

# **Offset Management Plan**

## **(Site Rehabilitation and Environmental Monitoring Plan)**

### H5115 Boyup Brook-Cranbrook Rd Tonebridge

Expansion of mine waste rock dump, Talison Lithium Greenbushes Operations, Greenbushes, Western Australia (EPBC 2013/6904)

Proponent: Talison Lithium Australia Pty Ltd (ACN 139 401 308)

Proposed Action: Clearance of vegetation to expand the mine waste rock dump at the Talison Lithium Greenbushes Operations, Greenbushes, Western Australia [See EPBC Act referral 2013/6904]

**Published:** November 20, 2017

**Principle Author:** Brian Chambers





## Declaration of accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed



Full name:

Stephen Green

Organisation: Talison Lithium Australia Pty Ltd

Date:

7-12-17

## Document Version Control

Version	Changes Made	Reason for change	Person responsible	Date
1			B. Chambers	4/12/16
1.1	Draft conservation covenant added in Appendix 3, DEE comments addressed	Draft covenant supplied. Comments from DEE.	B. Chambers	9/12/16
1.2	Changed timing of annual report	Variation approved by minister 7 <sup>th</sup> March 2017	B. Chambers	7/3/2016
1.3	Addition of crash grazing and prescribed burn in first year to reduce fuel loads and encourage germination of seed bank	Heavy pasture grass fuel loads observed in northern blocks	B. Chambers	20/11/2017

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# 1. Executive Summary

Talison Lithium Pty Ltd operates Australia largest lithium mine at Greenbushes in Western Australia. As part of the mine's operations a waste rock dump is being expanded, which will result in the loss of 75.7 ha of habitat for three threatened black cockatoo species (*Calyptorhynchus banksii naso*, *Calyptorhynchus latirostris* and *Calyptorhynchus baudinii*). This loss of black cockatoo habitat will be offset through an agreement reached between Talison and Tonebridge Grazing Pty Ltd (TBG) that owns a property that contains a 121.7 ha area of black cockatoo habitat that is currently under threat of continued degradation due to uncontrolled livestock grazing (the offset area). TBG have agreed to have a perpetual restrictive covenant placed over the 121.7ha of habitat which will require the area to be maintained and managed for its value as native vegetation. In order to fully offset the loss of habitat at the Greenbushes impact site the area will also be subject to a number of management measures to that are aimed at improving the area's current EPBC Offset Policy assessed habitat score of 7/10 to 8/10 over a 20 year period.

In order to achieve the increase habitat score from 7 to 8 a number of specific goals have been set which are:

1. Permanent protection of the offset area from clearing and the impacts of livestock grazing through the use of conservation covenant registered on the title of the land.
2. Exclusion of livestock from the offset area by fencing.
3. Natural regeneration of native vegetation or successful infill planting to increase the number of trees that provide black cockatoo habitat.
4. The eradication (if needed) of noxious weeds and their ongoing exclusion from the offset area.
5. Prevention of the introduction of dieback (*Phytophthora cinnamoni*) into the offset area and containment of the pathogen should it be present or introduction occur.
6. Minimisation of the risk of wildfire and management of fuel loads to limit the impact should fire occur.
7. Increased utilisation of the area for foraging and breeding by black cockatoos.

A number of management measures will be implemented to achieve these goals, these are:

- The registration of a conservation covenant over the area with the Western Australian Commissioner of Soil and Land under the Soil and Land Conservation Act 1945.
- Fencing of the offset area and maintenance of this fence to exclude livestock,
- Monitoring of natural regeneration and infill planting as a contingency if natural regeneration rates fail to meet the plan targets,
- Mapping and control of noxious weeds and the implementation of weed hygiene procedures to minimise the risk of weed introduction,

- Implementation of *Phytophthora cinnamoni* (dieback) hygiene procedures to minimise the risk of dieback being introduced to the offset area and
- Installation of firebreaks and fuel reduction burns to control the risk of wildfire negatively impacting the offset areas value of black cockatoo habitat,

Monitoring of the effectiveness of the management measures will be undertaken.

The monitoring will measure:

- Black cockatoo habitat plant density and rates of natural regeneration,
- Success of infill planting (if needed),
- Fence integrity and effectiveness,
- Weed infestations and the effectiveness of control measures,
- Presence of dieback in the offset area,
- Fuel loads and the effectiveness of fuel reduction burns and
- Rates of utilisation of the area by black cockatoos for feeding, roosting and nesting.

Contingency plans have been put in place to deal with the impact of events such as failure of natural regeneration, noxious weed infestations, dieback infestation and wildfire.

This offset management plan will be reviewed initially 5 years after implementation and then every 2 years after that to ensure that the management measures being implemented will achieve the goals of the project, or to improve the measures in place as a result of improved scientific knowledge or the development of new techniques that may reduce the risk of plan failure.



## 2. Introduction and Purpose of Plan

### 2.1 Background

Talison Lithium Australia Pty Ltd (Talison) owns and operates a lithium mine near the town of Greenbushes in the south west of Western Australia. The Greenbushes mining operation represents the world's largest known lithium reserve and has been producing lithium for 25 years, thereby contributing to Australia's position as one of the two top global producers of lithium. The open cut lithium mine creates a large volume of waste rock on an ongoing basis. The waste rock is carted to the operation's waste rock dump (WRD), for above-ground disposal. The current WRD occupies a footprint of approximately 100 ha and has a height restriction of 330 mAHD in order to remain aesthetically consistent with the surrounding landscape after closure. At current mining rates, the WRD will have reached its maximum capacity by 2018, therefore development of the extension is required in 2017.

Talison has been granted approval by a delegate of the Federal Minister for the Environment and Energy for an expansion to the rock waste dump at its Greenbushes operation, which will result in the clearing of 75.7 ha of remnant and regrowth vegetation over a period of 11 years. The area contains habitat of various qualities for black cockatoos (*Calyptorhynchus banksii naso*, *Calyptorhynchus latirostris* and *Calyptorhynchus baudinii*), including 40.5 ha of suitable breeding, roosting and foraging habitat.

To offset the impacts to black cockatoo habitat as a result of the proposed development, Talison has entered into a twenty-year agreement with Tonebridge Grazing Pty Ltd (TBG) to protect and improve 121.7 hectares (ha) of eucalypt woodland located on private property on Lot 12421 on Deposited Plan 206992, Boyup Brook-Cranbrook Road, Tonebridge here after referred to as the offset site. This area will be protected and managed to enhance its value as black cockatoo habitat in order to offset the loss of habitat as a result of the clearing at the Greenbushes site.

### 2.2 Purpose and Scope

This Offset Management Plan (OMP) has been prepared to address the requirements of the for the Expansion of Mine Waste Rock Dump, Talison Lithium Greenbushes Operations, Greenbushes, Western Australia (EPBC 2013/6904), as issued on November 15<sup>th</sup> 2016.

The scope of the OMP is set by condition 4 of the DEE approval, which states that:

*4. The person taking the action must prepare and submit an Offset Management Plan (Plan), for approval of the Minister to compensate for the loss of approximately 75.7 hectares (ha) of black cockatoo habitat. The person taking the action must not commence the action unless the Minister has approved the Plan. The purpose of the Plan is to protect and improve the quality of black cockatoo habitat within the offset area identified in Attachment 1.*

*a. The Plan must include, but is not limited to:*

*i. management measures, including fencing and access controls, to prevent grazing, logging and other illegal land use practices within the offset area;*

- ii. objectives, targets and completion criteria for the infill planting, including site preparation works, seedling planting program, success rates, ongoing management post establishment and details of replanting requirements, if success rates are not achieved;
- iii. management measures including inspection and cleaning regimes to prevent the introduction and spread of *Phytophthora cinnamomi* (dieback) to the offset area;
- iv. rehabilitation measures such as site clean-up and weed management, including information on the mapping, monitoring and removal of noxious weeds;
- v. details on proposed fire management measures including firebreak creation and management;
- vi. timeframes and implementation for the above measures; and
- vii. descriptions of the roles and responsibilities of personnel associated with implementation of each of the above measures.

b. The Plan must provide clear objectives and performance indicators for all management actions, mitigation measures and practices prescribed by the plan including details of the monitoring to be undertaken to demonstrate the effectiveness of the measures and details of the parameters to be monitored, methods, timing, frequency and location of monitoring.

c. The Plan must demonstrate—for all actions, mitigation measures and practices prescribed by the plan—clear objectives and performance indicators as well as corrective actions for circumstances where an action, mitigation measure or practice fails to meet its prescribed objective or performance indicator and trigger action points at which these corrective actions should be implemented.

In addition, there are several commitments provided in the Referral Documentation, namely:

- A management agreement between Talison and BBG (Blackwood Basin Group), whereby the BBG manages the fencing and other works required in relation to the offset area and the payments to the landowner and/or contractors and Talison releases funds to the BBG on an annual basis. The agreement will require that the BBG reports to Talison on the condition of the fences and the offset blocks (based on its annual inspection), as well as works completed over the course of the year.
- A conservation agreement between Talison and the landholder, whereby the landholder will agree to have a conservation covenant registered in respect of the offset land and to fence and exclude livestock from the offset area, in exchange for which Talison will (through BBG) pay the costs of initial works (including fencing and firebreaks) and make periodic payments to the landowner in respect of ongoing fence maintenance and weed control, following inspections.
- A conservation covenant lodged with the Soil and Land Commissioner under the Soil and Land Conservation Act 1945 (WA) and registered on the title to the offset area land, that further binds the landholder and its successors in title to establish and maintain fences in order to prevent stock from accessing the offsets area and otherwise conserve the vegetation in the offsets area.

Table 1. Summary of approval conditions and other commitments and how this OMP addresses them.

Ref.	Cond.	Condition Requirement	Plan Reference	Demonstration of how the plan addresses condition requirements and commitments made in the plan to address condition requirements
1	4(c)	The person taking the action must prepare and submit an Offset Management Plan (Plan), for approval of the Minister to compensate for the loss of approximately 75.7 hectares (ha) of black cockatoo habitat	Entire document	
1	4(c)	The Plan must include, but is not limited to: i. management measures, including fencing and access controls, to prevent grazing, logging and other illegal land use practices within the offset area;	s5.3 (p.23), s11 (p.38), Table 3 (p.20)	- Offset area to be fenced and this fence maintained to a minimum standard for at least 20 years.
2		ii. objectives, targets and completion criteria for the infill planting, including site preparation works, seedling planting program, success rates, ongoing management post establishment and details of replanting requirements, if success rates are not achieved;	s5.4 (p.24), s8.3 (p.32), Table 3 (p.20)	- Infill planting if required will be done to achieve a minimum density of 1000 stems/ha of black cockatoo habitat plants. (note: this is the target for infill planting of tube stock only) - Target of 80% survival rate of planted seedlings after 1 year - Seedlings will be protected from grazing through the use of tree guards for 1 year after planting. - Weeds will be controlled to protect seedlings from competition using spot herbicide spraying and/or mulching.
3		iii. management measures including inspection and cleaning regimes to prevent the introduction and spread of <i>Phytophthora cinnamomi</i> (dieback) to the offset area;	s5.6 (p.24), s6.2 (p.29), Appendix 5	- All personnel and vehicles entering the site are required to adhere to dieback hygiene plan
4		iv. rehabilitation measures such as site clean-up and weed management, including information on the mapping, monitoring and removal of noxious weeds;	s5.5 (p.24), s8.6 (p.32), Table 3 (p.20),	- Weeds will be monitored annually and any infestations of noxious weeds to be mapped and removed as soon as possible. - All personnel are required to follow a weed

		Appendix 4.	hygiene plan.
<b>5</b>	v. details on proposed fire management measures including firebreak creation and management;	s5.7 (p.24), Table 3 (p.20)	- Firebreaks required along property boundary. - Annual monitoring of fuel loads. - Fuel reduction burns if fuel loads exceed 8 t/ha.
<b>6</b>	vi. timeframes and implementation for the above measures;	s11 (p.38), Table 5 (p.25), Table 9 (p.38).	- Timeframes are outlined in Table 5 and Table 9.
<b>7</b>	vii. descriptions of the roles and responsibilities of personnel associated with implementation of each of the above measures.	s5.1 (p.23), s11 (p.38)	- TBG and the BBG are responsible for implementation of the management strategies outlined in the OMP. - The BBG is responsible for the monitoring and reporting outlined in the OMP.
<b>8</b>	4(b) The Plan must provide clear objectives and performance indicators for all management actions, mitigation measures and practices prescribed by the plan including details of the monitoring to be undertaken to demonstrate the effectiveness of the measures and details of the parameters to be monitored, methods, timing, frequency and location of monitoring.	s8 (p.31), Table 3 (p.20)	- The OMP sets out objectives, performance and management actions for fencing, natural regeneration, infill planting, weeds, dieback and fire risk management - Monitoring plans are clearly described for all management objectives.
<b>9</b>	4(c) The Plan must demonstrate—for all actions, mitigation measures and practices prescribed by the plan—clear objectives and performance indicators as well as corrective actions for circumstances where an action, mitigation measure or practice fails to meet its prescribed objective or performance indicator and trigger action points at which these corrective actions should be implemented.	s5 (p.23), s6 (p.26), Table 3 (p.20)	- Need for infill planting to be assessed after 3 years with levels of regeneration compared against nearby natural vegetation. - Dieback control measures will be undertaken if the pathogen is found in the offset area - Noxious weeds will be mapped and controlled to eliminate them from the offset area.
<b>10</b>	4(c) The person taking the action must not commence	n/a	- Clearing is yet to commence

<p>the action unless the Minister has approved the Plan</p>	
<p><b>Other commitments</b></p>	
<p><b>11</b></p>	<p>A management agreement between Talison and BBG, whereby the BBG manages the fencing and other works required in relation to the offset area and the payments to the landowner and/or contractors and Talison releases funds to the BBG on an annual basis. The agreement will require that the BBG reports to Talison on the condition of the fences and the offset blocks (based on its annual inspection), as well as works completed over the course of the year.</p>
<p><b>12</b></p>	<p>A conservation agreement between Talison and the landholder, whereby the landholder will agree to have a conservation covenant registered in respect of the offset land and to fence and exclude livestock from the offset area, in exchange for which Talison will (through BBG) pay the costs of initial works (including fencing and firebreaks) and make periodic payments to the landowner in respect of ongoing fence maintenance and weed control, following inspections.</p>
<p><b>13</b></p>	<p>A conservation covenant lodged with the Soil and Land Commissioner under the Soil and Land Conservation Act 1945 (WA) and registered on the title to the offset area land, that further binds the landholder and its successors in title to establish and maintain fences in order to prevent stock from accessing the offsets area and otherwise conserve the vegetation in the offsets area.</p>
<p>S5.1 (p.23), Appendix 2</p>	<p>-Talison and the BBG have entered into a legally binding agreement which sets out the requirements on both parties</p>
<p>S5.1 (p.23), Appendix 1</p>	<p>Talison and TBG have entered into a legally binding agreement where TBG has agreed to take out a conservation covenant over the offset area and to manage the area in conjunction with the BBG following this OMP.</p>
<p>s5.2 (p.23), Appendix 3</p>	<p>An application for a conservation covenant over the offset area was submitted to the Soil and Land Commissioner on September 7<sup>th</sup> 2016.</p>

## 3. Nature and Context of the Project

### 3.1 Impact area

The area to be cleared for the expansion of the WRD at the Greenbushes sites consists of a total of 75.7 ha of black cockatoo habitat of variable quality, with 30.6 ha was assessed as poor (habitat score 3) and 44.6 ha as good quality (habitat score 6). The impact area consists of some habitat that has previously been cleared and revegetated as well as areas of uncleared mixed jarrah/marri forest. Previous surveys have identified the area as black cockatoo foraging habitat. The area is planned to be cleared in stages over a 14 year period.

In order to offset the loss of black cockatoo habitat from the clearing of the impact area Talison has partnered with Tonebridge Grazing and the Blackwood Basin Group to protect and enhance an area of black cockatoo habitat at the offset site that is at risk of continued degradation due to uncontrolled livestock grazing.

### 3.2 Offset area

#### 3.2.1 Site description

The offset area is located 75km to the south east of the impact site in the locality of Tonebridge and consists of 121.74 ha of remnant native jarrah/marri forest vegetation in three sections (Figure 1). The largest most southerly section is 85.6 ha and the two northerly sections are 26.7 and 9.4 ha (Figure 1). Vegetation within the areas consists of jarrah/marri forest of mixed age classes, and although there has been historical logging in some parts, many large, old, senescent trees remain. The presence and condition of vegetation other than jarrah and marri, such as mid-storey *Banksia spp.*, shrubs and groundcover, varies significantly. Vegetation other than jarrah/marri canopy trees is largely absent in areas closer to the edges of the remnants (Figure 2). There has been very little recruitment of younger jarrah/marri seedlings of the age class <20 years, particularly in open areas where such recruitment should normally be expected, most likely as a result of grazing by cattle. An assessment of the offset area by Tony Kirkby confirmed the presence of forest red-tailed black cockatoos and Baudin's cockatoos in the offset area (Kirkby, 2016).

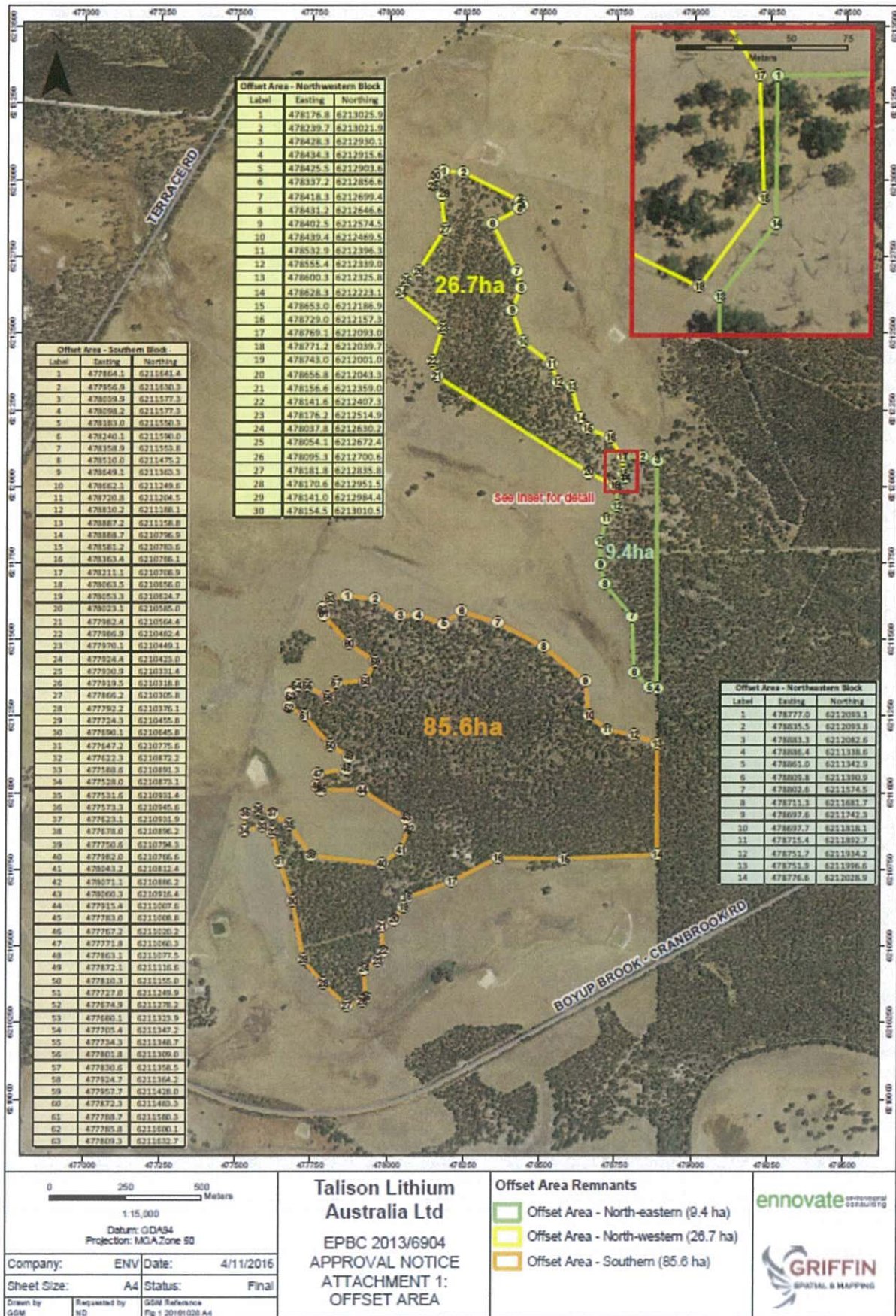


Figure 1. Map of offset area



*Figure 2. Images showing variation in understorey in different parts of the offset area.*

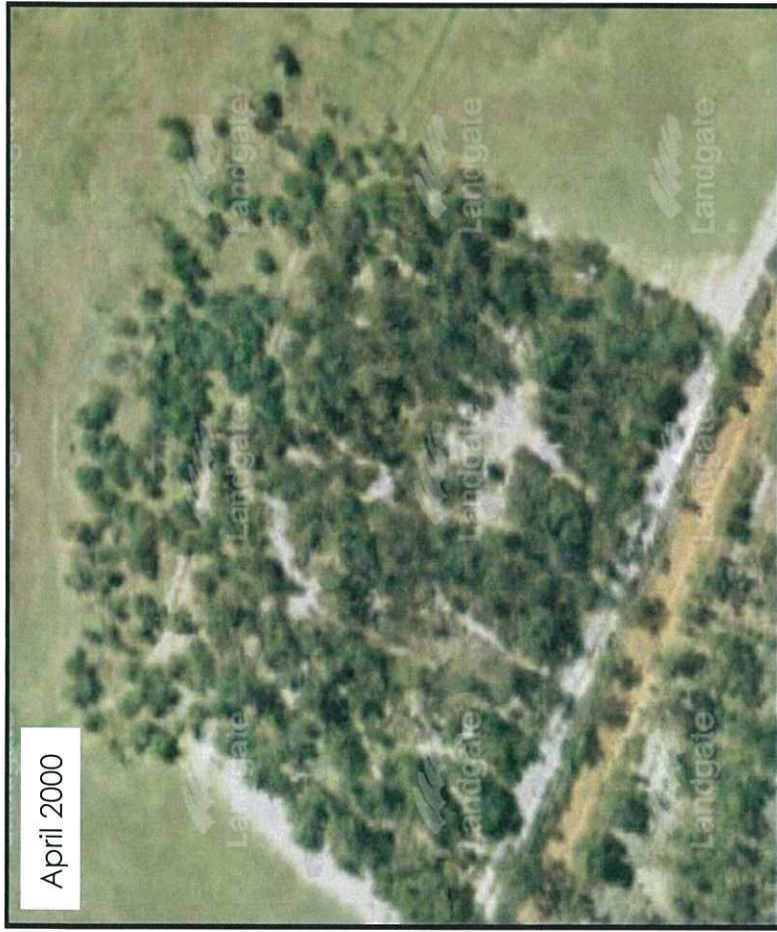


### 3.2.2 Threats prior to plan implementation

Prior to the implementation of the conservation covenant over the offset area and the implementation of this OMP, the offset area was accessible to livestock, historically cattle and sheep, which has resulted in some degradation of the area, particularly near the edges of the offset area. Without protection, it is expected that in twenty years' time at least 80% of the offset area would be largely devoid of living jarrah/marri trees and underlying vegetation. This would see the northern of the two remnants disappear as black cockatoo habitat, with the exception of nesting hollows in dead trees (if the timber is allowed to remain upright – there is little protection for dead vegetation under WA land clearing legislation). With such a significant reduction in canopy cover and forage resources, utilisation of the remnants by black cockatoos would be expected to diminish to nothing – or close to it. This expectation is verifiable both in literature (Pettit, et al., 1998) and in the local area where there are multiple examples of the effects of cattle on vegetation, such as along the edges of the proposed offset remnants (Figure 3) and of other isolated remnants where the grazing and condition history can be ascertained (Figure 4).



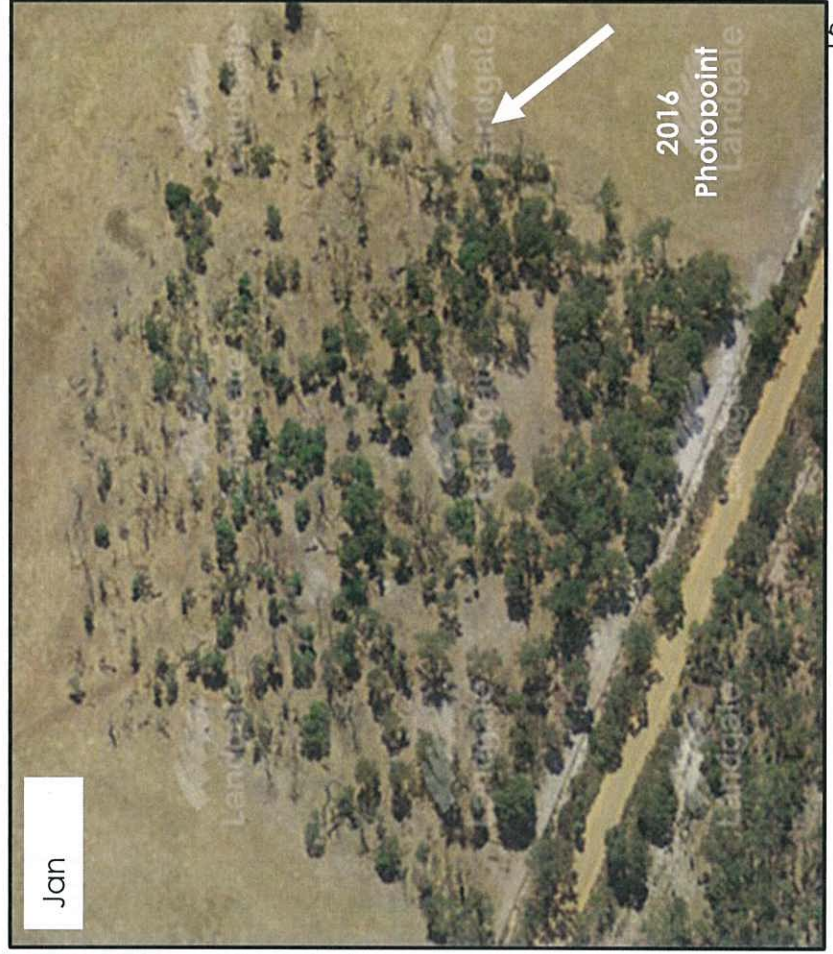
Figure 3: The terminal and near-terminal effects of cattle along an edge of Marri - Jarrah woodland (offset site).



April 2000



April 2016



Jan

2016

Photopoint

Figure 4: Degrading effects of uncontrolled cattle access.

The two aerial snapshots show the general reduction in vegetation cover over a 14-year period, both at the canopy and ground levels, solely as a result of cattle or sheep. The photograph in the top right of the page shows the current condition of the northwest corner of the remnant.

The remnant is on same title as the offset proposal (cnr of Terrace Rd and Boyup Brook – Cranbrook Road,

Most of the damage caused by cattle, according to (Pettit, et al., 1998) arises from:

- grazing of native species, including recruitment plants;
- surface soil compaction and water repellency;
- soil enrichment in nutrients (N and P) to the detriment of native plants;
- physical damage to trees and plants; and
- corresponding increases in exotic plant species.

These effects can seriously threaten the viability of the vegetation of an area, particularly where there are no new (overstorey) trees to replace those that die.

### **3.2 Black Cockatoo Habitat Requirements**

All three black cockatoo species are endemic to the southwest of Western Australia within an area south of the line between the Murchison River and Esperance.

#### **3.2.1 Forest red-tail black cockatoo, *Calyptorhynchus banksii naso*.**

The forest red-tailed black cockatoo roosts in mature jarrah, marri and blackbutt trees and feed within approximately 4km of the roost. They predominantly feed on the seeds of marri and jarrah trees and have been shown to select particular trees for foraging based on the number and weight of seed that the trees produce (Cooper, et al., 2003). They also remember suitable foraging trees and return to the same trees over multiple years. They have also been observed to strip bark from trees in search of invertebrate larvae (Johnstone & Kirkby, 1999). This species nests in large hollows primarily in marri, with trees needing to be in excess of 200 years old to provide suitable hollows (Garnett & Crowley, 2000; Chapman, 2008).

#### **3.2.2 Carnaby's black cockatoo, *Calyptorhynchus latirostris***

Carnaby's black cockatoos breed in the northern wheatbelt of Western Australia moving to the higher rainfall areas during the non-breeding season (October to early July). When in these areas they feed on various species of Banksia, Grevillea, Hakea, Dryandra and seeds of Eucalyptus, including jarrah and marri. They will also feed on the cones of introduced *Pinus spp.* and in some areas have come to rely on this food source as native habitat has been lost (Shah, 2006).

#### **3.2.3 Baudin's black cockatoo, *Calyptorhynchus baudinii***

Baudin's black cockatoo nests in large hollows of marri, jarrah, wandoo and karri trees in the lower southwest of WA (Johnstone & Storr, 1998). They feed primarily on the seeds of marri in the forested regions of southwest Western Australia (Sanders 1974). They also feed on seeds of various *Banksia spp.* and jarrah. Their diet also includes invertebrate larvae, which they obtain by stripping bark from trees (Johnstone & Storr, 1998). Unlike the Carnaby's, Baudin's black cockatoo is not known to feed on pine plantations that are present in its range (Saunders, 1974).

## **4. Environmental outcomes and criteria**

The overarching goal of this management plan is to protect and improve the quality of the black cockatoo habitat within the offset area from a currently assessed score of 7/10 to 8/10 within 20 years. For the currently assessed habitat score of 7 to increase to 8 over the 20 year period there is a requirement that livestock are excluded from the area and numbers of black cockatoo foraging habitat plants increase over time across the area, which is expected to result in increased utilisation of the area by black cockatoos. Additionally there is the requirement for the availability of nesting hollows to be maintained and preferably increased over

Expansion of mine waste rock dump, Talison Lithium Greenbushes Operations, Greenbushes, Western Australia:20/11/2017

the 20 year period. Table 2 describes the current status of the offset area in relation to the habitat assessment framework and how these values are aimed to improve over the 20 year period.

Table 2. Current status of habitat in the offset area and the improvements required to achieve the goal of this plan.

	Current Condition	20 Years – With Offset
<b>Forage resources</b>	High value forage resources: Plentiful Marri and Jarrah, with sparse <i>Banksia sessilis</i> , <i>B. grandis</i> .	High value forage resources: Plentiful Marri and Jarrah, with increasing numbers of <i>Banksia sessilis</i> , <i>B. grandis</i> , <i>Persoonia</i> spp. and <i>Allocasuarina</i> spp. Total density of black cockatoo habitat plants is equal to or greater than that in nearby natural vegetation.
<b>Forage activity</b>	FRBC and BBC noted using area. Multiple signs of heavy use (feeding).	Increased utilisation as a result of increased resources.
<b>Roosting sites/activity</b>	None observed, but suitable trees present.	<i>Difficult to predict.</i>
<b>Nesting hollows</b>	Suitable and seemingly utilised nesting hollows present, as well as >100 large marri, with good numbers of smaller trees.	Number of hollows to increase as large trees senesce, although not significantly.
<b>Nesting activity</b>	None observed, but probably present. 2 trees noted by Kirkby (2016) as showing signs of nesting use.	Increased use of hollows and food resources. Confirmed breeding by black cockatoos in offset area.
<b>Threatening processes</b>	Cattle grazing/sheltering in vegetation. Competition for hollows (no feral honeybees observed by surveyor or landowner).	Exclusion from livestock grazing (fencing, with maintenance plan); with area under restrictive, perpetual covenant to exclude livestock.
<b>Availability of other areas</b>	Part of 500 ha native remnant. Less than 10km to Unicup Nature Reserve and Palgarup State Forest. Not a considered variable.	
<b>Overall Habitat Quality</b>	7/10	8/10

In order to achieve this overall improvement in habitat quality and utilisation a number of management objectives have been defined. These are:

1. Permanent protection of the offset area from clearing and the impacts of grazing by livestock through the use of conservation covenant registered on the title of the land.
2. Permanent exclusion of livestock from the offset area by fencing.
3. Natural regeneration of native vegetation or successful infill planting to increase the number of trees that provide black cockatoo habitat.
4. The removal (if needed) of noxious weeds and their ongoing exclusion from the offset area.
5. Prevention of the introduction of dieback (*Phytophthora cinnamoni*) into the offset area and containment of the pathogen should introduction occur.

6. Minimisation of the risk of wildfire and management of fuel loads to limit the impact should fire occur.
7. Increased utilisation of the area for foraging and breeding by black cockatoos.

Table 3. Management aspects and objectives and their associated performance criteria, monitoring requirements, targets and contingencies.

Aspect	Objectives	Ongoing management	KPIs	Monitoring	Targets	Completion Criteria	Contingency
<b>Legal protection of offset area</b>	Area is under restrictive, perpetual covenant	Not required	Registration of covenant	Not required	Covenant registered by June 30 <sup>th</sup> 2017	Registration of covenant.	Not applicable
<b>Livestock Exclusion</b>	Fence excludes livestock from offset area.	Maintenance of fence to minimum standard (Table 4. Minimum standard for the boundary fencing for the offset area. Table 4).	Number of breaches in fence. Evidence of livestock incursion into offset area	Fence monitoring	Fence constructed by June 30 <sup>th</sup> 2017. Entire fence meets minimum standard. No evidence of livestock incursion.		Fence will be repaired to meet minimum standard.
<b>Black cockatoo habitat plant density</b>	Black cockatoo habitat plant density is equal to or greater than nearby natural vegetation.	Continued exclusion of livestock allowing restoration of natural plant and soil functions. Weed control (if needed).	Mean density of black cockatoo habitat plants.	Black cockatoo habitat plant monitoring.  Seedling survival 1 year post planting for infill planting (contingency).	Density of black cockatoo habitat plant is equal to or greater than that in nearby natural areas.  80% survival of planted seedlings after 1 year.	Density of black cockatoo habitat trees is equal to or greater than in surrounding natural areas and is maintained for a minimum of 5 years with ongoing germination of new native seedlings.	Infill planting to achieve minimum density target.
<b>Weeds (except noxious weeds)</b>	Weeds do not inhibit the natural regeneration of vegetation of the success of infill planting.	Weed hygiene procedures for equipment and personnel. Continued exclusion of livestock, allowing restoration of natural plant and soil functions.	Fuel loads. Area treated for weeds each year.	Black cockatoo habitat plant monitoring	Measurable decline over time in the area treated for weeds and the time required for weed treatment.	Weed treatment is not needed for 3 consecutive years.	Application of selective herbicide or hand-control.
<b>Noxious weeds</b>	Noxious weeds do not reduce the habitat	Weed hygiene procedures for equipment and	Number of noxious weeds found by	Weed monitoring. Weed mapping of	Noxious weeds do not establish populations in the		Application of selective herbicide or

value of the offset area.	personnel. Mapping of infestations (contingency) Manual removal or spot herbicide spraying to remove weeds (contingency)	surveys. Cost of supplementary (contingency) weed control each year	infestations (contingency)	offset area. Any noxious weeds infestations are prevented from spreading and are eliminated within 5 years.	hand-control.
<b>Dieback</b> Dieback does not enter and degrade the habitat in the offset area. Dieback does not spread in the offset area (contingency).	Dieback hygiene procedures for equipment and personnel.	Evidence of dieback infestation/confirmation of infestation. Number of incidents of non-compliance with dieback hygiene procedures.	Dieback monitoring. Ongoing observation by landholder.	Dieback does not enter the offset area. Dieback does not spread outside of the affected area (contingency).	Exclusion of all vehicles and personnel from affected areas.
<b>Fire</b> Avoid wildfire in the offset area that negatively impacts on black cockatoo habitat. No nett less of nesting hollows for black cockatoos should unplanned fire occur.	Firebreaks Mapping of area affected by fire and any fallen trees (contingency) Installation of cockatoo nesting tubes (contingency).	Annual maintenance of firebreaks. Fuel loads (t/ha) Area burnt in fuel reduction burns. Number of trees with potential nesting hollows felled as a result of fire. Number of cockatoo nesting tubes installed. Recorded use of nesting tubes.	Monitoring of firebreaks. Annual monitoring of fuel loads. Post fire habitat monitoring.	No unplanned fires in offset area. No nett loss of nesting or potential nesting hollows should unplanned fire occur.	Weed control post fire and infill planting if natural regeneration is not sufficient to achieve habitat density targets within 3 years of fire.

## 5. Management Measures

In order to achieve the management objectives outlined previously and the overarching aim of this plan, which is to achieve an increase in habitat quality, as described in the EPBC Offset Guidelines, from an initial score of 7/10 to a final score of 8/10 after 20 years, a number of management measures have been identified. These measures relate to fencing and access control, revegetation, weed management, fire risk management and dieback risk management.

### 5.1 Roles and responsibilities

Talison has entered into a legally binding agreement with TBG where TBG has committed to taking out a conservation covenant over the offset area and has agreed to manage the area in conjunction with the BBG following this Site Rehabilitation and Environmental Monitoring Plan (SREMP). In exchange Talison has agreed to pay all costs of major works such as fencing and infill planting and has agreed to pay an annual maintenance fee to TBG for 20 years. The agreement is attached in Appendix 1.

Talison has also entered into a legally binding agreement with the Blackwood Basin Group (BBG), where the BBG will be paid to coordinate the works required to fence the offset area and any future works such as infill planting and weed control if required. The BBG will also conduct the monitoring described in this plan and will report annually to Talison on compliance with the plan as well as the results of the monitoring. The agreement is attached in Appendix 2.

### 5.2 Conservation Covenant

Tonebridge Grazing will have a perpetual conservation covenant registered on the Certificate of Title for the parcel of land containing the offset area (Lot 12421 on Deposited Plan 206992, Boyup Brook-Cranbrook Road, Tonebridge). The covenant will be registered with the Western Australian Commissioner of Soil and Land under the Soil and Land Conservation Act 1945. The conversation covenant requires the current and future owners of the land to manage the offset area to protect its value as native vegetation. The draft conservation covenant is attached in Appendix 3.

### 5.3 Fencing and access control

The entirety of the offset area is within private property and is not accessible to the public. However the area still needs to be fenced to define the area, exclude livestock and manage unauthorised access. The fencing will be constructed to at least the minimum standard shown in Table 4 and will be maintained to at least the same standard for 20 years. The fencing will continue to be maintained to exclude livestock in perpetuity as per the conditions of the conservation covenant.

Table 4. Minimum standard for the boundary fencing for the offset area.

Fencing Component	Minimum standard
Strainers and Posts	High quality steel, hardwood or treated pine
Netting	7 strand ringlock
Barbed Wire	Single line above ringlock
Gates	Lockable steel mesh gates



## 5.4 Revegetation

Natural regeneration is the most effective means of restoring ecological values to degraded areas as it results in the regeneration of locally adapted and diverse vegetation communities (South East Queensland Catchments, Undated). For this reason no direct revegetation activities will be undertaken initially, and the ability of the area to naturally revegetate will be assessed for 3 years. After this time the density of black cockatoo habitat trees in the degraded areas of the remnant will be compared to those in surrounding natural vegetation at Tone-Perup Nature Reserve to determine if infill planting is required. Tone-Perup Nature Reserve has been chosen as a reference site due to its close proximity (~2.5km away) and the fact that the area contains old-growth mixed jarrah and marri forest that represents high value habitat for black cockatoos. If the density of black cockatoo habitat plants in the offset area is significantly lower than those in nearby natural vegetation in 2020 then infill planting will be undertaken.

To encourage the germination of the soil seed bank and to reduce competition and fire risk from introduced grasses a combination of crash grazing and a fuel reduction burn will be used in the first year in the two northern blocks of the offset area. These two blocks have very little native understorey plants as a result of livestock grazing and a dense cover of pasture grasses. The use of crash grazing (maximum 3 weeks, using sheep) and prescribed fire will achieve a reduction in cover from introduced pasture grasses, reduction in fuel loads and will stimulate the seedbank to germinate.

## 5.5 Weed management

Weeds (except noxious weeds) are only considered a threat to the values of the offset area as black cockatoo habitat if they limit the regeneration of native vegetation or the success of infill planting, as black cockatoos have been observed to use many paddock grasses as food (Johnstone & Kirkby, 1999). As such the primary focus of weed management within the offset area is through the assessment of the impact of weeds on revegetation success.

Noxious weeds will be managed through the initial mapping of the area to determine the presence/ extent of infestation by noxious weeds. Noxious weeds will be controlled through the use of spot herbicide spraying or physical removal with the control effort maintained over at least 5 years to ensure that viable soil seed banks are exhausted. The risk of noxious weeds being introduced to the offset area will be minimised by implementing industry-standard weed hygiene measures (see Appendix 4).

If the monitoring of the offset area or observations by the landholder find the presence of noxious weeds at any time the extent of weed infestation will be mapped and the control measures will be implemented. Control of weed infestations will be undertaken by the landholder or an appropriately certified contractor.

## 5.6 Dieback (*Phytophthora cinnamoni*) risk management

There is currently no evidence of dieback affecting the vegetation in the offset area. To limit the possibility of dieback entering the area all vehicles will be washed down

to remove loose soil prior to entering the offset area and all personnel entering the area will wash down their shoes to also ensure no foreign soil is brought into the area that may contain the pathogen. Procedures attached in Appendix 5.

## 5.7 Fire risk management

The ecosystems of the south-west of Western Australia are well adapted to fire with fire intervals of 3 to 30 years having no significant impact of the composition of biota within the jarrah forest of the Warren Region (Wittkuhn, et al., 2011). The primary impact of fire on black cockatoo habitat is through the loss of nesting hollows as a result of the burning of large senescent trees. The focus of fire management for the offset area is therefore the exclusion of wildfire and the limitation of its intensity should it occur to reduce the loss of black cockatoo nesting sites.

Fire risk will be managed through the establishment of a mineral earth firebreak with a minimum width of 3m on the eastern boundary of the offset area where the area backs onto an adjoining property. All other boundaries of the offset area are surrounded by cleared farmland, used for pasture, which presents a minimal risk of fire to the offset area.

Prescribed fire will be used to minimise the intensity of wildfire should the offset area be affected. Fuel reduction burns will be undertaken in autumn so as not to affect breeding cockatoos and also to limit the impact on seedling survival. Prior to a fuel reduction burn being undertaken leaf litter will be cleared from around large trees that are likely to contain hollows suitable for nesting to ensure that these trees are not felled as a result of the burn. Fuel loads will be monitored annually in December when firebreaks are also monitored and when fuel loads in an offset block exceed an average of 8 t/ha the area will be subject to a controlled burn in the following autumn. Fuel in mixed jarrah and marri forest accumulates at a rate of ~1-2 t/ha/year, therefore fuel reduction burns are expected to be required every 4-8 years.

In the first year when crash grazing is used to reduce fuel loads in the two northern blocks of the offset area fuel load monitoring will be done after the period of grazing to quantify the reduction in fuel load achieved.

## 5.8 Implementation schedule

Table 5. Implementation schedule for management measures.

Objective	Management measures	Where	When	Performance criteria	Related monitoring activity
<b>Perpetual legal protection</b>	Conservation covenant	Entire offset area	30 <sup>th</sup> June 2017		Not applicable
<b>Access control</b>	Fencing and access control	Boundary of offset area	30 <sup>th</sup> June 2017		Fencing
<b>Revegetation</b>	Natural regeneration or infill planting (if needed)	Entire offset area	Ongoing, need for infill assessed in 2020		Natural regeneration Infill planting

	Prescribed fire to stimulate seedbank germination	Two northern blocks	Autumn of 2018	Fuel loads
<b>Weed Management</b>	Weed monitoring, weed mapping, weed control (if needed). Weed hygiene procedures	Entire offset area	Monitoring annually in spring. Ongoing use of weed hygiene procedures.	Weed monitoring
<b>Fire risk management</b>	Firebreaks  Fuel reduction burns  Crash grazing (first year only)	Eastern boundary of offset area (firebreaks) Entire offset area  Two northern blocks	Firebreaks: annually, before November 30 Fuel reduction burns as required according to fuel load assessment. Nov/Dec 2017	Firebreaks   Fuel loads
<b>Dieback risk management</b>	Dieback hygiene procedures	Entry points to offset area	Ongoing	Dieback

## 6. Risk Assessment and Contingency Response

The summary of the risks associated with the specific management objectives in this plan and the contingencies in place are given in Table 6.

Table 6. Risk assessment summary including contingencies and related monitoring activities.

Objective	Event or circumstance	Likelihood	Consequence	Risk level	Trigger	Contingency/s	Related monitoring activity
<b>Revegetation</b>	Rates of natural revegetation fail to achieve densities of black cockatoo habitat plants equal to or greater than nearby natural vegetation.	Possible (rates of natural regeneration on are difficult to predict due to factors such a soil compaction, seed banks present etc.)	Minor (lack of natural regeneration can easily be addressed through infill planting)	Low	Monitored density of black cockatoo habitat plants is not equal to or greater than nearby natural vegetation by 2020.	Infill planting	Black cockatoo habitat monitoring
<b>Dieback</b>	Dieback ( <i>Phytophthora cinnamomi</i> ) enters the offset area	Unlikely (Dieback hygiene procedure will be in place to minimise risk)	Major (there is no reliable way to remove <i>P. cinnamomi</i> from an area once infested and many black cockatoo habitat plants are susceptible to the pathogen.)	High	Monitoring of area by landholder or BGC suggests the presence of dieback.	-Testing to confirm pathogen presence. -Fencing of affected area to exclude machinery, personnel and fauna. -Ongoing monitoring of infestation.	Dieback monitoring
<b>Weeds</b>	Weeds (except noxious weeds) are found to be inhibiting	Possible (weed species)	Minor (effects of weeds on regeneration or regeneration or pathogen.)	Low	Natural regeneration fails to achieve density goals. Infill planting fails	-Weed control through spot or broad-scale herbicide application	Weed monitoring

<p>the success of natural regeneration or infill planting</p>	<p>are likely to increase growth initially following removal of (livestock)</p>	<p>infill plants can be addressed through a weed control program)</p>	<p>to achieve 80% survival rate.</p>	<p>where appropriate. -Mulching around infill planting.</p>
<p><b>Wildfire</b></p>	<p>Uncontrolled wildfire affects the offset area</p>	<p>Possible (adjoining property has native forest and bluegum plantations which will carry wildfire easily)</p>	<p>Medium</p>	<p>Part or all of offset area is burnt by wildfire.</p>
		<p>Moderate (Loss of roosting sites if old senescent trees are lost can be addressed through nesting tube installation. Weed invasion post fire can be addressed through a weed control program.)</p>		<p>-Installation of cockatoo nesting tubes if known or potential breeding sites are lost. -Weed mapping in spring following fire.</p>
				<p>Weed monitoring. Black cockatoo habitat utilisation.</p>

## 6.1 Revegetation

If by 2020 the amount of natural regeneration occurring within the offset area is not sufficient to meet the minimum target of the density of black cockatoo habitat plants within the offset area being equal to or greater than that in surrounding natural vegetation at the nearby Tone-Perup Nature Reserve, infill planting will be undertaken. Infill planting will be done to achieve a density of 1000 stems/ha of black cockatoo habitat plants. This density has been chosen to achieve a final density of mature black cockatoo habitat plants that is expected to be equal to or greater than that in surrounding natural vegetation.

All revegetation stock will be sourced from nurseries with NIASA accreditation to ensure that tubestock soil is disease free. Local provenance stock will be used where available. The indicative species list (based on availability) is provided below:

- *Eucalyptus marginata* (Jarrah)
- *Corymbia calophylla* (Marri)
- *Allocasuarina fraseriana* (Sheoak)
- *Banksia attenuata* (Candlestick Banksia)
- *Banksia sessilis* (Parrot bush)
- *Banksia menziesii* (Firewood Banksia)
- *Hakea amplexicaulis* (Prickly hakea)
- *Hakea lissocarpa* (Honey bush)

Given that the offset area is vegetated, scarification and/or ripping will only be undertaken prior to planting if it is possible for machinery to gain access to the areas to be planted.

Seedlings will be protected from grazing by native and feral animals through the use of tree guards for 1 year after planting. Weed control will also be undertaken when necessary to avoid weeds smothering young seedlings. This control will be through a combination of spot herbicide spraying and mulching where appropriate.

## 6.2 Dieback

Dieback hygiene procedures will be implemented for all personnel working at the site. The details of the procedures are given in Appendix 5. If *Phytophthora cinnamoni* (dieback) is found in the offset area the affected area will be mapped and fenced to exclude personnel and native wildlife to limit the risk of the pathogen spreading to surrounding areas.

## 6.3 Weeds

If monitoring identifies the presence of noxious weeds in the offset area the extent of the presence of those weeds will be mapped and they will then be removed, either through manual removal or by spot herbicide spraying by TBG or an appropriately certified contractor.

## 6.4 Wildfire

If a wildfire affects all or part of the offset area the impact of the fire will be assessed through mapping of the burnt area to determine what loss of actual or potential roost/nesting sites (large hollow bearing marri trees) has occurred. If trees containing nesting sites are felled by fire this primarily occurs as a result of burning at the base of

the tree which leave the occur parts intact where hollows occur. If nesting sites have been lost as a result of fire artificial hollows will be constructed and erected in the area to replace the hollows lost. Weed invasion after wildfire is also a considerable risk which will be monitored through weed mapping of the burnt area in the spring following a fire. Control of noxious weeds will then be implemented (if needed) as previously described.

## **7. Managing uncertainty and adaptive implementation**

### **7.1 Assessment of uncertainty**

The management measures implemented as part of this plan all have high degrees of certainty associated with them. The monitoring of the rates of natural regeneration and infill planting as a contingency to deal with failure of natural regeneration are based on long standing revegetation techniques that will give a very high chance of success. The diet of black cockatoos is well studied and therefore we are certain that the plant species chosen for infill planting, should it be required, will add to the value of the area as black cockatoo habitat. Fencing to exclude livestock is a standard practise in farming operations and we therefore do not foresee any possibility of the fence failing to achieve its stated aim of livestock exclusion. Similarly the weed and dieback hygiene procedures to be implemented are based on techniques that have been shown to have a very high success rate in avoiding the introduction of weeds and dieback to areas, where they are followed rigorously.

The primary uncertainty that comes into the plan is how the climate of the offset area may change over the 20 year project period and how this may affect the vegetation present and its value as habitat for black cockatoos. This uncertainty will be managed through the ongoing process of plan review, which will update the plan and its included management measures should this be required as a result of climate change.

### **7.2 Adaptive implementation**

The plan includes a level of adaptive implementation through the allowance of natural regeneration processes with contingencies for infill planting if required. The process of ongoing review of the plan in relation to the monitoring data and the likelihood of the plan being successful will ensure that the plan is constantly improved over the 20 time-span of the project which will ensure the highest possible likelihood of success. The process of reviewing the management plan (described in 10. Review and Audit) will involve the reassessment of project risks as well as an analysis of whether the changes observed are likely to achieve the goals of the project.

Details of the implementation of the plan including monitoring dates and any works undertaken will be included in the annual report prepared by the BBG for Talison. Talison also has the right under the contract between the two parties to audit the BBG's records of project management to ensure the plan is being implemented as written.

## **8. Monitoring**

A number of different monitoring strategies will be implemented to track progress of the management measures in order to ensure they will achieve the objectives of the project. The monitoring will be undertaken by suitably qualified and experienced ecologists/appropriate experts to ensure the data collected are robust and reliable. All monitoring data will be maintained by the BBG and shared with Talison and TBG.

### **8.1 Black cockatoo habitat**

#### **8.1.1 Data collection**

The density of black cockatoo habitat plants will be assessed in four 20x20 m (400 m<sup>2</sup>) quadrats in each of the three remnant blocks (12 quadrats in total), with 2 quadrats in each block near the edges the remnant and 2 in the interior, where less degradation has occurred. The area will first be surveyed to define the degraded areas around the edges of the remnants and the interior sections and the quadrats will then be randomly placed within the two areas in each remnant.

Each of the plants will be identified to species level to assess the changes occurring in different species numbers over time. Within these areas the location of the quadrats will be selected randomly. A further 4 quadrats of equal size will be surveyed in an area of nearby natural vegetation in the Tone-Perup Nature Reserve with which to compare the vegetation within the offset area (Figure 5). These quadrats will be surveyed bi-annually for comparison with the offset area to account for changes that may occur over time as a result of seasonal conditions and/or climate change.

Within these quadrats the number and size (diameter at breast height) of all black cockatoo habitat plants will be recorded and the number of new germinating seedlings will also be recorded. The results of this monitoring will be used to assess the success of natural regeneration and the need for infill planting. One photo-monitoring point will also be set up at each of the quadrats to provide a qualitative assessment of the condition of the habitat over time. These photo-points will be repeated annually.

#### **8.1.2 Data Analyses**

The black cockatoo habitat data collected from the offset site will be compared to the same data collected from the nearby Tone-Perup Nature Reserve by using analysis of variance (ANOVA), or a non-parametric statistical test should the data not be normally distributed, to determine if there is a significant difference between the plant densities at the two sites. Linear regression of the mean black cockatoo habitat plan density against the time since implementation of the plan will be used to assess the overall progress being made towards the aim of achieving similar densities between the two areas within the 20 year timespan of the plan.

### **8.2 Fencing**

The state of the fencing will be monitored annually to ensure that livestock remain excluded from the offset area. The entire length of the fence will be inspected and signs of incursions by livestock will be recorded. TBG will maintain a record of any breaches to the fence and the actions taken to fix them. Photopoints will also be



implemented with 1 photo-point taken for every kilometre of fence (10 points total). These photo-points will be taken annually to provide a qualitative record of the condition of the fence over time. No analysis of these data are required.

### **8.3 Infill planting (if needed)**

The initial success of infill planting will be assessed through seedling survival monitoring undertaken 1 year after planting with the aim of achieving 80% survival of planted seedlings. The quadrats used for this assessment will be the same as those used for the previously described black cockatoo habitat plant density monitoring.

### **8.6 Weeds**

Weeds (except noxious weeds) are only considered a threat to the offset area's value as black cockatoo habitat if they limit the success of natural regeneration or infill planting. For this reason the impact of weeds will be monitored in conjunction with the monitoring of regeneration of infill planting success to assess the need to instigate weed control.

The entire offset area will be mapped for the presence and distribution of noxious weeds in spring of 2017. The results of this mapping will be used to guide weed control plans and to inform the future monitoring of the area.

Noxious weeds will be monitored annually using a series of line transects running east-west across the three remnants at 300m intervals (see Figure 5). These transects will be surveyed annually between August and October. The presence of any noxious weeds will also be recorded in the quadrats surveyed for the density of black cockatoo habitat plants. Additionally TBG will keep a record of any noxious weeds seen in the area and will inform the BBG so that actions can be taken to control them.

### **8.5 Dieback (*Phytophthora cinnamoni*)**

The presence of *Phytophthora cinnamoni* (dieback) in the offset area will be monitored through the annual black cockatoo habitat plant density surveys, weed survey transects and through ongoing observation of the site by TBG. Any observations that suggest the possible presence of dieback will be recorded and investigated. If dieback infestation is suspected affected plant tissues and surrounding soil will be tested by an appropriately qualified laboratory to determine if the pathogen is present.

### **8.6 Fire risk**

The installation and/or maintenance of firebreaks will be inspected annually by the BBG in November to ensure that firebreaks have been maintained to an adequate standard.

Fuel loads will be assessed annually in November to determine whether there is a need for a fuel reduction burn to reduce fire risk. Fuel load will be assessed using the monitoring transects previously described with visual fuel load assessments and leaf litter depth measurements taken every 300m along the transects. Photo-points will also be taken at each monitoring site to allow for verification of the visual fuel load assessments if needed. The mean of the fuel load estimates for each of the three offset blocks will be used to determine the need for fuel reduction burns.

## **8.7 Cockatoo habitat utilisation**

### **8.7.1 Data Collection**

The utilisation of the offset area by black cockatoos will be monitored by bi-annual surveys of the area for evidence of feeding, breeding and roosting by the three target species. These surveys will be done using the same transects previously described (see Figure 5) and will be surveyed between August and October to coincide with the peak of cockatoo breeding (Department of Sustainability, Environment, Water, Population and Communities, 2012).

Additionally TBG will also maintain a database of black cockatoo sightings within the offset area including times, locations and behaviours observed. If any roosting or breeding sites are found within the offset area these sites will also be monitored to assess the numbers of cockatoos utilising the roosts and/or breeding within the offset area.

### **8.7.2 Data analyses**

The amount of cockatoo habitat utilisation will be analysed by linear regression of the number of recorded feeding, roosting and nesting sites against the time since implementation of the plan to determine if utilisation of the area is increasing over time.

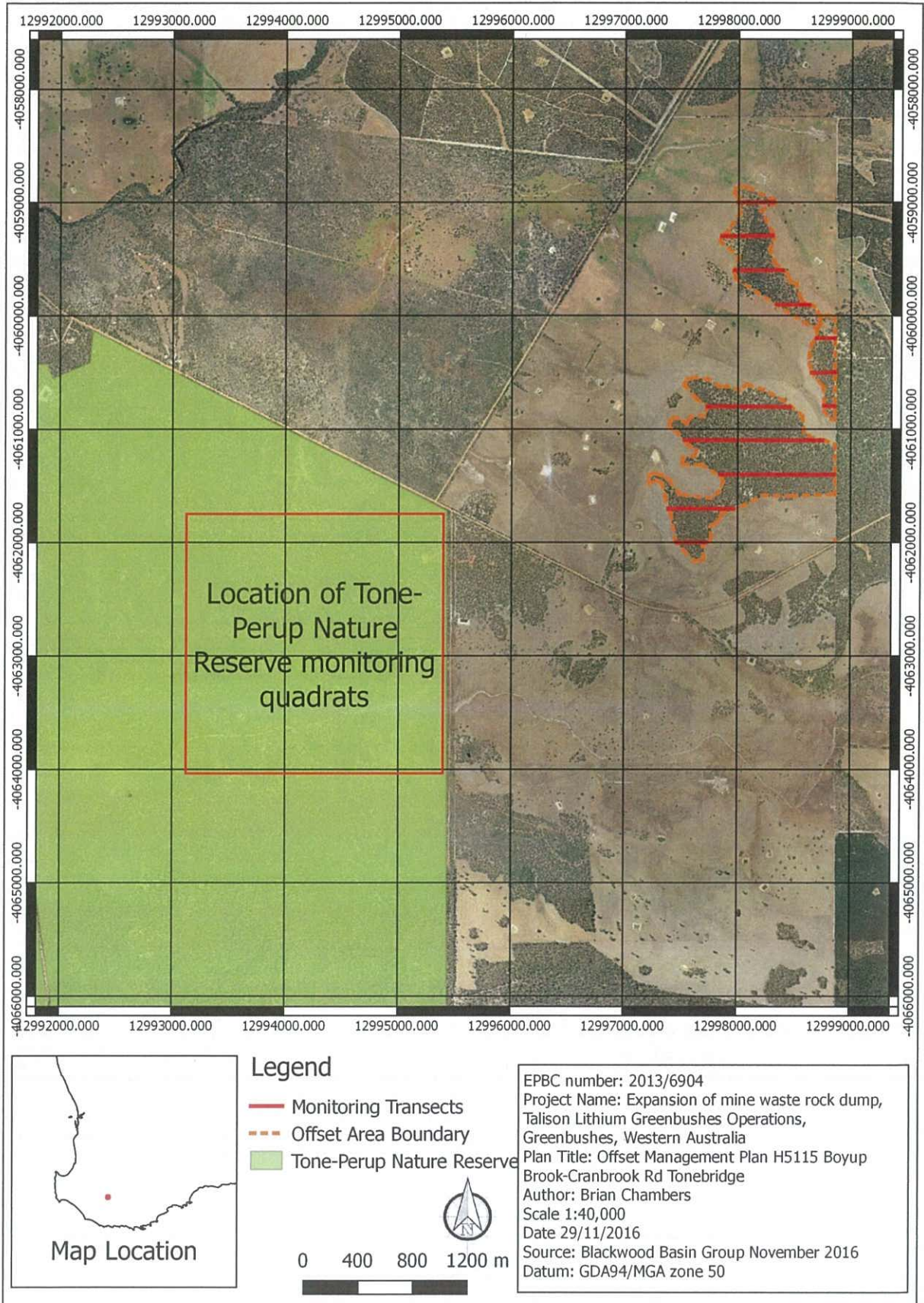


Figure 5. Planned monitoring transect locations for noxious weed surveys, fuel load assessment and cockatoo habitat utilisation monitoring and quadrats for black cockatoo habitat plant density surveys in Tone-Perup Nature Reserve.

Table 7. Monitoring schedule

#	Monitoring activity	Parameter/s measured	Survey/monitoring guidelines	Where	When	Reliability
1	Black cockatoo habitat plants	-Density of black cockatoo habitat plants. -Size (DBH) of habitat plants. -Number of each species of black cockatoo habitat plants present.	-EPBC Act referral guidelines for three threatened black cockatoo species (Department of Sustainability, Environment, Water, Population and Communities, 2012) - Survey guidelines for Australia's threatened birds (Department of the Environment, Water, Heritage and the Arts, 2010)	12 quadrats across 3 offset area blocks.  4 quadrats in Tone-Perup Nature Reserve	Annually  Bi-annually	Very high
3	Fencing	-Number of breeches in fence. -Evidence of livestock intrusion		Offset area boundary	Annually	Very High
5	Infill planting	-Percentage of seedlings surviving 1 year after planting		6, 400m <sup>2</sup> quadrats across planted areas of 3 offset area blocks	1 year after planting	Very high
6	Dieback ( <i>Phytophthora cinnamoni</i> )	-Presence/ absence of phytophthora in offset area. -Total area affected by dieback (contingency).	Managing Phytophthora dieback: Guidelines for Local Government (Dieback Working Group, 2000)		Annually (August-September)	
7	Weeds	-Total area of noxious weed infestation. -Hours of weed control undertaken			Annually (August-September)	
8	Fire risk	Fuel loads (t/ha). Presence of cleared mineral earth firebreaks	Visual Fuel Load Guide for the Swan Coastal Plain and Darling Scarp (Department of Fire and Emergency Services, 2015)		Annually (August-September)	
9	Cockatoo habitat use	-Number of feeding signs observed.  -Number of	-EPBC Act referral guidelines for three threatened black cockatoo species (Department of		Bi-annually (August-September)	High (cockatoo feeding signs are easy to

nesting observations	Sustainability, Environment, Water, Population and Communities, 2012) - Survey guidelines for Australia's threatened birds (Department of the Environment, Water, Heritage and the Arts, 2010)	detect)
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## 9. Reporting

The Blackwood Basin Group will compile an annual report (July to June) of the monitoring results and compliance with the management plan, which will be presented to Talison who will then publish it on their website. This will be done within 3 months of the 1<sup>st</sup> September each year as required under Condition 7 of the approval (variation to condition approved 7<sup>th</sup> March 2017).

The standard annual report content will be as follows:

- Executive summary,
- Summary of previous monitoring results and progress towards project objectives,
- Monitoring methods used,
- Current monitoring results,
- Assessment of current and past monitoring results as they relate to the likelihood of the OMP meeting its defined objectives,
- Assessment of current risks and details of any changes required to address said risks,
- Details of incidents occurring within the last year and corrective actions taken and
- Recommendations for changes needed to the OMP in order to ensure that the goals of the project are met.

Table 8. Reporting schedule

#	Type of report	Approval condition	Timing	Reporting authority	Trigger (if any)
1	Annual compliance report	Within three months following 1 September, each year for the life of this approval, the <b>person taking the action</b> must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions.	Annually, by 1st December	Department of Environment and Energy	

	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 <b>Department</b> at the same time as the compliance report is published. Reports must remain on the website for the life of this approval. The <b>person taking the action</b> must continue to comply with this condition until such time as agreed to in writing by the <b>Minister</b> .			
2	Incident report	With 5 business days	Talison Lithium, Tonebridge Grazing	BBG becomes aware that an incident has occurred
3	Non-compliance report	Within 5 business days	Talison Lithium, Tonebridge Grazing	Monitoring and inspection site-visit where non-compliance is discovered.
4	Corrective actions report	As soon as possible	Talison Lithium	After corrective works completed.

## 10. Review and Audit

### 10.1 Plan Review

This management plan will be reviewed initially after 5 years and then every two years after that to assess whether the management measures in place are on track to achieve the goals of the plan. The Blackwood Basin Group will undertake the review as part of the reporting process in order to determine if there is a need to update the plan.

In addition to this bi-annual process of review the following events will trigger a review of the plan:

- Analysis of past and current monitoring data suggests that the plan is unlikely to achieve its stated goals.
- Recommendations for the management of fuel loads in jarrah forest habitat are revised by the Department of Fire and Emergency Services or the Department of Parks and Wildlife.
- A significant incident such as wildfire or dieback infestation occurs.

## 10.2 Auditing

Should an audit be requested by the Minister, Talison will engage an independent, suitably qualified person to conduct the audit. The audit will not commence until the Minister has approved the appointed person and the criteria to be addressed by the audit.

## 11. Roles, Responsibilities and Implementation Timeline

The responsibility for the implementation for the OMP lies with Talison, Tone Bridge Grazing Pty Ltd and the Blackwood Basin Group who is acting on behalf of Talison to administer the Site Conservation Agreement signed by Talison and Tone Bridge Grazing Pty Ltd. The breakdown of the responsibilities for implementing the management actions, monitoring and reporting are shown in Table 9.

Table 9. Timing and responsibility for implementation of management actions and reporting

Item	Action	Timing	Responsibility
<b>Conservation Covenant</b>	Establish conservation covenant over the offset area.	Before June 30 <sup>th</sup> 2017.	BBG/TBG
<b>Fencing</b>	Install fence around the three blocks that comprise the offset area	June 30 <sup>th</sup> 2017	BBG
	Maintain fences to exclude livestock from offset area	Ongoing	TBG and future landowners
<b>Firebreaks</b>	Establish and maintain a firebreak along the eastern boundary of the offset area	1 <sup>st</sup> December each year	TBG and future landowners
<b>Monitoring</b>	Undertake baseline monitoring	June 30 2017	BBG
	Monitor density of black cockatoo habitat plants	Annually	BBG
	Monitor for presence of noxious weeds in the offset area	Annually	BBG
	Monitor use of the offset area by black cockatoos	Annually	BBG
<b>Reporting</b>	Publish compliance report on Talison website	Annually, by December 1 <sup>st</sup> .	BBG/Talison

<b>Review of OMP</b>	Review and update (if needed) OMP	Annually or if triggered by other event.	BBG
<b>Contingency Measures</b>			
<b>Item</b>	<b>Action</b>	<b>Timing</b>	<b>Responsibility</b>
<b>Infill planting</b>	Undertake infill planting through degraded areas of the offset area (if needed)	July to October 2021	BBG
<b>Dieback control</b>	Fence affected area to exclude wildlife and personnel	Immediately if needed	BBG
<b>Weed control</b>	Undertake weed control (if needed)	July to November in any year that monitoring identifies the presence of noxious weeds, or that non-noxious weeds are impacting regeneration of black cockatoo habitat plants.	BBG



## Glossary of Terms/Acronyms

**BBG** refers to the Blackwood Basin Group.

**Black Cockatoos** are the EPBC Act listed endangered Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, and the EPBC Act listed vulnerable Baudin's Black Cockatoo, *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso*.

**Black Cockatoo habitat** includes foraging and potential breeding habitat as defined in the EPBC Act Referral Guidelines for three species of Western Australian black cockatoos: Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, (Endangered) Baudin's Black Cockatoo, *Calyptorhynchus baudinii* (Vulnerable) and Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso* (Vulnerable) (October 2012).

**Mineral earth firebreak** means a strip of land that is cleared of all vegetation to expose the mineral earth beneath.

**Minister** is the Minister administering the EPBC Act and includes a delegate of the Minister.

**NIASA** means Nursery Industry Accreditation Scheme Australia.

**Offset area** means the 121.7 ha of land consisting of two remnant patches of Marri/Jarraah woodland located between Terrace Road and Boyup Brook-Cranbrook road within the Shire of Boyup Brook, proposed to be established as a conservation estate.

**Project area** means the 85.5 ha of land adjacent to the current Greenbushes mining operation, located between South West Highway and Maranup Ford Road and to the south and southwest of the town of Greenbushes, Western Australia.

**Site Conservation Agreement** means the agreement signed between Talison and Tonebridge Grazing Pty Ltd on October 17<sup>th</sup> 2016 that defined the roles and responsibilities of the two parties in relation to the enacting of a conservation covenant and subsequent management of the offset area.

**TBG** refers to Tonebridge Grazing Pty Ltd.

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## **Appendix 1. Agreement between Talison and Tone Bridge Grazing Pty Ltd.**



Site\_Conservation\_  
Agreement\_signed\_

## **Appendix 2. Agreement between Talison and the Blackwood Basin Group.**



Offset\_Managemen  
t\_agreement\_signed

## **Appendix 3. Draft Conservation Covenant**



Tonebridge\_Draft  
Covenant\_Aerial.pdf

## **Appendix 4. Blackwood Basin Group Weed Hygiene Procedures**



Blackwood Basin  
Group Weed Hygier

## **Appendix 5. Blackwood Basin Group Dieback Hygiene Procedures**



Blackwood Basin  
Group Dieback Hygi

## **Appendix 6. Final Approval Decision Notice**



2013-6904-Final  
Approval-Decision Nc

## **Appendix 7. Approved Variation 7<sup>th</sup> March 2017**



2013-6904 Post  
Approval-Variation Br