


Malleefowl (*Leipoa ocellata*) Management Plan Earl Grey Lithium Project



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EXECUTIVE SUMMARY

This Malleefowl Management Plan is submitted to support environmental referrals under the *Environmental Protection Act 1986* and *Environment Protection and Biodiversity Conservation Act 1999* for the Earl Grey Lithium Project which will be developed by Kidman Resources Limited (Kidman). Table 1 presents the purpose of the Malleefowl Management Plan in the context of Western Australian Environmental Protection Authority (EPA) objectives.

Table 1: Purpose of the Malleefowl MP

Item	Description
Title of proposal	Earl Grey Lithium Project
Proponent name	Kidman Resources Limited
Ministerial Statement number	Not applicable
Purpose of the MP	This Management Plan is submitted to support referrals under the <i>Environmental Protection Act 1986</i> and the <i>Environment Protection and Biodiversity Conservation Act 1999</i> . The purpose of this Malleefowl Management Plan is to provide a framework to ensure that impacts on the Malleefowl attributable to the Earl Grey Lithium Project are minimised and impacts do not conflict with the EPA objective for terrestrial fauna.
Key environmental factor	Terrestrial Fauna - Malleefowl (<i>Leipoa ocellata</i>)
Objective	Terrestrial Fauna: To maintain the representation, diversity, viability and ecological function at the species, population and community levels.

This Malleefowl Management Plan is designed to be adaptive and will be updated over the life of the project (approximately 30 to 40 years) with increased knowledge about Malleefowl in the Great Western Woodlands, and the effectiveness of implemented management measures. Prior to commencement of mining Kidman will update this plan in consultation with all relevant government departments as required. As such this plan remains a working document. Table 2 presents the environmental criteria to measure achievement of environmental objectives through implementation of this Management Plan.

Table 2: Environmental Objectives and Targets

Objectives	Targets
Minimise the potential for clearing activities to cause injury or death to terrestrial fauna, including the Malleefowl.	Minimal deaths due to direct interaction with equipment and machinery.
Minimise the potential of vehicle strike causing injury or death to terrestrial fauna, including the Malleefowl.	Minimal death attributable to vehicle strike.
Minimise entrapment leading to injury or death of terrestrial fauna, including the Malleefowl.	Minimal adult or chick death due to entrapment in drill holes, containers, open excavations, trenches, landfill or water holding facilities.
Minimise requirements for clearing which results in habitat loss and fragmentation	No unauthorised clearing/clearing outside approved clearing areas. Progressive rehabilitation undertaken.
Minimise pollution from light and noise	Compliance with industry requirements for noise and light emissions. Light emissions limited to project.
Minimise increases to predator abundance (cat, dog, fox)	Waste and water sources not available to feral predators. Predator control program implemented. No increase in predator abundance.
No increase in fire frequency or intensity	No fires attributed to mining and associated activities.

The key provisions of the plan to protect terrestrial fauna, including the Malleefowl, are considered to be:

- Monitoring of the Malleefowl population in a manner deemed best practice following consultation with DPaW.
- Implementation of an internal clearing permit procedure.
- Pre-clearance surveys will be undertaken to identify the presence of Malleefowl and mounds in proposed clearing areas.
- All active mounds will be avoided and flagged with appropriately sized buffers determined in consultation with DPaW. Where mounds occur in essential areas (e.g. over the ore body), the following will apply:
 - Clearing will be delayed for a suitable period of time that allows monitoring of the mound, to inform the most appropriate timeframe for clearing;
 - Clearing will preferentially be undertaken outside of the breeding season;
 - If clearing is unavoidable and the mound contains eggs, they will be removed and incubated, with chicks released to suitable habitat close to the Project or to another location as advised by DPaW.
- Development and maintenance of a Malleefowl Register.
- Management of waste facilities (landfills) to reduce attraction of fauna to the Project.
- Implementation of strict traffic management rules to reduce the incidence of vehicle strikes.
- Feral animal control for the Project and coordination with regional programs.
- Staff training and awareness including an induction and Toolbox sessions.
- Progressive rehabilitation, including rehabilitation of some abandoned disturbed areas.

A summary of the location of the complete environmental management provisions of the Malleefowl Management Plan are provided in Table 3.

Table 3: Key Provisions of the Malleefowl Management Plan

Key Provision	Location in Malleefowl MP
Rationale for choosing management based provisions.	Section 1.4
Comprehensive list of management actions.	Section 2.2, Table 5
Comprehensive summary of management targets.	Section 2.3, Table 5

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1. Context, Scope and Rationale

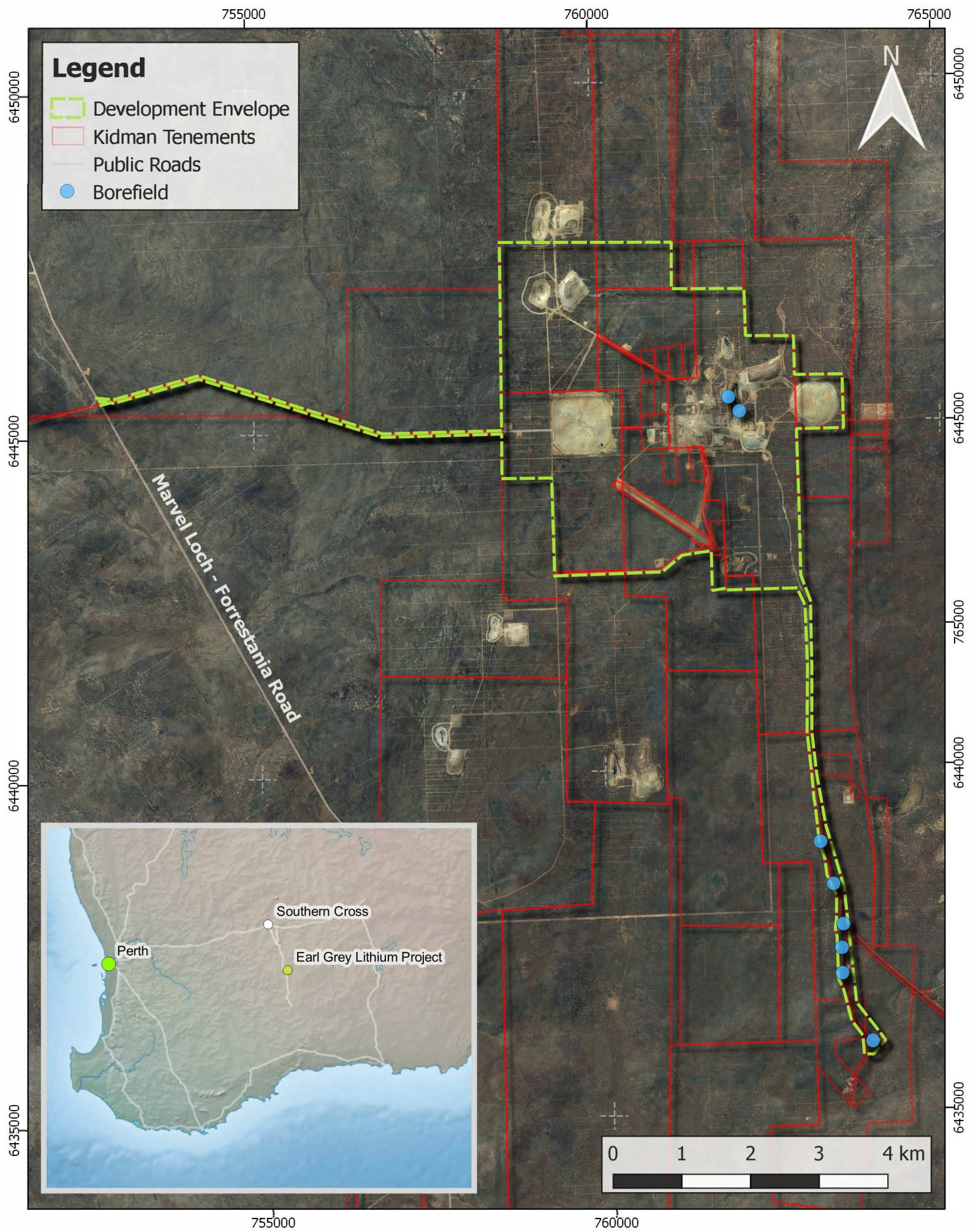
This section includes a summary of the proposed Project and its key features. Information is also provided on the Malleefowl including survey findings, biology and distribution, assumptions and uncertainties, management approach that will be taken and the rationale for the approach.

1.1 Proposal

The Earl Grey Lithium Project (the Project) is located approximately 105 km south-southeast of Southern Cross, Western Australia (Figure 1). A large, economic pegmatite-hosted lithium deposit was discovered by Kidman Resources Limited (Kidman, the Proponent) in 2016. The deposit and proposed operation is situated at the abandoned Mt Holland Mine Site, which was operated between 1988 and 2001, and comprises a number of open pits, an underground mine, a processing plant, waste rock dumps, tailings storage facilities and other infrastructure that is largely un-rehabilitated and currently a liability of the State of Western Australia. Construction of the project is scheduled to commence in Quarter 3 2017, with mining scheduled for Quarter 1 2018. The Project is located on tenure granted under the *Mining Act 1978*. The development envelope and conceptual Project footprint is shown in Figure 2.

The key components of the Project will comprise:

- Progressive mining of the Earl Grey lithium deposit using conventional open cut drill and blast mining methods, over a potential 30 to 40 year life of mine (LOM).
- Processing of lithium ore at a rate of 3 million tonnes per annum, through a newly constructed gravity separation and floatation plant, largely constructed within the historic disturbance footprint.
- Production of a lithium concentrate that will be stored in a concentrate shed prior to being transported by road trains to an existing Western Australian export facility.
- Production of two chemically benign process waste streams, comprising:
 - A gravel sized reject which will be disposed of in waste rock dumps as well as being used for construction purposes (e.g. road base, fill, rehabilitation armouring).
 - A finer grained tailings stream that will be deposited into the abandoned and unrehabilitated Tailings Storage Facility (TSF) 2 (hereby referred to as TSF Option A) or an expansion to the existing in-pit TSF 3 (hereby referred to as TSF Option B), thereby reducing the project footprint and providing a rehabilitation solution to the State liability landform.
- Disposal of unmineralised waste rock to three locations:
 - Stockpiling of waste rock over the abandoned and unrehabilitated Tailings Storage Facility 1 (TSF 1), thereby reducing the disturbance footprint and providing a rehabilitation solution to the State liability landform (hereby referred to as Waste Rock Dump (WRD) 1).
 - Backfilling of the Earl Grey pit as mining progresses from south to north (hereby referred to as WRD 2), thereby reducing the disturbance footprint and the area of open pit remaining at closure.
 - Construction of a new waste rock dump that has been designed to avoid threatened flora species (hereby referred to as WRD 3).
- Construction of a low-grade ore stockpile to the immediate southeast of the proposed pit for processing towards end of LOM.
- Refurbishment of the existing airstrip.
- Construction of other supporting infrastructure (e.g. accommodation village, power station, landfills, administration, workshops, roads, refurbishment of the borefield) predominantly within the historic footprint, thereby reducing new disturbance and providing a rehabilitation solution to a significant portion of the State rehabilitation liability.
- Utilisation of the existing road network.

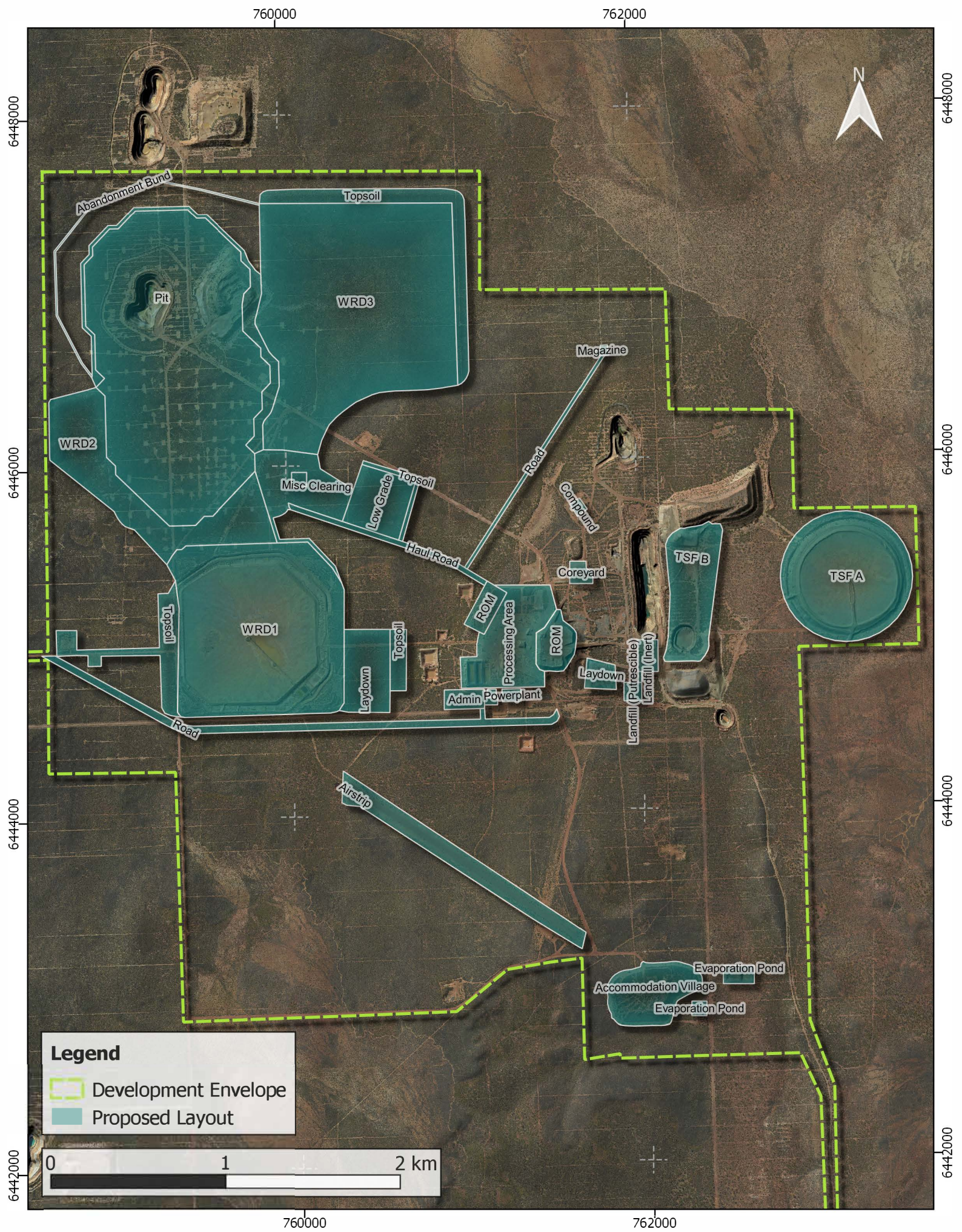


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**Kidman Resources Limited
 Earl Grey Lithium Project**

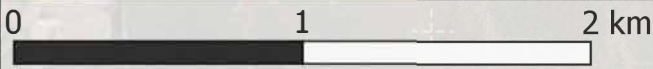
Figure 1
Location Plan

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Legend

- Development Envelope
- Proposed Layout



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Figure 2
Proposed Site Layout

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1.2 Key Environmental Factor: Terrestrial Fauna (Malleefowl)

The EPA's objective for protection of terrestrial fauna is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.

Fauna surveys of the Project area have shown the Malleefowl (*Leipoa ocellata*) to be present. The Malleefowl is a species of conservation significance, listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* and Schedule 3 Vulnerable (fauna that is rare or is likely to become extinct) under the *Wildlife Conservation Act 1950*.

The following aspects of the Project have been identified as having the potential to impact terrestrial fauna, including the Malleefowl:

- Clearing activities causing injury or death – Clearing of vegetation with heavy vehicles may cause direct mortality or injury of Malleefowl.
- Vehicle strike causing injury or death – Species may be at risk of direct mortality or injury by project vehicles.
- Entrapment – Malleefowl may become trapped in containers, uncapped drill holes, trenches, excavations or water storage structures.
- Habitat Loss - Malleefowl are likely to occur throughout the Project areas in all habitats, though they may be temporarily absent in areas that have been recently and extensively burnt. All Malleefowl breeding or foraging habitat in the area is considered 'critical habitat' for this species, and clearing, including the creation of new gaps in an otherwise homogenous habitat area, is regarded as a current threat to this species.
- Habitat Fragmentation – Fragmentation of fauna habitat from land clearing reduces the ability of individual Malleefowl to move freely for dispersed or temporary resources and reduces gene flow. Habitat fragmentation potentially exacerbates other threats, like predation by feral species, by providing access into habitats that were previously dense and difficult to traverse. These impacts are already present in the area due to roads and existing exploration tracks. Fauna are better able to persist in a modified landscape when vegetation patches are large and there are more links between patches.
- Increased Disturbance to Fauna and Fauna Habitats – the Project has the potential to create a range of disturbance to Malleefowl; noise, dust, movement and light from heavy machinery, lighting and the presence of people or vehicles. Malleefowl may avoid disturbance or experience increased stress, expending energy in avoidance behaviours.
- Increased Feral Fauna – Increased human activity can lead to an increase in feral predators which thrive in modified landscapes with additional water sources, food from rubbish tips and increased access along tracks and roads. Feral fauna, particularly predators such as foxes, cats and wild dogs, have the potential to negatively impact the Malleefowl, with predation by feral cats and foxes both recognised as key threatening processes.
- Changed Fire Regimes – Mining activities can cause accidental fires, though the risk is low. Unplanned fires can also be caused by road accidents, lightning or arson. Large, unplanned bushfires are undesirable as they substantially change fauna habitats on a large scale. The Malleefowl is negatively impacted by fire with direct mortality experienced as well as a reduction in habitat including a loss of leaf-litter essential for building mounds.

1.3 Condition Requirements

No specific conditions relating to Malleefowl currently apply to the Project. This Management Plan is submitted with the environmental referrals in order to satisfy the Environmental Protection Authority (EPA) and the Department of the Environment and Energy (DoEE) that Kidman has taken into consideration the environmental objectives set for terrestrial fauna, specifically the Malleefowl, and are committed to implementing the Project in a manner that meets these objectives.

1.4 Rationale and Approach

1.4.1 Survey and Results

Western Wildlife was commissioned to complete a detailed fauna and habitat assessment of the Project area. Three field trips were completed as part of the study as described in Table 4. The surveys covered areas both within and outside of the development envelope and comprised identification of fauna habitats, trapping for terrestrial fauna, bird surveys, bat echolocation survey, spotlighting and targeted searches for evidence of conservation significant species, including transect searches for Malleefowl and Malleefowl mounds.

Table 4: Details of Fauna Surveys Completed in the Project Area and Surrounds

Date	Survey Type	Survey Details
10 – 15 Oct 2016	Reconnaissance survey with targeted searches for Malleefowl in the Earl Grey area (Figure 3, Figure 4).	<ul style="list-style-type: none"> Literature review and database searches. Opportunistic records taken. Habitats of the Earl Grey study area recorded and mapped. Deployment of 12 baited camera traps established for 5 nights totaling 60 trap nights at Earl Grey. Malleefowl: 269 km of transects completed by 4 personnel at 10 m spacing (Figure 4).
21 Nov – 4 Dec 2016	Detailed survey (trapping and targeted searches), encompassing four study areas, including Early Grey and Irish Breakfast which occur within the development envelop (Figure 3). Prince of Wales and Van Uden study areas fall outside the development envelop, however provide further regional context to the fauna and habitat assessment.	<ul style="list-style-type: none"> Trapping – 12 sites established (Figure 3) comprising: <ul style="list-style-type: none"> 10 pitfall traps, 10 baited funnel traps, 10 baited Elliott traps and 2 baited cage traps for 8 nights. Each site had 80 pitfall trap-nights, 80 funnel trap-nights, 80 Elliott trap-nights and 16 cage trap-nights. The survey had 960 trap-nights for pitfalls, funnels and Elliott traps, and 192 trap-nights for cages. Birds: 7 x 20 minute surveys undertaken at each trapping site. Bats: SM2 ultrasonic bat detectors deployed for 1 night at each trapping site and the camp. Spotlighting: 2 nights, 6 people in 3 teams using road-spotting and head-torching. Opportunistic records taken. Habitats recorded and mapped. Deployment of 45 baited camera traps for 4 or 5 trap nights totaling 189 trap nights (Figure 3). Malleefowl: Irish Breakfast: 138 km of transects completed by 6 personnel at 10 m spacing. Prince of Wales: 176 km of transects completed by 6 personnel at 10 m spacing (Figure 4). Van Uden: Opportunistic only (Figure 3)
15 Jan – 25 Feb 2017	Regional camera trapping.	<ul style="list-style-type: none"> Deployment of 44 baited camera traps deployed for 13 to 24 nights resulting in 794 trap nights (Figure 3). Vegetation and habitat descriptions taken at camera trap locations. Malleefowl: Opportunistic only.

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- Cage Trap Site
- Camera Trap Site
- Development Envelope



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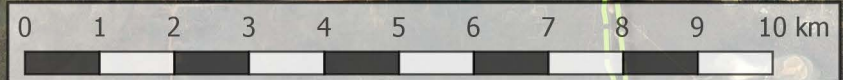
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Prince of Whales

Earl Grey & Irish Breakfast

Van Uden



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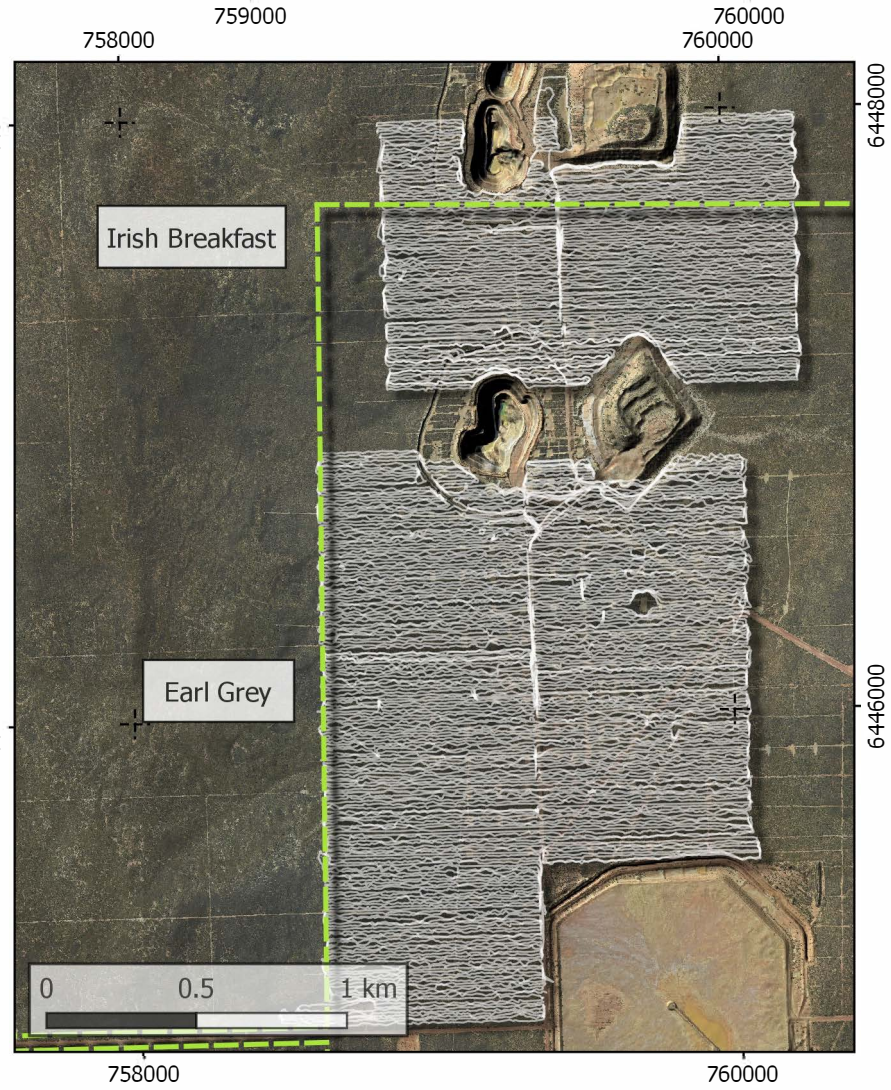
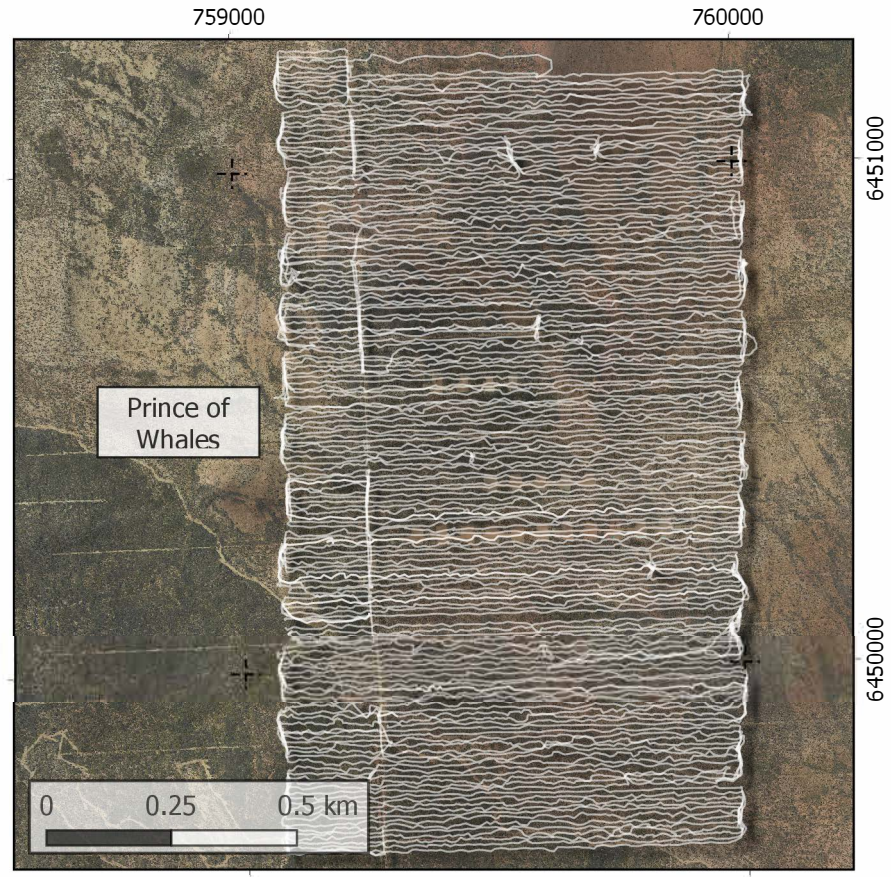
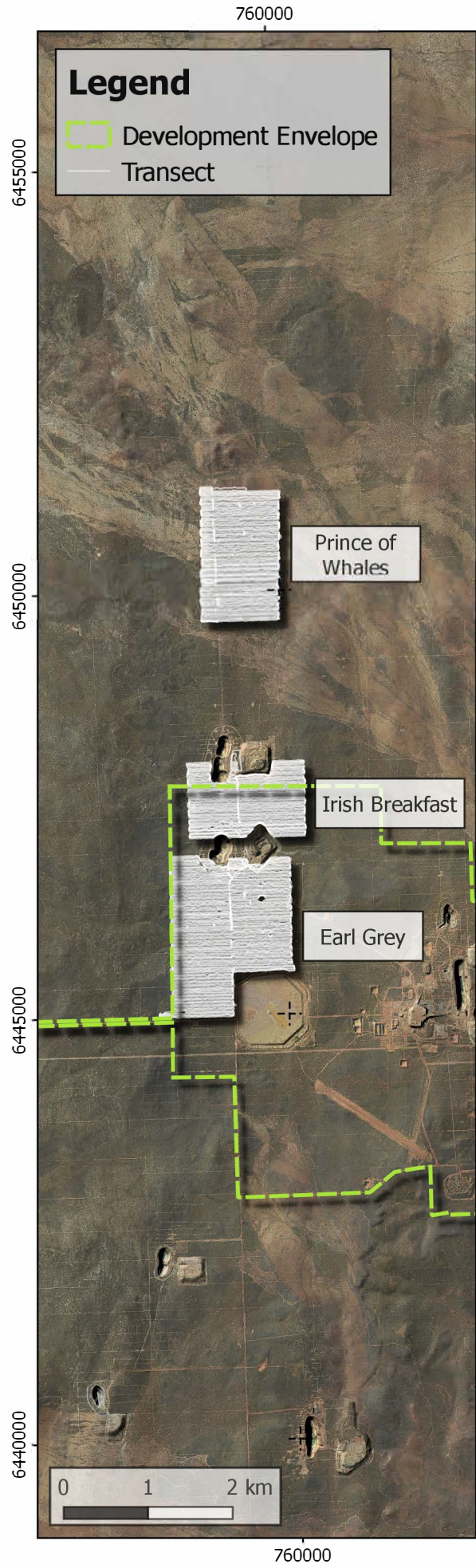
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Figure 3
Locations of Study Areas,
Trap Sites & Camera
Traps

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Kidman Resources Limited
Earl Grey Lithium Project

Figure 4
Malleefowl Transects

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Malleefowl were recorded in all three surveys, with results summarised as follows:

- One active mound was recorded in the development envelope and three outside of the development envelope.
- Eight inactive mounds (including mound attempts) were recorded in the development envelope and nine outside of the development envelope.
- One bird was sighted in the development envelope and four outside of the development envelope.
- Malleefowl were recorded in a range of habitats across the study areas, including mallee woodlands, open woodlands and shrublands. It is likely that all vegetation in the study areas is foraging habitat for Malleefowl.
- Active mounds accounted for 19 % of all mounds recorded (4 out of 21).
- All active mounds recorded were in unburnt habitat, and three of the four were alongside tracks.
- Inactive mounds in burnt areas are unlikely to be used again until after the vegetation has regenerated sufficiently to provide leaf litter for use in nest mound construction.
- The fauna survey showed the Project area and surrounds support a breeding population of Malleefowl.
- Breeding habitat in the study areas is widespread but patchy. Mounds were generally found in patches of tall shrubland in sparse mallee woodland, with a gravelly sand substrate.
- Areas of long-unburnt mallee woodland and shrublands are considered regionally important for maintaining Malleefowl populations, because of widespread fires in the region and the length of time it takes for burnt areas to return to conditions suitable for breeding.

The distribution of all Malleefowl records from the fauna survey are shown on Figure 5. The distribution of surveyed mounds reflects the survey effort; Earl Grey, Irish Breakfast and Prince of Wales were intensively searched via 10 m transects so it is considered the inventory of mounds within these areas is near-complete. The remaining areas were sampled opportunistically, so it is likely that a number of mounds remain unrecorded (Western Wildlife 2017).

1.4.2 Malleefowl Biology and Behaviour

The National Recovery Plan for Malleefowl (Benshemesh 2007) provides extensive information on the species. Below is a brief summary of relevant information, please refer to the full plan for a more detailed summary.

The Malleefowl belongs to the Megapodiidae family, the mound builders, who incubate their eggs in a nest (mound) constructed of sand and leaves. Mounds are constructed intermittently by a pair of birds between autumn and spring from leaf litter on sandy substrates (Garnett and Crowley 2000). The female lays 15 to 25 eggs between early spring and mid to late summer, while the male tends the mound. Chicks emerge between November and January (or as late as March), and as they receive no parental care, chick mortality can be high. Eggs and chicks are vulnerable to predation by feral predators.

Malleefowl often breed in the same general area each year. New mounds may be constructed or old mounds re-used. Adult birds range over one to many square kilometres, and these home ranges overlap (Benshemesh 2007).

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Legend

- ▲ Active Mound
- ▲ Inactive Mound
- Camera Location (Malleefowl Recorded)
- Camera Location (No Malleefowl Recorded)



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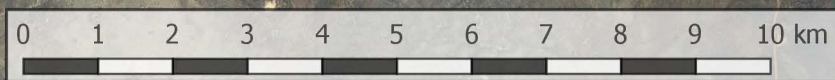
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**Kidman Resources
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Earl Grey Lithium Project

Figure 5
**Malleefowl Survey
 Results**

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1.4.3 Malleefowl Distribution

The Malleefowl is a bird of dense shrublands, mulga woodlands and mallee woodlands (Johnstone and Storr 1998). The pre-European Malleefowl distribution covered much of the southern half of the continent from the west coast to the Great Dividing Range in the east, being widespread in every mainland state except Queensland. Over the last century the range of Malleefowl has contracted, particularly in arid areas and at the periphery of its former range. Malleefowl densities are now the highest in the semi-arid zone. This contraction in range is attributed to habitat loss, fragmentation and degradation of remaining habitat, death of adults on roads, feral predators and fire killing adult birds, causing local extinctions in fragmented habitats and preventing breeding for many years after a fire (Benshemesh 2007).

Many historical records of Malleefowl were identified within 90 km of the Project showing Malleefowl are likely to occur throughout the woodlands and shrublands of the region. The Malleefowl was recorded in the Project area and surrounds including sightings of birds and active mounds. Birds likely forage in most habitats including recently burnt habitats, but unburnt areas of shrublands or woodlands on gravelly sands are required for mound construction. As Malleefowl have large overlapping home-ranges of one to many square kilometres, those surveyed in the study areas are likely to range over all habitats (Western Wildlife 2017).

1.4.4 Key Assumptions and Uncertainties

Key assumptions:

- The Project area has been adequately surveyed for terrestrial fauna, with three surveys undertaken comprising a detailed fauna survey, and targeted malleefowl searches.
- Fauna surveys were completed in compliance with EPA and DoEE requirements (EPA 2002, EPA 2004, EPA & DEC 2010, EPA 2016a, DoEE 2011).
- The surveys provide sufficient information to confirm Malleefowl presence, and suggest a healthy population exists within and outside the Project.
- The Malleefowl population surveyed indicates a combination of favourable factors; dense unburnt habitat providing abundant food sources, breeding sites and protection from feral predators, in association with low numbers of feral predators; foxes, cats and wild dogs which may be attributed to feral animal control programs in the area.
- The lack of Malleefowl and inactive mounds in some areas surveyed indicate the species is variable in time and space, its absence may be a response to fire which reduces habitat provisions of food sources, litter for mounds and shelter from predators.
- Malleefowl are unlikely to be utilising areas of existing disturbance due to lack of suitable habitat for foraging or nesting.
- Malleefowl are likely to extend further to the east, south and north of the survey area. It is assumed that by utilising areas of existing disturbance and minimizing clearing, as well as progressively rehabilitating the pit, and rehabilitating existing liabilities, the impacts of the project to the Malleefowl will be minimized.

Key uncertainties:

- Malleefowl are highly mobile, they were recorded in all habitats and all vegetation in the region is considered to be suitable foraging habitat.
- Breeding habitat is present throughout the area in discrete patches.
- The level of survey varied between different areas; the regional area survey was opportunistic only, so it is considered likely there are many more active and inactive mounds in this area.

- The extent of the Malleefowl population beyond the areas surveyed in baseline assessments, and in the greater regional area is generally unknown.
- Over a 30 – 40 year life of mine, new mounds may be constructed. Therefore, all proposed clearing areas will be subject to pre-clearance searches.

1.4.5 Management Approach

The management approach taken in this Management Plan is risk-based and developed around the mitigation hierarchy of avoid, minimise, rehabilitate and off-set to ensure impacts to the Malleefowl have been avoided or reduced to as low as reasonably practicable.

Management actions detailed in this Management Plan have been specifically designed to ensure the Project meets its environmental objectives for the key environmental factor. Risks and management actions were identified and prioritised using information gained from baseline surveys and other regional and local information within the public domain including the National Recovery Plan for Malleefowl *Leipoa ocellata* (Benshemesh 2007) ensuring the approach aligns with any regional and national framework.

1.4.6 Rationale for Choice of Provisions

The management approach is informed by results of baseline surveys and the Project parameters. The Project will have a small footprint over a long life of mine with priority use of existing disturbed areas and progressive rehabilitation, including rehabilitation of existing State liabilities.

Management and mitigation measures have been designed for the long term life of mine, and as such, may require adaptive solutions in subsequent revisions.

2. Malleefowl Management Plan Provisions

This section identifies the provisions that Kidman proposes to implement to ensure protection of terrestrial fauna, with a focus on the Malleefowl. It states the management objective, identifies management actions that will be implemented to mitigate and manage potential risks to terrestrial fauna including the Malleefowl, and management targets that will be used to measure the efficacy and performance of management actions. A monitoring framework for tracking performance against management targets is also included in Section 3.

This Management Plan utilises management-based provisions because Malleefowl, as an ecological factor, is difficult to objectively measure and report on. This section details management-based actions, targets, a monitoring framework and reporting requirements to ensure the protection of the Malleefowl from the risks associated with the project.

2.1 Objective

The objective of this MP is to ensure the Project is managed to maintain the local Malleefowl population, its diversity, variability and ecological function at the species, population and community level, in compliance with the EPA objective for terrestrial fauna (EPA 2016).

2.2 Management Actions

Management objectives have been identified to address potential impacts detailed in Section 1.2. To meet the management objectives, a series of project specific, risk-based management actions have been developed and prioritized based on risk to minimise potential impacts to terrestrial fauna, including the Malleefowl. The management actions focus on proposal activities that have the highest likelihood of causing adverse impact to the Malleefowl. These management actions were specifically developed to meet the EPA's objective for terrestrial fauna by Kidman for the Earl Grey Lithium Project.

Management objectives, targets, actions and reporting are listed in Table 5. Risk assessment tables are provided as Appendix 1. The risk rating remains Medium for two management objectives related to clearing:

- Clearing activities causing injury or death – Mounds will be avoided wherever possible, however some mounds may be identified in essential areas and need to be cleared. In this instance pre-clearance surveys will identify mounds and clearing will be undertaken outside of the breeding season to prevent impacts to breeding birds.
- Habitat loss and fragmentation – Although the project footprint is small and land clearing requirements are low, all habitat surveyed is considered suitable for this species, and clearing is regarded as one of the greatest threats to this species.

Although some impacts may be experienced through clearing, the Project offers an opportunity to rehabilitate historic disturbed areas that are currently a State liability, resulting in a net gain of habitat to Malleefowl in the long term.

2.3 Management Targets

Measurable management targets have been developed to ensure management actions are effective. If management targets are met, then impacts on the local terrestrial fauna population, including the Malleefowl population, will be minimised and the EPA's environmental objective for terrestrial fauna will be achieved.

As discussed in Section 2.2, land clearing activities pose the greatest potential impact on terrestrial fauna, including the Malleefowl through reduction in habitat and loss of active mounds. This impact is anticipated to be minimised by limiting the amount of clearing and implementing progressive rehabilitation.

Management objectives, targets, actions and reporting are listed in Table 5. Monitoring is described in Section 3.

Table 5: Objectives, Targets, Actions, Timeframe and Reporting

Management Objective	Management Targets	Management Actions	Timeframe/Phase	Records and Reports
Minimise the potential for clearing activities to cause injury or death to terrestrial fauna, including the Malleefowl.	<p>Minimal Malleefowl deaths due to direct interaction with equipment and machinery.</p> <p>No unauthorised clearing of active Malleefowl mounds.</p>	<ul style="list-style-type: none"> • Avoid unauthorised clearing through implementation of an internal clearing permit procedure. • Avoid disturbance to active Malleefowl mounds: <ul style="list-style-type: none"> – Pre-clearance surveys will be completed prior to all clearing to record the presence/absence of Malleefowl and mounds in the area to be cleared. – Buffers (to be determined in consultation with DPaW) will be applied to active/recently active mounds to be flagged in the field as no-go zones. • All active mounds will be avoided and flagged with appropriately sized buffers determined in consultation with DPaW. Where mounds occur in essential areas (for instance over the ore body), the following will apply: <ul style="list-style-type: none"> – Clearing will be delayed for a suitable period of time that allows monitoring of the mound, to inform the most appropriate timeframe for clearing; – Clearing will preferentially be undertaken outside of the breeding season; – If clearing is unavoidable and the mound contains eggs, they will be removed and incubated, with chicks released to suitable habitat close to the project or as to another location as advised by DPaW. • All Malleefowl, active and inactive mounds will be recorded in a “Malleefowl Register” which will include date, observer, status of mound/Malleefowl and a GPS/location description. • A suitably qualified environmental professional (fauna spotter) will be present during all land clearing. The person will hold a permit to handle and move significant fauna under Regulation 15 of the <i>Wildlife Conservation Act 1950</i>, and have access to a care facility that can be used to rehabilitate injured fauna. • Monitoring of the Malleefowl population via mounds will be conducted in consultation with DPaW and will adopt the National Malleefowl Monitoring Procedure (NMRT 2016). Monitoring will identify any decline and determine, where possible, the cause, and if it is considered to be project related, remedial actions will be investigated and discussed with DPaW and any other identified party of interest. 	All phases	<p>Internal audits /inspections of areas before and after clearing.</p> <p>Incident reporting of Malleefowl death, active mound destruction, unauthorised clearing and over-clearing.</p> <p>Internal clearing permits. Clearing register.</p> <p>Pre-clearance survey reports.</p> <p>Annual Environmental Report.</p> <p>Malleefowl Register.</p> <p>Monitoring report (following consultation with DPaW).</p>

Management Objective	Management Targets	Management Actions	Timeframe/ Phase	Records and Reports
Minimise the potential of vehicle strike causing injury or death to terrestrial fauna, including the Malleefowl.	Minimal Malleefowl death attributable to mining vehicle strike.	<ul style="list-style-type: none"> Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules (e.g. keeping to designated tracks, limited driving between dusk and dawn, driving to road and weather conditions, reduced speed limits, Malleefowl signage). All sightings and interactions with the Malleefowl to be reported to the Environmental Department. Environmental personnel to identify and link with local wildlife carers/vets for injured Malleefowl. Staff training and awareness to provide information on the Malleefowl (e.g. how to identify adults, chicks and mounds, conservation status, the importance of minimising impacts on the species, adherence to speed limits, reporting to Environmental Department). 	All phases	<p>Incident reports of speeding, unauthorised driving and Malleefowl death and injury.</p> <p>Annual Environmental Report.</p> <p>Internal audits and inspections of vehicle speeds.</p> <p>Malleefowl Register of all sightings, mounds and injured/deceased birds.</p> <p>Monitoring report (following consultation with DPaW).</p>
Minimise entrapment leading to injury or death of terrestrial fauna, including the Malleefowl.	Minimal Malleefowl death due to entrapment in drill holes, containers, bins, open excavations, trenches, landfill or water holding facilities.	<ul style="list-style-type: none"> Avoid accidental death and/or entrapment of fauna by installing egress points and/or fauna ladders in excavations and dams and/or regularly inspecting such facilities. Open holes, including drill holes, to be covered or capped during construction or rehabilitated when they are no longer required. Domestic waste facilities will be fenced and putrescible wastes will be regularly covered. Containers to have doors closed securely when not in use. 	All phases	<p>Incident reports for entrapped fauna.</p> <p>Internal audits and inspections of site high risk areas for potential for entrapment and death.</p> <p>Annual Environmental Report.</p> <p>Monitoring report (following consultation with DPaW).</p>

Management Objective	Management Targets	Management Actions	Timeframe/Phase	Records and Reports
Minimise requirements for clearing which results in habitat loss and fragmentation.	No clearing outside approved areas. Progressive rehabilitation undertaken.	<ul style="list-style-type: none"> Avoid clearing of fauna habitat and minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas. Internal clearing permit procedure to be developed and implemented (to include flagging of clearing areas by surveyors, supervision of clearing by a suitably qualified environmental professional, reporting of over-clearing). Progressive land clearing with the amount of active disturbance minimised. Progressive rehabilitation in accordance with a Mine Closure Plan. Completion criteria will incorporate fauna and habitat restoration objectives. Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock. Where possible, direct placement of topsoil and vegetation will be respread over rehabilitated areas. The site layout will be compact, reducing fragmentation, and allowing fauna to move through the landscape on all sides of the project. 	Planning Construction Operation	<p>Clearing Register.</p> <p>Internal clearing permits.</p> <p>Survey data.</p> <p>Annual Mine Plan.</p> <p>Incident reports for over-clearing.</p> <p>Annual Environmental Report.</p> <p>Monitoring report (following consultation with DPaW).</p>
Minimise pollution from light and noise.	Minimal disruptions to fauna from noise and light emissions.	<ul style="list-style-type: none"> Project travel between dusk and dawn will be limited to essential travel. Lights will be strategically placed and designed to shine towards plant operations and minimise light spill to the surrounding environment. Equipment design will specify compliance with Australian Standard noise limits. 	All phases	<p>Incident reports for light spill and noise violations.</p> <p>Annual Environmental Report.</p> <p>Monitoring report (following consultation with DPaW).</p>

Management Objective	Management Targets	Management Actions	Timeframe/ Phase	Records and Reports
<p>Minimise increases to feral predator abundance (cat, dog, fox) and herbivorous competitors.</p>	<p>Waste and water sources not available to feral predators. Predator control program implemented. Minimal increase in predator abundance.</p>	<ul style="list-style-type: none"> Avoid attraction of both feral and native species to the project footprint by implementing domestic waste management procedures (e.g. fencing of landfills, regularly covering putrescible waste, secure lids on bins, borrow pits designed to avoid ponding water). Kidman will undertake pest animal control on site in cooperation with regional control programs where appropriate. Kidman will undertake monitoring of feral predator abundance to determine control program effectiveness. Kidman will consider contributing to the Western Shield program as a sponsor, as an offset or to provide predator control services. Staff training and awareness to include information on feral species (e.g. impact on the Malleefowl, no feeding of feral species and all sightings of feral species to be reported). 	<p>All phases</p>	<p>Opportunistic observations.</p> <p>Incident reports of Malleefowl predation.</p> <p>Internal audits and inspections.</p> <p>Predator control to include monitoring of predator species.</p> <p>Annual Environmental Report.</p> <p>Monitoring report (following consultation with DPaW).</p>
<p>No increase in fire frequency or intensity.</p>	<p>No fires attributed to mining and associated activities.</p>	<ul style="list-style-type: none"> Avoid increases in fire frequency through maintenance of fire breaks and implementation of fire management procedures (e.g. Hot Work Permit system, fire-fighting training, Emergency Response Plan). Firefighting equipment will be located on site, in machinery and vehicles. Lightning protection equipment will be installed as part of project design where necessary. Vehicles will not be permitted to leave access tracks or cleared areas. Kidman will work with DPaW and DFES to undertake prescribed burns. Kidman will contribute to fire management in the region. Staff training and awareness to include information on the prevention and management of fires. 	<p>All phases</p>	<p>Aerial photography.</p> <p>Annual Environmental Report.</p> <p>Incident reports.</p>

3. Monitoring

The following monitoring will be undertaken for the Malleefowl Management Plan:

- Internal audit and inspection of areas of clearing, areas of potential entrapment, speeding and night driving.
- Monitoring of incident reports for Malleefowl predation, vehicle strike, speeding and night driving, over-clearing, light and noise disturbance and fire.
- Monitoring of the existing feral fauna populations (focussing on the fox and cat population). This information is intended to provide a baseline for comparison of feral animal numbers over the life of mine. Best practice techniques developed following consultation with DPaW. The information will also guide any feral control programs implemented in the Project area.
- Monitoring of clearing through the clearing register, survey data and aerial photography.
- Monitoring of Malleefowl population using best practice techniques developed in consultation with DPaW, potentially monitoring mounds during transect surveys. Monitoring will potentially record the number of Malleefowl mounds, identify any decline in active mounds, and determine the cause. If it is considered to be Project related, remedial actions will be investigated and discussed with DPaW and any other identified party of interest.

Where there is evidence of management targets not being met, or a trigger value being breached – for instance a Malleefowl being killed, management measures will be reviewed to ensure further deaths do not occur.

4. Reporting

The Malleefowl Management Plan sets out the reporting requirements relating to the implementation of the plan. Reporting includes:

- Preparation of an Annual Environmental Report (AER) to be submitted to the appropriate regulatory authorities. The AER will include monitoring results and trends as compared to trigger and threshold criteria.
- Provision of data (annually) from monitoring programs to DPaW and DoEE, as well as the National Malleefowl Monitoring Database.
- In the event that the management target is exceeded (or not met), the relevant authority will be notified within 7 days of identification of the exceedance, including threshold contingency actions which have been implemented due the exceedance of threshold criteria.

5. Adaptive Management and Review of the management Plan

This Management Plan has defined the issue (Section 1.2), outlined management and mitigation measures to address the issue (Section 2), and introduced monitoring and evaluation of these measures (Section 2.3).

The management approach for the Malleefowl at the Project will be adaptive. The Malleefowl Management Plan will be formally reviewed annually by a suitably qualified experienced person. In addition to annual review, the Malleefowl Management Plan will be reviewed if:

- New information is learned from monitoring, or monitoring indicates that management targets are not being achieved.
- New information becomes available about the Malleefowl, for instance a change in conservation status.
- There is a change in the project description, for instance an increase in the size of the disturbance.

6. Stakeholder Consultation

Stakeholder consultation that is relevant to this management plan is summarised in Table 6.

Table 6: Stakeholder Consultation

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of Mines and Petroleum (DMP)	16/02/2017	Meeting	DMP: Ian Mitchell (Team Leader – Operations, Environment), Richard Smetana (Environmental Officer). Kidman: Chris Williams (General Manager), Siobhan Pelliccia (Environmental Advisor, Blueprint Environmental Strategies).	Overview of project presented to DMP, focusing on proposed operations, environmental setting, baseline study results, presence of Chuditch, Malleefowl and threatened flora, opportunities for rehabilitation of abandoned mine site.	DMP commented on the potential positive outcomes associated with rehabilitation of historic disturbances. DMP suggested a pre-referral meeting be held with the Office of the Environmental Protection Authority to discuss conservation significant species.
Office of the Environmental Protection Authority (OEPA) and DMP	9/03/2017	Meeting	OEPA: Robert Hughes (Manager, Mining and Industrial South Branch) Helen Butterworth (Acting Principal Environmental Officer, Mining and Industrial South Branch). DMP: Ian Mitchell Kidman: Chris Williams, Siobhan Pelliccia and James Cumming (Environmental Advisor, Blueprint Environmental Strategies).	Kidman delivered a presentation that provided details on: the Project (location, access, history); the abandoned mine status of the project; the proposed mining operation; the environmental setting, completed baseline studies and preliminary impact assessment; potential impacts on threatened species, focusing on the Chuditch, Malleefowl and Banksia; consultation that has occurred to date; the approvals pathway.	The OEPA recommended that Kidman consult with the Department of Parks and Wildlife the Commonwealth Department of the Environment and Energy, due to the presence of conservation significant species. DMP reaffirmed that any Mining Proposal would be referred to DPaW and/or the OEPA for advice due to the presence of conservation significant species.
DPaW – Environmental Management Branch	9/03/2017	Phone Call	Kidman: Siobhan Pelliccia (Blueprint) to DPaW: Daniel Coffey.	Informed DPaW of meeting with the OEPA and DMP and requested a meeting to discuss the conservation significant species in the Project area.	DPaW communicated that although the Project was of interest, DPaW could not meet with proponents unless their project was located in DPaW managed land, or a formal request was made by DMP or the OEPA through a formal process.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of the Environment and Energy (DoEE)	20/03/2017	Meeting in Canberra	<p>DoEE: Dionne Cassanell (Senior Assessment Officer, Project Assessments West Section), Angela Gillman (Assistant Director, Project Assessments West Section), Karen Mexon (Assessment Officer), Cassandra Elliott (Assessment Officer).</p> <p>Kidman: Chris Williams, Michael Green (Exploration Manager), Siobhan Pelliccia, James Cumming</p>	Summary of project presented to DoEE (as described above for the OEPA) with a focus on matters of national significance, including the Chuditch, Malleefowl and <i>Banksia sphaerocarpa var. dolichostyla</i>	Discussed possible approval pathways. DoEE commented that provision of fauna management plans would assist in the assessment process. DoEE would want to have a clear understanding of impacts and measures to avoid or minimise impacts and any residual impact remaining after implementation of management measures.
DPAW – Western Shield Group	5/05/2017	Meeting	<p>DPAW: Ashley Millar</p> <p>Kidman: Chris Williams, Siobhan Pelliccia, Jill Woodhouse (Environmental Advisor) and Jenny Wilcox (Western Wildlife – Lead Zoologist)</p>	Overview of Project presented with focus on findings of fauna survey, in particular, occurrence of Malleefowl and Chuditch.	Information on the Western Shield Program and ways in which Kidman can assist in the program through sponsorship and provision of survey results.
Non-Government Organisations	17/05/2017	Letters	<p>Conservation Council of WA: Piers Verstegen (Director)</p> <p>National Malleefowl Recovery Team: Tim Burnard (National Coordinator)</p> <p>Wilderness Society: Peter Robertson (State Coordinator)</p>	Introduction to Kidman and the Project. Recognition of stakeholder status. Invitation to meet to discuss the Project.	No comments received at time of submission.

7. References

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Western Wildlife (2017) *Mt Holland Project: Earl Grey, Irish Breakfast, Prince of Wales, Van Uden. Level 2 Fauna Survey and Targeted Malleefowl Survey 2016*. Unpublished Report for Kidman Resources Limited.

APPENDICES

APPENDIX 1: RISK ASSESSMENT TABLES

Table A1-1: Risk Consequence and Likelihood Definitions

Consequence Ranking			Likelihood Ranking		
1	Insignificant	No detectable impact on population: <i>Insignificant amount of poor quality habitat cleared; Individual mortality due to roadkill</i>	A	Almost Certain	The incident is expected to occur most of the time/every time.
2	Minor	Short-term or local impact to population: <i>Removal of a small area of habitat for a short period of time; A small number of Malleefowl fatalities, for instance a number of recently hatched chicks.</i>	B	Likely	The incident will probably occur in most circumstances/ regularly/ weekly.
3	Moderate	Long-term detrimental, but recoverable, impact on population: <i>Removal of a large area of habitat that will be rehabilitated as suitable habitat in the future; Death of a number of individuals that make up a local population.</i>	C	Moderate	The incident should occur at some time/ quarterly.
4	Major	Long-term detrimental impact on the population, which may not be recoverable, and the population is threatened with extinction: <i>Removal of habitat to the threshold required to maintain a viable population, without rehabilitation; Death of a large number of Malleefowl which make up the regional population.</i>	D	Unlikely	The incident could occur at some time in the life of the project.
5	Catastrophic	Non-recoverable population decline leading to extinction: <i>Excessive removal of habitat beyond the threshold required to maintain a viable population; Death of all Malleefowl.</i>	E	Rare	The incident may occur only in exceptional circumstances and may never happen.

Table A1-2: Risk Assessment Categories

		Consequences				
		1	2	3	4	5
Likelihood		<u>INSIGNIFICANT</u>	<u>MINOR</u>	<u>MODERATE</u>	<u>MAJOR</u>	<u>CATASTROPHIC</u>
A	<u>ALMOST CERTAIN</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>	<u>H</u>
B	<u>LIKELY</u>	<u>M</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>
C	<u>MODERATE</u>	<u>L</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>
D	<u>UNLIKELY</u>	<u>L</u>	<u>M</u>	<u>M</u>	<u>H</u>	<u>H</u>
E	<u>RARE</u>	<u>L</u>	<u>M</u>	<u>M</u>	<u>M</u>	<u>H</u>

Table A1-3: Management Plan Risk Assessment

Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/Phase
<p>Minimise the potential for clearing activities to cause injury or death to Malleefowl</p>	<p>HIGH 3A</p>	<ul style="list-style-type: none"> • Avoid unauthorised clearing through implementation of an internal clearing permit procedure. • Avoid disturbance to active Malleefowl mounds: <ul style="list-style-type: none"> – Pre-clearance surveys will be completed prior to all clearing to record the presence/absence of Malleefowl and mounds in the area to be cleared. – Buffers (to be determined in consultation with DPaW) will be applied to active/recently active mounds to be flagged in the field as no-go zones. • All active mounds will be avoided and flagged with appropriately sized buffers determined in consultation with DPaW. Where mounds occur in essential areas (for instance over the ore body), the following will apply: <ul style="list-style-type: none"> – Clearing will be delayed for a suitable period of time that allows monitoring of the mound, to inform the most appropriate timeframe for clearing; – Clearing will preferentially be undertaken outside of the breeding season; – If clearing is unavoidable and the mound contains eggs, they will be removed and incubated, with chicks released to suitable habitat close to the project or as to another location as advised by DPaW. • All Malleefowl, active and inactive mounds will be recorded in a “Malleefowl Register” which will include date, observer, status of mound/Malleefowl and a GPS/location description. • A suitably qualified environmental professional (fauna spotter) will be present during all land clearing. The person will hold a permit to handle and move significant fauna under Regulation 15 of the <i>Wildlife Conservation Act 1950</i>, and have access to a care facility that can be used to rehabilitate injured fauna. • Monitoring of the Malleefowl population via mounds will be conducted in consultation with DPaW and will adopt the National Malleefowl Monitoring Procedure (NMRT 2016). Monitoring will identify any decline and determine, where possible, the cause, and if it is considered to be project related, remedial actions will be investigated and discussed with DPaW and any other identified party of interest. 	<p>MEDIUM 2D</p>	<p>All phases</p>

Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/ Phase
Minimise the potential of vehicle strike causing injury or death to Malleefowl	MEDIUM 2B	<ul style="list-style-type: none"> Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules (e.g. keeping to designated tracks, limited driving between dusk and dawn, driving to road and weather conditions, reduced speed limits, Malleefowl signage). All sightings and interactions with the Malleefowl to be reported to the Environmental Department. Environmental personnel to identify and link with local wildlife carers/vets for injured Malleefowl. Staff training and awareness to provide information on the Malleefowl (e.g. how to identify adults, chicks and mounds, conservation status, the importance of minimising impacts on the species, adherence to speed limits, reporting to Environmental Department). 	LOW 1D	All phases
Minimise entrapment leading to injury or death of Malleefowl	MEDIUM 2B	<ul style="list-style-type: none"> Avoid accidental death and/or entrapment of fauna by installing egress points and/or fauna ladders in excavations and dams and/or regularly inspecting such facilities. Open holes, including drill holes, to be covered or capped during construction or rehabilitated when they are no longer required. Domestic waste facilities will be fenced and putrescible wastes will be regularly covered. Containers to have doors closed securely when not in use. 	LOW 1C	All phases
Minimise requirements for clearing which results in habitat loss and fragmentation	HIGH 4A	<ul style="list-style-type: none"> Avoid clearing of fauna habitat and minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas. Internal clearing permit procedure to be developed and implemented (to include flagging of clearing areas by surveyors, supervision of clearing by a suitably qualified environmental professional, reporting of over-clearing). Progressive land clearing with the amount of active disturbance minimised. Progressive rehabilitation in accordance with a Mine Closure Plan. Completion criteria will incorporate fauna and habitat restoration objectives. Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock. Where possible, direct placement of topsoil and vegetation will be respread over rehabilitated areas. The site layout will be compact, reducing fragmentation, and allowing fauna to move through the landscape on all sides of the project. 	MEDIUM 2C	Planning Construction Operation
Minimise pollution from light and noise	MEDIUM 1A	<ul style="list-style-type: none"> Project travel between dusk and dawn will be limited to essential travel. Lights will be strategically placed and designed to shine towards plant operations and minimise light spill to the surrounding environment. Equipment design will specify compliance with Australian Standard noise limits. 	LOW 1C	All phases

Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/Phase
Minimise increases to feral predator abundance (cat, dog, fox) and herbivorous competitors	HIGH 3B	<ul style="list-style-type: none"> Avoid attraction of both feral and native species to the project footprint by implementing domestic waste management procedures (e.g. fencing of landfills, regularly covering putrescible waste, secure lids on bins, borrow pits designed to avoid ponding water). Kidman will undertake pest animal control on site in cooperation with regional control programs where appropriate. Kidman will undertake monitoring of feral predator abundance to determine control program effectiveness. Kidman will consider contributing to the Western Shield program as a sponsor, as an offset or to provide predator control services. Staff training and awareness to include information on feral species (e.g. impact on the Malleefowl, no feeding of feral species and all sightings of feral species to be reported). 	LOW 1D	All phases
No increase in fire frequency or intensity	MEDIUM 2B	<ul style="list-style-type: none"> Avoid increases in fire frequency through maintenance of fire breaks and implementation of fire management procedures (e.g. Hot Work Permit system, fire-fighting training, Emergency Response Plan). Firefighting equipment will be located on site, in machinery and vehicles. Lightning protection equipment will be installed as part of project design where necessary. Vehicles will not be permitted to leave access tracks or cleared areas. Kidman will work with DPaW and DFES to undertake prescribed burns. Kidman will contribute to fire management in the region. Staff training and awareness to include information on the prevention and management of fires. 	LOW 1D	All phases