of a lateritic duricrust yielding yellow sandplains, gravelly sandplains and laterite breakaways. Mallees (Eucalyptus leptopoda, E. platycorys and E. scyphocalyx) and scrub-heaths (Allocasuarina corniculata, Callitris preissii, Melaleuca uncinata and Acacia beauverdiana) occur on these uplands, as well as on sand lunettes associated with playas along the broad valley floors, and sand sheets around the granite outcrops. The scrubs are rich in endemic acacias and Myrtaceae".

4.6.3 Beard's vegetation groups

Based on information presented by Shepherd et al (2002) and the pre-European vegetation extent shapefile dataset provided by the Department of Agriculture and Food (DAF), the Proposal area would be located almost exclusively within Beard's "*Medium woodland; salmon gum and morrel*" vegetation formations. A small section of the southern end of the haul road also falls within Beard's *"Shrublands; Acacia, Casuarina and Melaleuca thicket"* vegetation formation.

According to Beard (1972), these formations are included in the Forrestania vegetation system. Beard notes that Forrestania system "*comprises a variety of communities which are controlled by the underlying geology largely in a mosaic form*".

Beard (1972) describes the dominant species in the "*Medium woodland; salmon gum and morrel*" vegetation formation as being *Eucalyptus salmonophloia* and *E. longicornis*. Casual tree species in this formation include *E. salubris* and *E. flocktoniae*. Smaller trees including *E. eremophila* and *E. annulata* make up the middle layer. Dominant undershrubs include *Dodonaea stenozyga*, *Eremophila saligna* and *Daveisia nematophylla*.

In the "*Shrublands; Acacia, Casuarina and Melaleuca thicket*" vegetation formation Beard (1972) notes that this is a "*very dense shrub assemblage consisting of Casuarina, Acacia and Melaleuca species, found on shallow sandy soil underlain by lateritic ironstone gravel or by un-decomposed granite*".

4.6.4 Vegetation extent

The vegetation extent remaining as at 2009 compared to the vegetation extent present prior to European settlement for the COO2 subregion is shown in Table 9*.

Table 9: Vegetation extend remaining in IBRA sub regions

IBRA sub region code	IBRA sub region name	Pre-European extent (ha)	Current extent (ha as at 2009)	% remaining
COO2	Southern Cross	6010832.998	5808059.204	96.6

*(source GWA 2010)

The pre-european and current extent of the "*Medium woodland; salmon gum and morrel "* vegetation group occurring within the COO2 is shown in Table 10*.

Table 10: Medium woodland; salmon gum and morrel extent remaining per IBRA subregion

IBRA sub region code	IBRA sub region name	*Medium woodland; salmon gum and morrel.* Pre-European extent (ha)	*Medium Woodland; salmon gum and morrel.* Current extent (ha as at 2009)	% remaining
COO2	Southern Cross	464,423.79	435,793.61	93.84

*(source GWA 2010)

The pre-european and current extent of the *"Shrublands; Acacia, Casuarina and Melaleuca thicket "* vegetation group occurring within the COO2 is shown in Table 11*.

Table 11: Shrublands; Acacia, Casuarina and Melaleuca thicket extent remaining per IBRA subregion

IBRA sub region code	IBRA sub region name	*Shrublands; Acacia, Casuarina and Melaleuca thicket*. Pre-european extent (ha)	Shrublands; *Acacia, Casuarina and Melaleuca thicket.* Current extent (ha as at 2009)	% remaining
COO2	Southern Cross	953,238.42	933,702.50	97.95

*(source GWA 2010)

It is unlikely that between the time of the GWA 2010 report and the present, that the extent of remaining vegetation in these two vegetation groups would have been reduced further by a significant amount.

4.6.5 Vegetation groups and extent from previous local vegetation surveys

There have been a number of flora and vegetation surveys undertaken in the local vicinity of the Proposal area. These are listed in Table 12 as follows.

Table 12: Flora and vegetation surveys undertaken in the vicinity of the Proposal area.

Survey Title	Survey Author	Survey Report Date
The Biological Survey of the Eastern Goldfields of Western Australia. Part 4 Lake Johnston – Hyden Study Area	Biological Surveys Committee	August 1988
Spotted Quoll/ Cosmic Boy Haul Rd Flora and Vegetation Survey	Botanica Consulting Pty Ltd	September 2010

There were numerous vegetation groups described by Newbey and Hnatiuk (1988) with 16 occurring on these landscape units. These are listed in Table 13.

Table 13: Vegetation groups described by Newbey and Hnatiuk (1988) in the vicinity of the Proposal area.

BSC (1988) Landscape unit	Newbey and Hnatiuk (1988) Vegetation group
Sandplain (S)	*Euclayptus redunca* mallee
	Eucalyptus transcontinentalis mallee
	Melaleuca spp. Tall shrubland
	Eucalyptus eremophila mallee
	Eucalyptus aff*. decipiens* mallee
	Eucalyptus tetragona mallee
	Acacia beauverdiana tall shrubland
	Grevillea eriostachya ssp. excelsior (now *G. excelsior*) tall shrubland
	Acacia signata, Allocasuarina acutivalvis, Allocasuraina campestris ssp. *campestris* (now *A. campestris*) *and Callitris preisii* ssp. *verrucosa* tall shrubland
	Eucalyptus salmonophloia woodland
	Eucalyptus salubris low woodland
	Eucalyptus celastroides var. *virella* mallee
	Eucalyptus georgii low woodland
Undulating Plain (UN)	*Eucalyptus flocktoniae* low woodland
	Eucalyptus ovularis low woodland
	Eucalyptus sp. low woodland
	Greenstone complex
Broad valley (V)	*Eucalyptus longicornis* woodlands and low woodlands
	Eucalyptus flocktoniae low woodland
	Eucalyptus dundasii woodland
	Eucalyptus ovularis low woodland

Broad valley (V)	*Eucalyptus salmonophloia* woodland
	Eucalyptus salubris low woodland
	Eucalyptus diptera low woodland
	Euclayptus cylindrocarpa mallee
	Eucalyptus gracilis mallee
	Eucalyptus transcontinentalis mallee
	Eucalyptus transcontinentalis low woodland
	Eucalyptus sheathiana low woodland
	Eucalyptus aff. occidentalis mallee
	Eucalyptus cylindriflora mallee
	Eucalyptus scyphocalyx mallee
	Eucalyptus leptophylla mallee
	Eucalyptus pileata mallee
	Eucalyptus tetrgona mallee
	Eucalyptus aff. *wandoo* low woodland
	Acacia jennerae tall shrubland
	Eucalyptus spathulata ssp. *grandiflora* mallee
	Melaleuca aff. *preissiana tall* shrubland
	Muehlenbeckia cunninghamii low shrubland

The survey report completed in September 2010 by Botanica Consulting Pty Ltd (Botanica 2010) was a plot based survey that was used in the Environmental Impact Assessment (EIA) process for the Proposal. This survey noted nine vegetation groups within the Proposal area as follows:

(1) Rehabilitation area.
(2) *Eucalyptus urna* woodland.
(3) *E. livida* woodland.
(4) *E. salubris* woodland.
(5) *E. eremophila* subsp. *eremophila* and *E. cylindrocarpa* woodland
(6) Mallee woodland over *Melaleuca*
(7) *E. eremophila* mallee woodland (including a dense Melaleuca hamata thicket).
(8) *E. salmonophloia* woodland.
(9) Scrub heath.

It is difficult to compare the survey work completed by Botanica (2010) with the work completed by BSC (1988) without some type of significant statistical analysis between the results of the two survey efforts. This is unavailable. In addition, a major wild fire swept through the area in the 90's and hence the vegetation structure of many areas has been altered compared to what would have occurred during the BSC (1988) survey work. For these reasons, the flora and vegetation survey work completed by Botanica (2010) will be largely relied upon for the purposes of the mine CCP, as this work was specific to the Proposal area whereas the BSC (1988) survey was not.

The author is of the opinion that the vegetation groups described by Botanica (2010) can be considered sub-groups of the overarching Beard vegetation groups described for the area (see Section 4.6.3). They are

also similar (superficially at least) to the vegetation groups described by Newbey and Hnatiuk (1988) and appear fit well within the broad landscape units described in BSC (1988).

A copy of Flora and Vegetation Report by Botanica has been included as Appendix 3.

4.6.6 Vegetation values and regional significance

The Proposal area falls within the western portion of what is now known as the Great Western Woodlands (Wilderness Society 2009). McQuoid (2009) in Wilderness Society (2009) notes that the greenstones (in this case the Forrestania Greenstone Belt) which underlie the Great Western Woodlands:

"*offer a paradox of mineral and natural wealth*". McQuoid further notes that "*these greenstones significantly impact the landscape by providing more mineralised and richer soils, often with laterised tops and gravel slopes on their low rises. They are intrusions of sedimentary and volcanic rocks into (and out of) the surrounding gneiss of the massive Yilgarn Craton, and bring new soil types and low hills to the Great Western Woodlands. As a result, they are islands across a vast plain where a distinctive flora has evolved*".

There is limited rigorous scientific information available regarding the significance of the vegetation communities within the immediately adjacent surroundings of the Proposal area. However some studies have been completed on the Lake Cronin Nature Reserve area which is located some 22kms to the north of the survey area. The EPA (2009) notes that Lake Cronin Nature Reserve is located within the transitional zone between the wetter South Western Australian Floristic Region and the arid Eremaean Botanical Province. Harrison (1993) in EPA (2009) has been referenced as stating that:

"*transitional/hybrid zones are of extremely high value to nature conservation in that:*

- *Ecological assemblages in transitional zones tend to contain elements and biota from surrounding regions, for this reason ecological assemblages in transitional zones are often unusual, and sometimes unique, in composition.*
- *Many species and ecological assemblages found within transitional zones exist at the edge of their normal range and therefore tend to differ both genetically and characteristically from those residing within their normal range.*
- *Transitional zones provide refuge for species that have declined through disturbances within their normal range, thereby facilitating the recolonisation of depleted species back into surrounding areas post disturbance.*
- *Through genetic variation and a tendency for communities to become isolated during disturbance, transitional zones facilitate speciation and therefore act as important evolutionary drivers.*
- *Transitional zones provide important habitat and linkage resources for migratory species and metapopulations.*"

Cowan et al (2001) have noted that within the COO2 IBRA sub-region the "*Medium woodland: Salmon Gum and Morrel*" and *"Shrublands: Acacia Casuarina and Melaleuca thicket"* vegetation groups are considered as a low priority for reservation under the Comprehensive, Adequate and Representative (CAR) reservation system.

How et al (1988) consider that the extend of the Lake Cronin Nature Reserve (1016 ha) to be inadequate to represent the biotic diversity of adjacent areas or to preserve Lake Cronin and its catchment. They recommend that extending the reserve is a conservation priority. How et al (1988) also note that they consider that the landform units made up of the Ironcap Hills, their definition of the Forrestania greenstone

belt and the broad valley landform unit that they described are a priority for capture within the conservation reserve system.

Gibson (2004) has observed that the community types that occur on the banded ironstone (BIF) and laterite outcrops of the Forrestania greenstone belt (most significantly the North, Middle and South Ironcaps and Hatter Hill) were not restricted [as was suggested by Newbey and Hnatiuk 1988] to particular outcrops but widespread between Middle Ironcap in the north of his survey area and Hatter Hill in the south of his survey area. Gibson (2004) does however note that his study supports the observation [by Newbey and Hnatiuk 1988] that the vegetation and flora of these BIFs and laterite outcrops differs widely from the nearest other BIF ranges. Gibson (2004) recommends that there is an urgent need for a series of nature reserves along the Forrestania belt [to protect the vegetation and flora of ironstone formations].

The establishment recently of a series of Priority Ecological Community (PEC) boundaries over the Ironcap Hills vegetation complexes is probably the first step towards achieving a statutory level of protection (e.g. a Nature Reserve) at some point in the future. Threatened and Priority Ecological Communities are discussed further in Section 4.6.8.

Botanica (2010) note that none of the nine vegetation groups noted in their survey were considered by them to be of regional environmental significance.

4.7 Flora and Fauna

4.7.1 Flora and Fauna values and regional significance

The south western boundary corner of the Lake Cronin A-class Nature Reserve is located approximately 11 kms to the north of the northern end of the Proposal area. The Lake Cronin A Class Nature Reserve and a buffer area of 10kms surrounding the Lake is included on the Register of the National Estate as the "*Lake Cronin Area*".

According to the Australian Heritage Places Inventory (2011) the Lake Cronin Area:
"*is one of a number of areas in the wheatbelt region that are significant for rare species, due to widespread clearing in the surrounding landscape, and to the high diversity and level of local endemism. Two species are listed as vulnerable at the national level: the Malleefowl, and a eucalypt Eucalyptus steedmanii. Other species listed as Priority species at the State level include the Western Rosella (Platycercus icterotis), and another species of eucalypt E. exigua."*

The Australian Heritage Places Inventory (2011) further notes that:
"Lake Cronin Area has a high number of species that are disjunct. Disjunct populations are those that have become physically separated, resulting in minimal or no gene flow between them, and they are an important precursor to the development of new species. A number of species in Australia have separate eastern and western populations, and some have formed sub-species, reflecting important broader long-term processes such as sea level changes and climatic fluctuations".

4.7.2 Flora of conservation significance occurrence

There were no species of Threatened flora noted within the Proposal area by Botanica (2010). There were 5 species of Priority flora noted from within the Proposal area. Table 14 lists the Priority flora noted during the Botanica (2010) survey:

Table 14: Threatened and Priority flora recorded during previous flora and vegetation surveys

Genus and Species	Conservation code
Acacia singula	P3
Grevillea insignis subsp. *elliotii*	P3
Pityrodia sp. Yilgarn	P3
Stenanthemum liberum	P1
Stylidium sejunctum	P2

4.7.3 Typical flora of the Proposal area

Botanica (2010) included a plot based survey component. The main objective of the plot based survey was to define the dominant vegetation structural characteristics and determine a comprehensive species inventory for each of the major disturbance areas associated with the Proposal area. This is the primary source of information used for development of completion criteria for the flora and vegetation structural aspects of the project.

4.7.4 Seed Collection

WSA undertake an annual native seed collection program on their tenements to ensure that there is an appropriate seed bank available for use in rehabilitation. Further seed will be collected from areas adjacent to the Proposal area from suitable species listed in Botanica (2010).

4.7.5 Fauna of conservation significance occurrence

Biota Environmental Sciences (Biota) completed a Level 2 fauna survey in the vicinity of the Proposal area in November and December 2009 (Biota 2009). Threatened and priority vertebrate fauna species recorded during the survey are listed in Table 15 as follows:

Table 15: Threatened and priority fauna recorded from previous surveys within the vicinity of the Proposal area

Genus and Species	Common Name	Conservation Code
Calyptorhynchus latirostris	Carnaby's Cockatoo	T
Dasyurus geoffroii	Chuditch	T
Leipoa ocellata	Malleefowl	T
Platycercus icterotus xanthogenys	Western Rosella (Mallee)	T
Hyacola cauta whitlocki	Shy Groundwren	P4
Macropus irma	Western Brush Wallaby	P4
Oreoica gutturalis gutturalis	Crested Bellbird	P4
Pomatostomus superciliosus ashbyi	White-browed Babbler	P4

5.0 POST MINING LANDUSE AND CLOSURE OBJECTIVES

Based on the information in the closure obligations and commitments register the main closure obligations and commitments for the Proposal can be grouped into eight main categories, based on their intended closure outcomes, as follows:

5.1 Post Mining Land Use

The Proposal is located on Unallocated Crown Land (UCL) in the Shire of Kondinin. It is located east of the wheatbelt agricultural area and State Barrier Fence within the western portion of what is now termed "*The Great Western Woodlands*".

Given the relatively intact nature of the environment in the vicinity of the Proposal area and the Forrestania area in general, and given that there are a number of significant vegetation, flora and fauna values that have been identified in the general area (Section 4.6.7), the following post mining land use is proposed for the Proposal.

At the end of mining, the Spotted Quoll to Cosmic Boy haul road disturbance area will be rehabilitated to a condition that meets the closure objectives identified for the site so that it can be relinquished and returned to the area's primary long term land-use. This is currently UCL within the Great Western Woodlands.

5.2 Closure Objectives

Proposed closure objectives for the Proposal area are described in the following sections.

5.2.1 Western Australian Government Broad Closure Objective

The broad closure objective for mining operations in Western Australia is defined by DMP and EPA (2011) as follows:

"As a general guide, the Government's broad closure objectives are (physically) safe to humans and animals, (geo-technically) stable, (geo-chemically) non-polluting, and capable of sustaining an agreed post mining land use. Any residual liabilities relating to the agreed land use must be identified and agreed to by the key stakeholders."

The overall mine decommissioning and closure objective for the Proposal area is to achieve this outcome. This overall objective can be broken down into smaller more defined objectives that can be used to help guide the process.

5.2.2 Defined closure objectives

The following defined closure objectives have been proposed to address closure outcomes for key environmental aspects of the Proposal. These have been developed to aid in guiding decommissioning, rehabilitation and closure to an end point that will meet closure obligations and commitments and the expectations and aspirations (as far as is practicable) of identified

stakeholders. Objectives have been numbered sequentially to enable reference later in the document.

(1) Landscape safety

(a) Return the Proposal area to a condition that is safe for both humans and the environment on closure and following abandonment.

(2) Landscape contamination

(a) No significant contamination or risk of contamination to the existing environment adjacent to the Proposal area.

(3) Landscape design

Rehabilitated landforms are stable, non-polluting and compatible with the surrounding landscape.

(4) Landscape function

(a) Rehabilitated sites and landforms that are stable, non-polluting and capable of supporting a self-sustaining native vegetation community.

(3) Biodiversity

(a) Revegetation results that are self-sustaining and consistent with the structure and function of similar vegetation groups in the area.

(b) No features remain that could encourage the survival and proliferation of feral animal species over and above native species.

(4) Conservation

(a) Rehabilitation and revegetation results that work to encourage Carnaby's Black Cockatoo back into the area.

(5) Aesthetic

(a) Rehabilitation and revegetation results that are aesthetically compatible with the immediate and surrounding landscape.

(6) Legal

(a) A low risk of occurrence of significant breaches of legal obligations and commitments following closure of the site.

These broad outcome goals will help form the basis of the completion criteria that are developed for the Proposal. Completion criteria will be discussed in Section 8 of this report.

6.0 IDENTIFICATION AND MANAGEMENT OF CLOSURE ISSUES AND RISKS

6.1 Closure Issue Identification and Risk Assessment

Closure issues have been determined through a desktop review of the information known about the operational aspects of the site to date, the information that has been collected to date and ad hoc (i.e. brainstorming) and checklist methods described by Westman (1985).

For identified issues, a risk assessment has been undertaken to assess those that could impact on the successful achievement of mine closure objectives. Risks have been assessed in a manner consistent with Standards Australia (2006), where a measure of the consequence and likelihood of undesirable impacts occurring that could affect mine closure outcomes are assessed with the currently applicable control actions for the risk in place. Tables 16 and 17 show the Consequence and Likelihood descriptions. Tables 18 and 19 show the Risk Analysis Matrix and the Priorities descriptions. Table 20 shows the Risk Assessment Matrix and results.

Table 16: Level of consequence descriptions

Level	Descriptor	Financial Impact	Project Performance	Community/Media/Government
5	**Critical**	>$15M	Death, toxic release off-site with detrimental effect, huge financial loss. *Major hydrocarbon spill to a land area with extensive surface and water pollution.*	Serious public or media outcry
4	**Major**	$1.5M - $15M	Extensive injuries, loss of production capability, off-site release contained with outside assistance and little detrimental impact, major financial loss	Significant adverse national media / public attention
3	**Moderate**	$150K - $1.5M	Medical treatment required, onsite release contained with outside assistance, high financial loss. *Groundwater pollution with limited biological damage and no contamination of a potentially usable groundwater resource.*	Attention from media and / or heightened concern from community
2	**Minor**	$15K - $150K	First aid treatment, on-site release immediately contained, medium financial loss. *Minor hydrocarbon spills from vehicles and equipment.*	Minor, adverse local public or media attention and complaints
1	**Low**	$0 - $15K	No injuries, low financial loss, negligible environmental impact. *Erosion control structures not constructed along pipeline access road.*	Public concern restricted to local complaints

Table 17: Level of likelihood descriptions

Level	Descriptor	Description	Example
A	Almost Certain	Could be expected to occur more than once during the Study or Project delivery	Occurs once a week
B	Likely	Could easily be incurred and has generally occurred in similar studies or projects.	Occurs once a month
C	Possible	Incurred in a minority of similar Studies or Projects	Occurs once every year
D	Unlikely	Known to happen but only rarely	Occurs once every 10 years
E	Rare	Conceivable, but only in extreme circumstances	Occurs once every 100 years

Table 18: Risk Analysis Matrix

	Consequence				
Likelihood	Low (1)	Minor (2)	Moderate (3)	Major (4)	Critical (5)
Almost Certain (A)	High (16)	High (11)	Extreme (8)	Extreme (3)	Extreme (1)
Likely (B)	Moderate (21)	High (15)	High (10)	Extreme (5)	Extreme (2)
Possible (C)	Low (22)	Moderate (18)	High (13)	Extreme (9)	Extreme (4)
Unlikely (D)	Low (24)	Low (20)	Moderate (17)	High (12)	Extreme (6)
Rare (E)	Low (25)	Low (23)	Moderate (19)	High (14)	High (7)

Table 19: Risk Level Action Priorities

Risk Level	Priority	Example Action
Extreme	1	Cease activity or task; detailed research and planning required
High	2	Senior management attention; immediate corrective and preventative action required
Moderate	3	Management responsibility assigned; corrective and preventative action plan developed
Low	4	Manage by routine procedures; accept risk

Table 20: Risk Assessment Matrix – Closure Issues

Closure Domain/Area	Closure Risk	Cause(s)	Impact	Existing/proposed control	Consequence	Likelihood	Risk Level
Roads and Tracks – Haul Road	Restriction of natural drainage flows.	Blocked culverts.	Increase in flooding. Alteration of natural drainage flows. Potential impact to vegetation.	Removal of culverts and reinstatement of natural drainage channel flow paths.	2	D	Low (20)
	Compaction.	Heavy and light vehicle traffic over extended periods.	Poor rehabilitation results. Increased runoff.	Raised road surfaces to be levelled and the area contoured and deep ripped.	2	D	Low (20)
	Erosion.	Steep road side batters or other steep road sections left in situ.	Poor rehabilitation. Siltation and deterioration of adjacent vegetation.	Batter slope angles down to match with those in adjacent areas. Respread cleared vegetation over rehabilitated surfaces. Install contour erosion banks along length of road to reduce water flows.	2	C	Moderate (18)
	Dust impact to surrounding vegetation.	Poor dust management during operation.	Deterioration and death of vegetation heath. Increased closure liability.	Regular dust suppression road water application.	2	C	Moderate (18)
	Highly saline soil surface layer along haul road.	Application of saline dust suppression road water.	Poor rehabilitation results.	Remove sheeting and subgrade material and bury in a suitable location.	2	C	Moderate (18)
	Contaminated water runoff impacting surrounding soil and vegetation.	Application of saline dust suppression road water to road surface.	Deterioration and death of road side vegetation. Increased closure liability.	Install road side drains to prevent runoff into adjacent bush during rehabilitation. Re-contouring and deep ripping asap after closure.	2	D	Low (20)
	Saline water drift impact to surrounding soil, vegetation and topsoil stockpiles.	Saline dust suppression water released at high pressure.	Deterioration and death of road side vegetation. Increased closure liability.	Use of dribble bars to minimise saline drift during haul road operation.	2	C	Moderate (18)

	Weed establishment	Poor vehicle and machinery hygiene, infestation of disturbed areas from local populations	Reduced rehabilitation success, reduced biodiversity values, ongoing legacy	Ensure vehicles entering and exiting site remain on established tracks, ensure ground engaging machinery is clean prior to entering the site to work. Regular monitoring and eradication program.	2	C	Moderate (18)
	Unplanned access to rehabilitated sites by third parties.	Access deterrents not adequately considered.	Damage to revegetation. Safety concerns.	Install appropriate signage and restrictive bunds or other access barriers at strategic entry points to Haul Road.	1	C	Low (22)
Corporate	Unexpected extended closure of operation.	WSA hits financial trouble, mine becomes unprofitable.	Site rehabilitation left unfinished, deterioration of mine landforms and infrastructure, liability to state	Progressive rehabilitation when opportunities arise. Rehabilitation resources available. Financial resources set aside to cover rehabilitation costs as a part of project budgets. Company/Projects subject to regular financial auditing.	4	E	High (14)
Corporate	Lack of financial resources to undertake and complete full decommissioning and closure.	No financial resources set aside while mine operational and profitable.	Site rehabilitation left unfinished, deterioration of mine landforms and infrastructure, liability to state.	Progressive rehabilitation when opportunities arise. Financial resources set aside to cover rehabilitation costs as a part of project budgets. Company/Projects subject to regular financial auditing.	4	E	High (14)

6.2 Closure Issue Risk Priorities

The results of the risk assessment indicate that there are a two high risk issues that despite control actions being implemented, could potentially be a problem for mine closure in terms of management and cost if they are not appropriately assessed, managed and allowed for in closure planning. Table 21 lists these in order of priority.

Table 21: High Risk Issue Priority

Closure Domain	Closure Risk	Risk Priority
Corporate	Unexpected extended closure of operation.	High (14)
Corporate	Lack of financial resources to undertake and complete full decommissioning and closure.	High (14)

7.0 COMPLETION CRITERIA

DMP (2011) note that "*Completion criteria are necessary to provide the basis on which successful rehabilitation and mine closure, and achievements of closure objectives are determined*".

EPA (2006) recommends that some distinction between both the landscape functional values and biodiversity values of a site needs to be made and further recommends that completion criteria reflect rehabilitation progress towards agreed outcomes on both levels.

In line with these requirements, interim closure criteria including KPIs have been developed to best meet the current closure objectives listed in Section 6.2.2. KPIs and Completion Criteria have been numbered sequentially for reference in later Sections of the document.

7.1 Completion criteria – landscape safety

One of the key objectives of mine closure is to leave an abandoned mine site in a condition that does not pose a safety hazard to the public or to the environment. To ensure that this is achieved the following KPI's and completion criteria are proposed.

KPIs

(1) Safety audit for Proposal area at decommissioning stage prior to and post rehabilitation earthworks.

Completion criteria

(1) Proposal area passes safety audit.
Eg. Appropriate closure safety signage in place. Steep slopes battered down to minimise safety hazard. Access barriers in place to restrict vehicle access.

7.2 Completion criteria –landscape contamination

Contamination of rehabilitated sites can impact on landscape function in that it can limit the success of rehabilitation and contribute to environmental harm. Monitoring and management of contaminated sites and pollution need to be considered as a part of the overall landscape function of the site.

KPIs

(2) Sampling for EC, pH, TPH and full metals analysis at sites adjacent to Proposal area and assessment against *"Assessment levels for Soil, Sediment and Water"* published by the Department of Environment and Conservation in February 2010

Completion criteria

(2) Suspected contaminated sites (identified through sampling) within the Proposal area are managed in line with the requirements of the *Contaminated Sites Act 2003*, so that at closure there are no significant contaminated or polluted sites remaining that could breach closure conditions and commitments.

Note: Where contaminated sites are suspected, through observation or sampling results, then these will need to be reported to the contaminated sites branch of DEC in line within statutory timeframes.

7.3 Completion criteria – landscape design

The design of rehabilitation earthworks is an important consideration in creating rehabilitated landforms that are safe, stable and non-polluting. The following KPIs and Completion Criteria are proposed.

KPIs

(3) Rehabilitation earthworks completed to a design that will facilitate establishment of revegetation and compliance with other KPIs and completion criteria.

Completion Criteria

(3) Rehabilitation earthworks work to meet design criteria as follows:

- Review and incorporate results of Safety Audit where applicable.
- Remove all infrastructure associated with Proposal.
- Remove haul road sheeting and subgrade material and dispose of in Spotted Quoll open pit.
- Remove culverts and reinstate drainage lines along length of haul road.
- Re-contour all batters and slopes to an angle of 4:1 (14 degrees) or less; or to a level that is compatible with the surrounding landscape.
- Re-spread topsoil across surface to a depth of ~100 – 200 mm.
- Deep rip along contour (where possible) to alleviate compaction.
- Re-spread cleared vegetation.
- Direct seed and fertilise immediately following completion of earthworks.

7.4 Completion criteria – landscape function

Returning functionality to the landscape following decommissioning and is a key objective of rehabilitation. To ensure functionality is returned the following KPIs and Completion Criteria are proposed.

KPIs

(4) In terms of assessing landscape function, the primary KPIs that will be used to assess progress towards closure objectives are based on the Landscape Function Analysis (LFA) methodology of Tongway and Hindley (2004) as follows:

- Surface stability;
- Infiltration/runoff;
- Nutrient cycling status; and
- Vegetation dynamics.

Comparison of theses KPIs will be made with those of suitable analogue (control sites) located in nominated locations within or adjacent to the Proposal area. KPI results will be tracked to determine if they are progressing towards the KPIs shown by the analogue site.

Completion Criteria

(4) When a significant long term (eg. 3 – 5 years) positive trend in progression towards the KPI values shown by the analogue site(s) can be seen then it is proposed that the rehabilitation can be considered complete for the purposes of landscape function.

7.5 Completion criteria – biodiversity

For the general Proposal area, three master revegetation seed species treatment lists are proposed for use in assessing completion criteria as follows:

- A combined *Eucalyptus* mallee woodland list.
- A combined *Eucalyptus* woodland list.
- A scrub heath list.

It is considered that these three groups broadly reflect the two main Beard vegetation formations (i.e. Woodland: Salmon gum and morrell and Shrublands: scrub heath) occurring within the Proposal area. Species to be included should have potential to be able to produce the vegetation structural characteristics from these vegetation groups and be from family/genus groups that are known to produce results in rehabilitation. This will enable much greater flexibility in the definition of what is an acceptable completion outcome, as it is likely to capture most of the possible vegetation groups that could be generated from topsoil and seed.

Seed mixes will be applied at a rate of 5kg/ha and will be treated using smoke and/or scarification as applicable to break dormancy.

A plan showing the applicability of these proposed seed mix treatment lists in relation to the Proposal area is shown in Figure 4, Section 11.

KPIs

(5) Biodiversity monitoring for the following parameters:

- Identifiable strata (as relevant to vegetation group).
- Measurement of % Foliage cover (native) for each stratum identified.
- Species richness.
- Measurement of % Foliage cover (weeds) if identified.

It is proposed that a number of 20m x 20m quadrats (consistent with original plot survey quadrat size) be set up within rehabilitated sites in combination with LFA transects to sample for these indicators.

Completion Criteria

(5) Vegetation structural trends that are progressing towards the typical stratum height characteristics expected of the target vegetation group (Table 22).

(6) Typical growth forms for each stratum that are progressing towards the typical range of values show for the target vegetation group (Table 22).
(7) % Foliage cover (native) value trends for each stratum that are progressing towards the typical range of values shown for the target vegetation group (Table 22).
(8) A species richness of 60% of the species listed in the interim species treatment lists for each vegetation group (Table 23).
(9) % Foliage cover (weeds) of <5%.

*Note: It is proposed that the interim species lists included here are live and should be edited throughout the life of the project in line with the results of the provenance seed collection program. Seed availability and quantities may vary considerably from year to year leading to a need for alternative species to be included.

Table 22: Typical stratum, height, growth form and crown cover values

Vegetation group	Typical stratum characteristic expected	Typical height of each stratum (m)	Typical growth form for each stratum	Typical % crown cover for each stratum
Eucalyptus woodland.	Upper stratum: Mid stratum: Ground stratum:	3 – 12 1 – 3 0.25 – 1	Tree Shrub Shrub	10 – 70 30 – 70 10 – 70
Eucalyptus mallee woodland.	Upper stratum: Mid stratum: Ground stratum:	3 – 6 1 – 3 0.25 – 1	Shrub mallee, shrub Shrub Shrub	10 – 30 30 – 70 30 – 70
Scrub heath.	Upper stratum: Mid stratum: Ground stratum:	1 – 3 0.5 – 1 0.25 – 0.5	Shrub mallee, heath Shrub Shrub, heath shrub Heath shrub	1 – 70 10 – 70 30 – 70

Table 23: Species treatment lists for each vegetation group

Family	Genus and Species	Eucalyptus woodland	Eucalyptus mallee woodland	Scrub heath	Stratum Emergent/Upper/ Mid/ Ground
Asteraceae	*Olearia muelleri*	X	X		Mid
	Allocasuarina campestris	X	X	X	Mid, Upper
	Allocasuarina corniculata			X	Upper
Chenopodaceae	*Atriplex stipitata*	X			Ground
	Atriplex vesicaria	X			Ground
	Scelerolaena diacantha	X			Ground
	Sclerolaena uniflora	X			Ground
Convolvulaceae	*Wilsonia humilis*	X	X		Ground
Cupressaceae	*Callitris preisii*	X	X		Mid
Fabaceae	*Acacia erinacea*	X		X	Ground
	Acacia fragilis	X	X	X	Mid
	Acacia hemiteles	X			Mid
	Acacia intricata	X			Ground
	Acacia merrallii	X	X	X	Mid, Upper
	Acacia poliochroa	X			Ground
	Acacia steedmanii subsp. *steedmanii*		X	X	Mid
	Acacia uncinella		X		Mid
Fabaceae	*Daviesia benthamii* subsp. *acanthoclona*	X		X	Mid, Ground
	Daviesia benthamii subsp. *benthamii*	X	X	X	Mid, Ground
	Daviesia nematophylla	X		X	Mid
	Gastrolobium spinosum			X	Mid
Hemerocallidaceae	*Dianella revoluta*	X		X	Ground

Family	Genus and Species	Eucalyptus woodland	Eucalyptus mallee woodland	Scrub heath	Stratum Emergent/Upper/ Mid/ Ground
Myrtaceae	*Beaufortia interstans*			X	Ground
	Beaufortia schaueri			X	Ground
	Eucalyptus calycogona subsp. *calycogona*		X		Upper
	Eucalyptus cylindrocarpa	X	X		Mid
	Eucalyptus eremophila subsp. *eremophila*	X	X	X	Mid, Upper
	Eucalyptus pileata		X		Upper
	Eucalyptus salmonophloia	X	X		Upper, Emergent
	Eucalyptus salubris	X	X		Upper
	Eucalyptus urna	X	X		Upper
	Leptospermum erubescens	X	X	X	Mid, Upper
	Melaleuca adnata	X	X	X	Mid
	Melaleuca cordata		X	X	Mid, Upper
	Melaleuca cucullata	X	X		Mid
	Melaleuca glaberrima			X	Mid
	Melaeuca hamata	X	X	X	Mid, Upper
	Melaleuca lateriflora subsp. *lateriflora*	X	X		Mid
	Melaleuca laxiflora	X	X		Mid
	Melaleuca pauperiflora subsp. *fastigiata*	X	X		Mid, Upper
	Melaleuca pauperiflora subsp. *pauperiflora*	X	X	X	Mid
	Thryptomene kochii		X		Mid
Proteaceae	*Banksia cirsioides*			X	Mid

Family	Genus and Species	Eucalyptus woodland	Eucalyptus mallee woodland	Scrub heath	Stratum Emergent/Upper/ Mid/ Ground
Proteaceae	*Banksia elderiana*			X	Upper
	Grevillea huegelii	X	X		Mid
	Grevillea oncogyne	X	X	X	Ground, Mid
	Hakea corymbosa			X	Mid
	Hakea multilineata		X	X	Upper
	Hakea scoparia subsp. *scoparia*		X		Upper
Rhamnaceae	*Cryptandra minutifolia* subsp. *minutifolia*	X	X	X	Ground
Santalaceae	*Santalum acuminatum*	X			Mid
Sapindaceae	*Dodonaea bursariifolia*	X			Mid
	Dodonaea microzyga var. *acrobalata*	X			Mid
	Dodonaea stenozyga	X	X		Mid

7.6 Completion criteria – conservation

Approximately 6.45 ha of potential breeding habitat for the Threatened Fauna species *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo) will be impacted by the Proposal (Figure 5, Section 11). In the FNP area, *E. salmonophloia* (Salmon Gum) is the tree species preferred by the Carnaby's Black Cockatoo for breeding. At closure, additional rehabilitation activities will include the planting of *Eucalyptus salmonophloia* seedlings to this area

KPIs

(6) Establishment and survival of suitable breeding habitat trees within the 6.45 ha of potential Carnaby's habitat affected by the Proposal.

Completion criteria

(10) Replant *E. salmonophloia* tree seedlings at a rate of 500 trees/ha within the 6.45 ha potential breeding habitat area. Total tree seedlings to be planted 3225 with one seedling every 20m^2. Seedlings to be planted into rip lines.
(11) Survival of >80% (2580) *E. salmonophloia* tree seedlings within the 6.45 ha area, 2 years post mine closure.
(12) Where *E. salmonophloia* survival rates fall below 80% at 2 years post closure, all seedlings that have died will be replaced.

7.7 Completion criteria – aesthetic

It is important at closure that rehabilitated areas are aesthetically pleasing and are trending towards a resemblance to the surrounding environment.

KPIs

(7) Rehabilitation and revegetation progressing towards completion criteria for landscape function and biodiversity.
(8) Post closure batter angles are compatible with the surrounding landscape.

Completion criteria

(13) Removal of all infrastructure associated with the Proposal.
(14) Revegetation showing structure and composition that meets completion criteria for landscape function, biodiversity and conservation.
(15) Final landforms meet KPI (13).

7.8 Completion criteria – legal

The legal obligations and commitments register in Section 3 lists the obligations and commitments that must be met by WSA in order for the site to be signed off as closed by regulatory agencies.

KPIs

(9) Legal obligations and commitments register

Completion criteria

(16) Compliance with legal obligations and commitments register.

8.0 CLOSURE IMPLEMENTATION

As indicated in Section 6, the proposed post mining land-use for the Proposal area is a return to UCL within the Great Western Woodlands, in a condition that is consistent with the identified closure objectives for the site and with the open pit and waste remaining as post closure landforms. Interim completion criteria have been developed in Section 8.

In order to achieve this end land use in a structured and progressive manner, the site has been broken down into sub-domains which can be specifically targeted with achievable closure criteria. Table 24 lists the main domains and sub-domains identified for the Proposal area.

Table 24: Domains and sub-domains closure status 2011-2012

Closure domain	Sub-domain	Current Status	Area (~ha plan view)	Rehabilitation completed current year (ha)	Rehabilitated previously (ha)	Rehabilitation total to date (ha)	Approximate closure date
Roads and tracks	Haul roads	Active	35.01	0	0	0	at least 2020
	Gravel pits	Active	3.0	0	0	0	at least 2020
	Topsoil stockpiles	Active	2.9	0	0	0	at least 2020
	Vegetation stockpiles	Active	0.21	0	0	0	at least 2020
Total			**41.12**	**0**	**0**	**0**	

A summary closure actions plan for the Proposal is provided in Table 25. This will be updated regularly to incorporate any changes to the CCP.

Table 26 provides a summary of closure objectives, KPIs and completion criteria for the Proposal and should be used in conjunction with Table 25.

Table 25: Summary Closure Action Plan Roads and Tracks Domain

Roads and Tracks Domain Expected Closure Date: At least 2020

Status 2011-2012: Planning/approvals stage

High/Extreme closure risks summary

- Unexpected extended closure of operation.
- Lack of financial resources to undertake and complete full decommissioning and closure.

Rehabilitation trials summary: 2011 – 2012

- nil

Closure Monitoring and testwork summary: 2011 – 2012:

- nil

Rehabilitation actions summary upon closure

- Review and incorporate results of Safety Audit where applicable.
- Investigation and assessment of site and site materials for evidence of contamination and pollution in line with (DEC 2010).
- Implement actions to remove, remediate or otherwise make safe contaminated and polluted sites and materials as required to meet project conditions and commitments and statutory obligations.
- Remove all infrastructure (where relevant depending on the status of the project).
- Remove sheeting and subgrade material and bury in Spotted Quoll open pit.
- Remove culverts and reinstate drainage.
- Reduce batter slopes and steep road sections generally to 4:1 (14 degrees) or less; or to a level that is compatible with the surrounding landscape with slopes similar those pre-existing at the site.
- Spread topsoil material to the surface at ~100 – 200 mm depth.
- Deep rip on contour where possible.
- Respread cleared vegetation/mulch over surface.
- Direct seed and fertilise. Seed mixes to be sown at 5kg/ha.
- Plant *E. salmonophloia* seedlings at a density of 1 per 20 m^2 to 6.45 ha area considered to be potential Carnaby's Cockatoo breeding habitat (Figure 5). Seedlings to be planted into rip lines.
- Monitor indicators and assess trends against Closure Objectives, KPIs and Completion Criteria.
- Undertake remedial actions in line with outcomes of audits and monitoring.

Proposed rehabilitation actions: 2011 – 2012

- N/A

Applicable Objectives, KPIs, completion criteria and management plan summary 2011-2012

Sub – domains	**Closure objectives** Table 26	**Closure KPIs** Table 26	**Completion criteria** Table 26
Haul road	1-7	1-9	1-16
Gravel pits			
Topsoil laybys			
Vegetation storage			

Table 26: Closure objective, KPIs and completion criteria summary

Closure Objective	KPIs	Completion Criteria
(1) Landscape safety (a) Return the Proposal area to a condition that is safe for both humans and the environment on closure and following abandonment.	(1) Safety audit for Proposal area at decommissioning stage prior to and post rehabilitation earthworks.	(1) Proposal area passes safety audit: eg. Appropriate safety signage in place; Steep slopes battered down to minimise safety hazard; Access barriers in place to restrict vehicle access.
(2) Landscape contamination (a) No significant contamination or risk of contamination to the existing environment adjacent to the Proposal area.	(2) Sampling for EC, pH, TPH and full metals analysis at sites adjacent to Proposal area and assessment against "*Assessment levels for Soil, Sediment and Water*" published by the Department of Environment and Conservation in February 2010.	(2) Suspected contaminated sites (identified through sampling) within the Proposal area are managed in line with the requirements of the *Contaminated Sites Act 2003*, so that at closure there are no significant contaminated or polluted sites remaining that could breach closure conditions and commitments.
(3) Landscape design (a) Rehabilitated landforms are stable, non-polluting and compatible with the surrounding landscape.	(3) Rehabilitation earthworks completed to a design that will facilitate establishment of revegetation and compliance with other KPIs and completion criteria.	(3) Rehabilitation earthworks design as follows. • Review and incorporate results of Safety Audit where applicable. • Remove all infrastructure associated with Proposal. • Remove haul road sheeting and subgrade material and dispose of in Spotted Quoll open pit. • Remove culverts and reinstate drainage lines along length of haul road. • Re-contour all batters and slopes to an angle of 4:1 (14 degrees) or less; or to a level that is compatible with the surrounding landscape. • Re-spread topsoil across surface to a depth of ~100 – 200 mm. • Deep rip along contour (where possible) to alleviate compaction. • Re-spread cleared vegetation. • Direct seed and fertilise immediately following completion of earthworks.

(2) Landscape function (a) Rehabilitated sites and landforms that are stable, non-polluting and capable of supporting a self-sustaining native vegetation community.	(4) Landscape Function Analysis (LFA) monitoring for the following parameters: • Surface stability • Infiltration/runoff. • Nutrient cycling status. • Vegetation dynamics.	(4) When a significant long term (eg. 3 – 5 years) positive trend in progression towards the LFA KPI values shown by the analogue site(s) can be seen then it is proposed that the rehabilitation can be considered complete for the purposes of landscape function.
(4) Biodiversity (a) Revegetation results that are self-sustaining and consistent with the structure and function of similar vegetation groups in the area.	(5) Biodiversity monitoring for the following parameters in conjunction with LFA. • Identification of relevant vegetation strata. • Measurement of % Foliage cover (native) for each stratum identified. • Species richness. • Measurement of % Foliage cover (weeds) if identified.	(5) Vegetation structural trends that are progressing towards the typical stratum height characteristics expected of the target vegetation group (Table 24). (6) Typical growth forms for each stratum that are progressing towards the typical range of values show for the target vegetation group (Table 24). (7) % Foliage cover (native) value trends for each stratum that are progressing towards the typical range of values shown for the target vegetation group (Table 24). (8) A species richness of 60% of the species listed in the interim species lists for each vegetation group (Table 25). (9) % Foliage cover (weeds) of <5%.
(5) Conservation (a) Rehabilitation and revegetation results that longer term will work to encourage Carnaby's Black Cockatoo back into the area.	(6) Establishment and survival of suitable breeding habitat trees within the 6.45 ha of potential Carnaby's habitat affected by the Proposal.	(10) Replant *E. salmonophloia* tree seedlings at a rate of 500 trees/ha within the 6.45 ha potential breeding habitat area. Total tree seedlings to be planted 3225 with one seedling every $20m^2$. (11) Survival of >80% (2580) *E. salmonophloia* tree seedlings within the 6.45 ha area at 2 years post mine closure. (12) Where *E. salmonophloia* survival rates fall below 80% at 2 years post closure, all seedlings that have died will be replaced.

(6) Aesthetic (a) Rehabilitation and revegetation results that are aesthetically compatible with the immediate and surrounding landscape.	(7) Rehabilitation and revegetation progressing towards completion criteria for landscape function and biodiversity. (8) Post closure batter angles are compatible with surrounding landscape.	(13) Removal of all infrastructure associated with the Proposal. (14) Revegetation showing structure and composition that meets completion criteria for Landscape Function, Biodiversity and Conservation. (15) Landforms battered down to meet KPI standard.
(7) Legal (a) A low risk of occurrence of significant breaches of legal obligations and commitments following closure of the site.	(9) Legal obligations and commitments register.	(16) Compliance with legal obligations and commitments register.

8.1 Unexpected or temporary closure

The risk of an unexpected or temporary closure at the Proposal was assessed as rare likelihood of occurrence but of major consequence with an overall risk profile of High. The High risk profile for this element is due to the unknown nature of such an event and the fact that there are many factors which could contribute to an unexpected or temporary closure and hence many outcomes which may have varying impacts on the company's ability to continue operating. The company is prepared for such an event in the following ways:

- Rehabilitation cost estimates are built into project budgets as liability costs in line with the most recent rehabilitation cost analysis. In the event of an unexpected closure liability funds would be available to achieve rehabilitation objectives.

- Rehabilitation resources such as topsoil and vegetation stockpiles have been set aside in quantities sufficient to complete rehabilitation of the whole site.

- A local earthmoving contracting company from Lake King completes much of the rehabilitation at the FNP. If mining machinery is demobilised offsite this resource would remain indefinitely and could be used to complete rehabilitation works.

- Should a significant event occur which leads to long term closure of the Haul Road, a skeleton crew of management and environmental personnel would remain in place to supervise and manage rehabilitation activities.

8.2 Decommissioning

Mining at FNP is currently scheduled to continue at least for the next 8-9 years. Hence decommissioning of most mine infrastructure is not expected until at least 2020.

Further details regarding the decommissioning of the site will be provided within 2 years of the date of closure (approximately 2018). This date may change however, given that it is expected that mining at FNP will continue to progress well past 2020.

9.0 CLOSURE MONITORING AND MAINTENANCE

As has been noted in previous sections, progress towards closure will be assessed against a number of Closure Objectives, KPIs and Completion Criteria. Included in these are a number of audit and monitoring activities that will continue post closure until it is agreed that the Proposal area can be signed off as complete. Audit and monitoring activities include:

- Safety audit of the site at closure.
- Sampling for contamination.
- Landscape Function Analysis.
- Biodiversity monitoring.
- Conservation seedling planting monitoring.
- Compliance auditing with Proposal implementation Conditions and Commitments.

Where these are not being met or where trends show that these are unlikely to be met, the cause(s) of the problem will be investigated and remedial actions implemented as required in order to meet any outstanding measures.

Depending on the outcomes of investigations remedial actions could include:

- Further remediation of contaminated sites.
- Re-contour and ripping batters to repair erosion.
- Re-spreading topsoil.
- Reseeding or planting.
- Application of mulch.

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11.0 FIGURES

Figure 1: Forrestania Nickel Project location within Western Australia

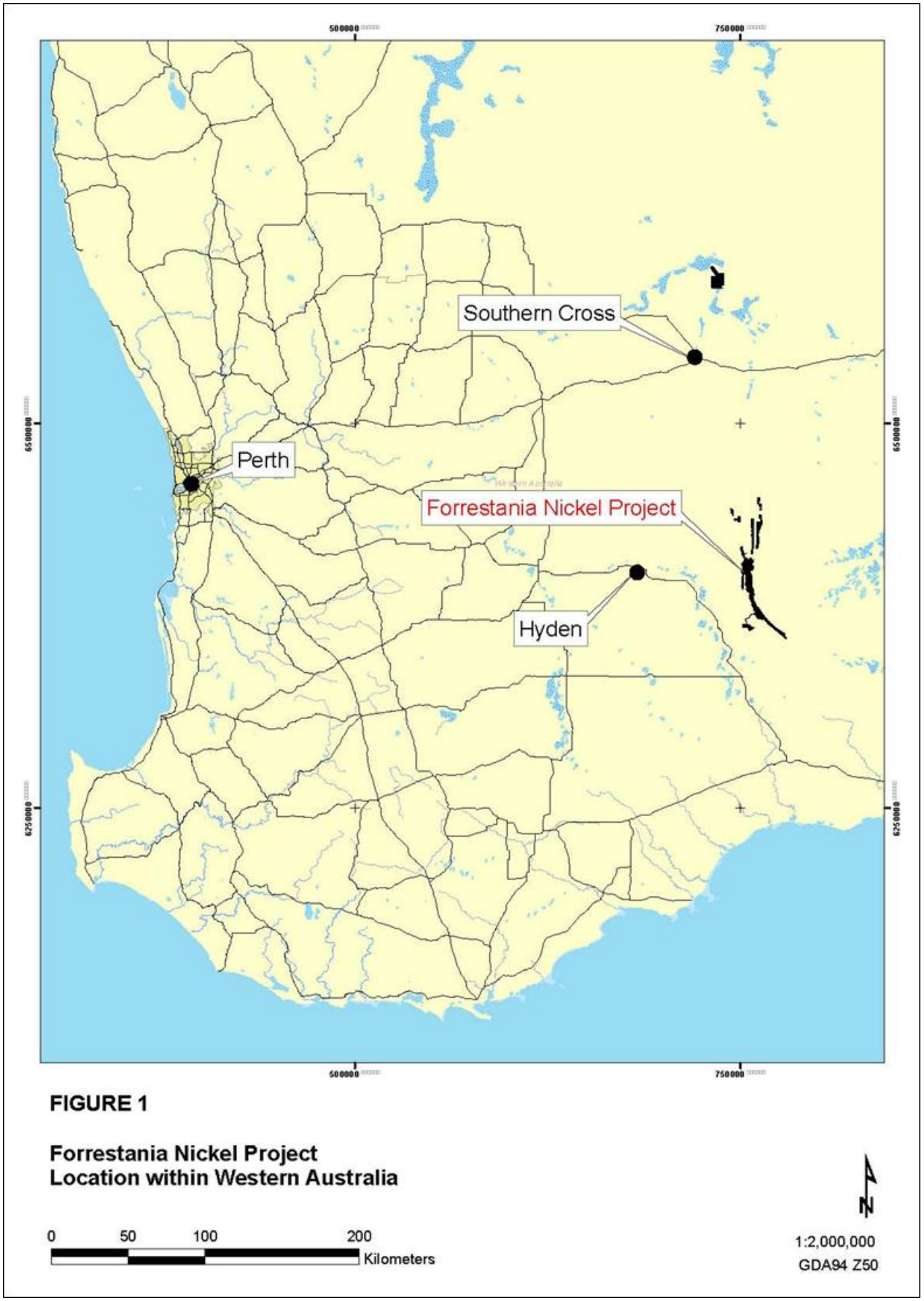


Figure 2: Western Areas NL Project area and tenure plan

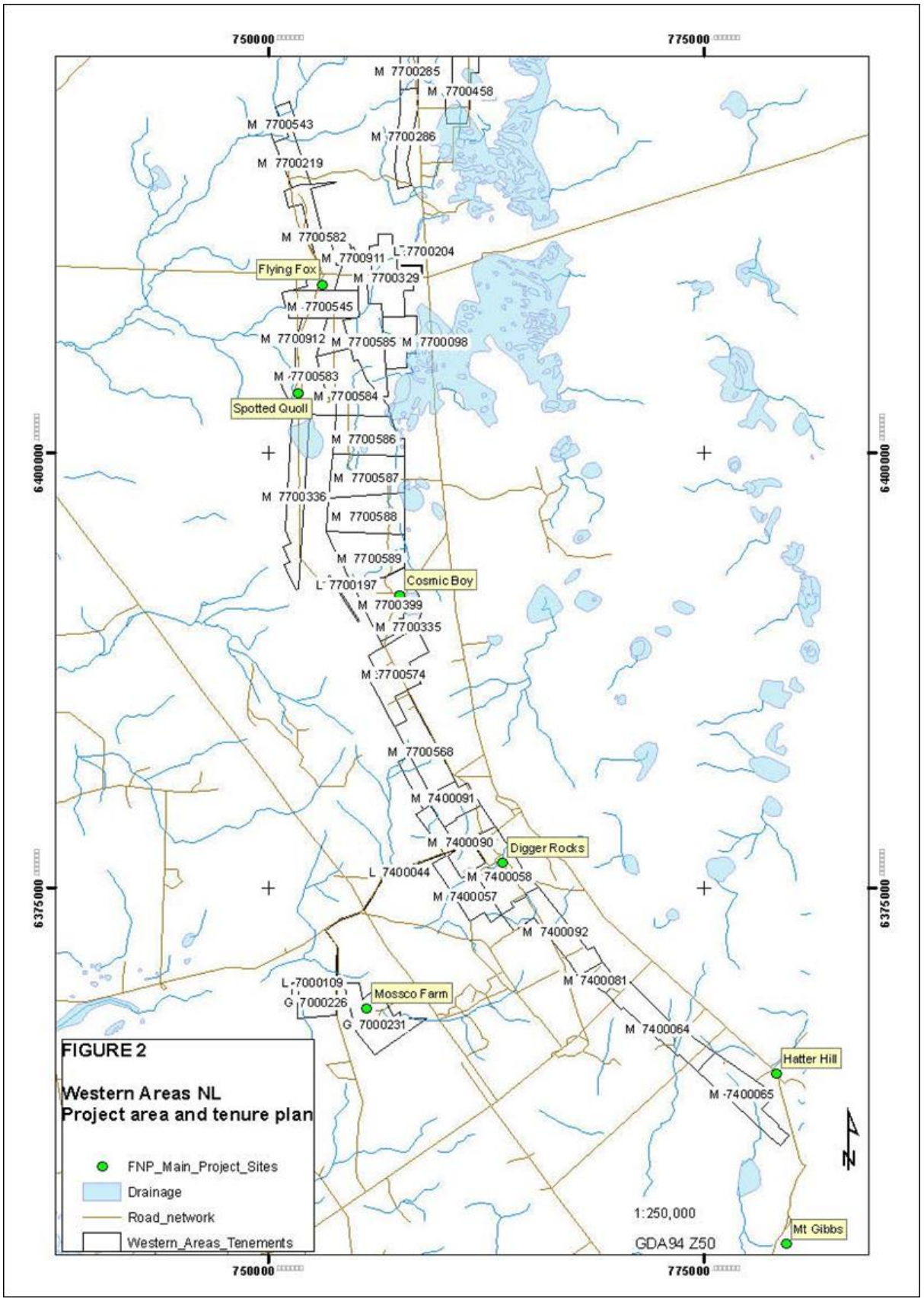


Figure 3: Sub-domains of the Proposal area

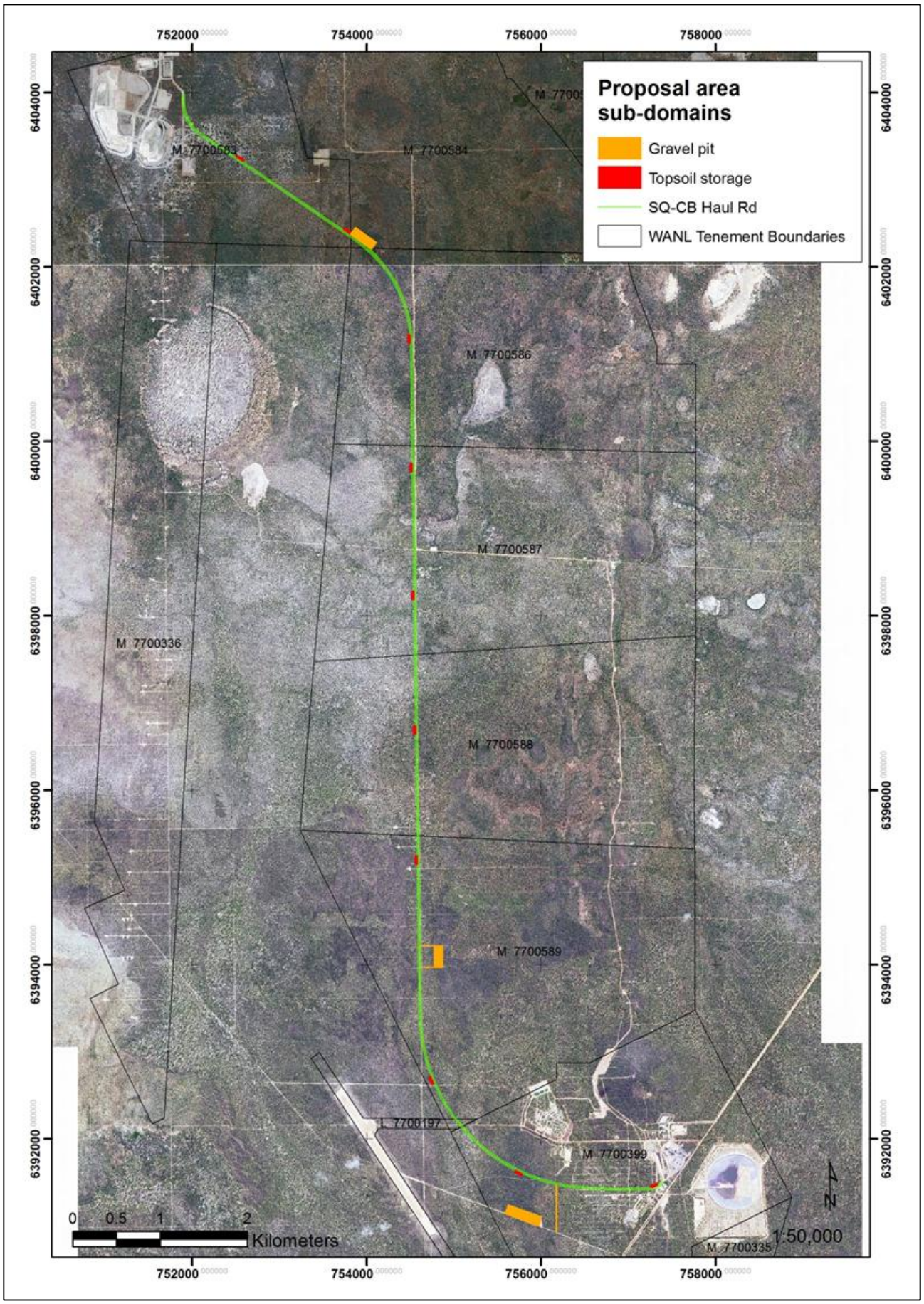


Figure 4: Proposal seed mix application areas

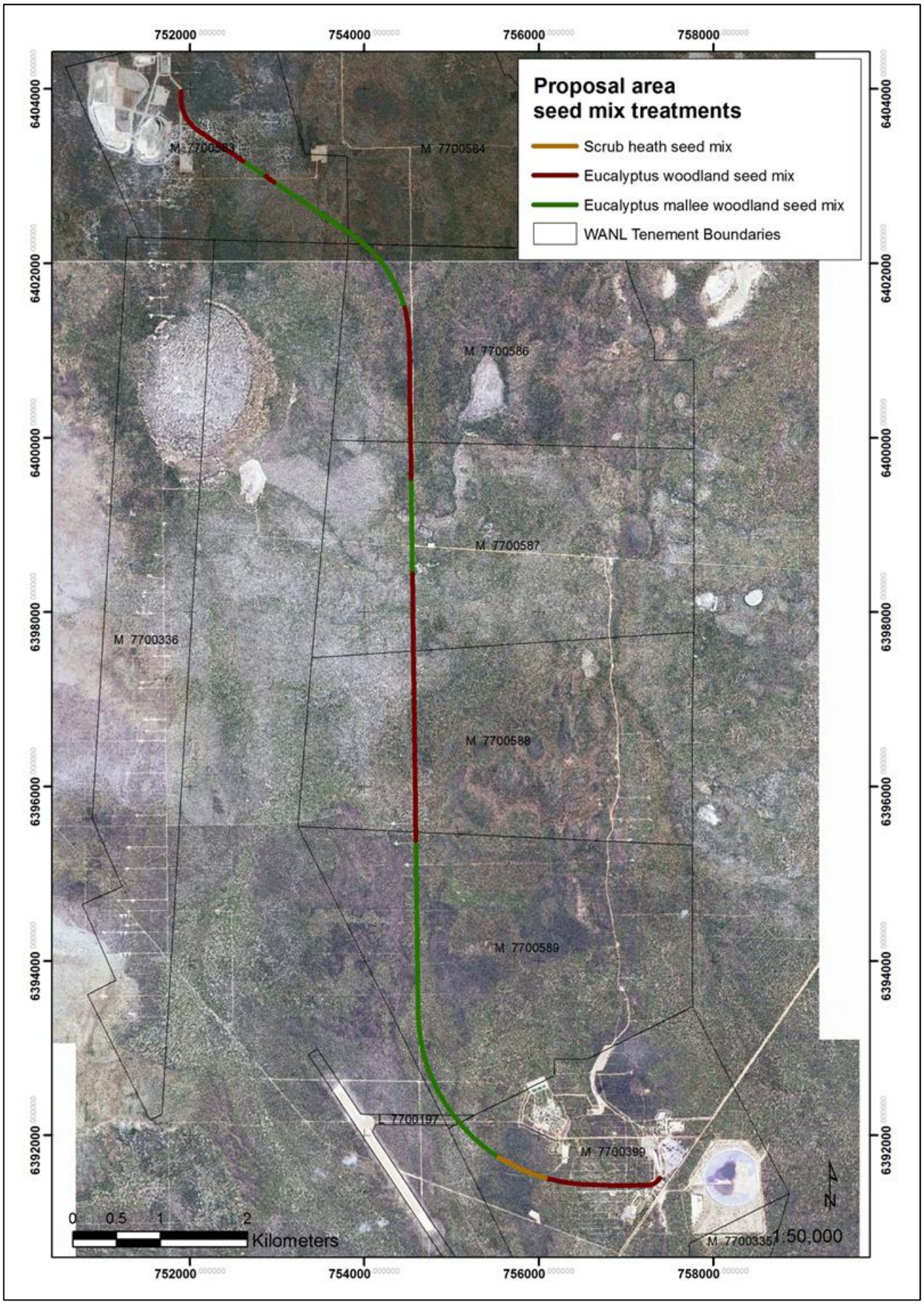
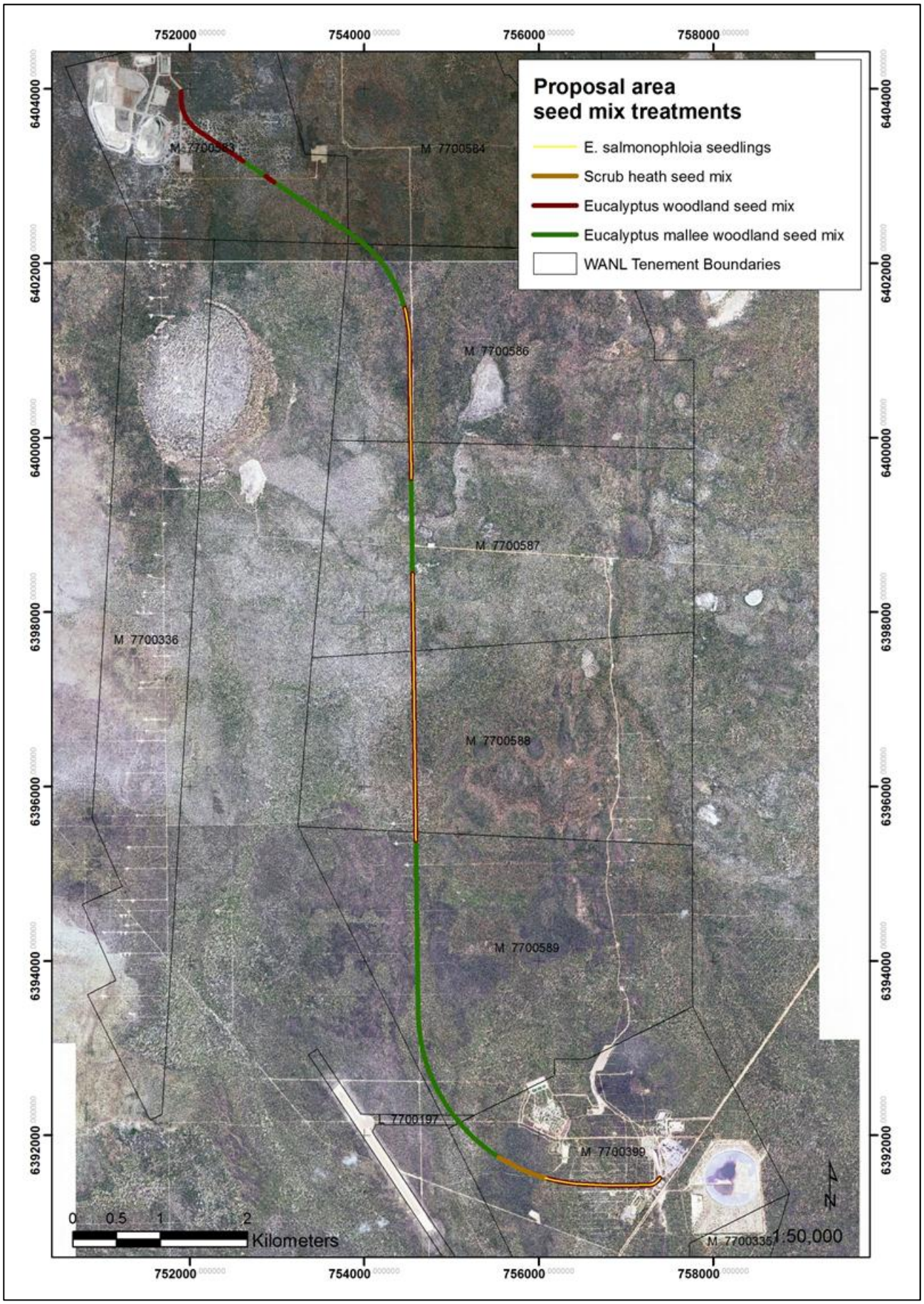


Figure 5: Carnaby's Black Cockatoo potential breeding habitat area



APPENDICES

Appendix 1: DSEWPC Approval document: Forrestania Spotted Quoll Open Pit – Cosmic Boy Haul Road, Forrestania, Nickel Project, Goldfields, WA (EPBC 2011/6003).

(refer to accompanying disc)

Appendix 2: Forrestania Nickel Project. Spotted Quoll – Cosmic Boy Haul Road. Mining Proposal. M77/399, M77/589, M77/588, M77/587, M77/586, M77/584 & M77/583.

(refer to accompanying disc)

Appendix 3: Spotted Quoll/Cosmic Boy Haul Road. Flora and Vegetation Survey.

(refer to accompanying disc)