



Construction Environmental Management Plan, Kew
(EPBC 2018/8296)

Jojeni Investments Pty Ltd c/o Jojeni Investment Trust No.1

DOCUMENT TRACKING

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Template 2.8.1

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Declaration of Accuracy

EPBC requirement	Project specific detail
EPBC Number	2018/8296
Project name	Residential Development Ocean Drive, Kew EPBC 2018 / 8296
Proponent and ABN	Proponent: The Trustee for Jojeni Investment Trust No. 1 ABN: 56 704 220 260
Approved Action	To construct a residential development of approximately 417 lots and associated infrastructure on Lot 33 DP754405 and Lot 12 DP1091444 in Kew, NSW [See EPBC Act referral 2018/8296].
Location of the action	Lot 33 DP754405 and Lot 12 DP1091444 in Kew, NSW
Date of preparation	20 October 2021

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.



Alexandra Gorey

Senior Ecologist, Eco Logical Australia Pty Ltd

20 October 2021

1. Introduction

This Construction Environmental Management Plan (CEMP) has been prepared by Eco Logical Australia Pty Ltd (ELA) on behalf of Jojeni Investment Trust No 1 for the proposed residential subdivision at 168B & 201 Ocean Drive, Kew (Lot 12 DP1091444 and Lot 33 DP754405). The following CEMP includes specific risk assessments and controls for the Koala and for general environmental risks. This plan is to be read in conjunction with the Sediment and Erosion Control Plan (Hopkins Consultants 2018).

1.1 Outline of the CEMP

This CEMP sets out:

- construction and vegetation management areas
- a description of potential environmental impacts and risks specific to the Koala and general environmental risks
- environmental management measures for each potential risk
- environmental monitoring and corrective actions
- environmental management roles and responsibilities
- environmental incident and emergency procedures
- internal and external reporting arrangements
- requirements for audit and review of the CEMP.

1.2 Background

The subject site encompasses 168B and 201 Ocean Drive Kew (Lot 12 DP1091444 and Lot 33 DP754405) in the suburb of Kew in NSW (Figure 1). The lots are to be subdivided, creating approximately 417 lots and associated infrastructure. About 28.47 ha of land will be cleared on the subject site to allow for the development.

The Kew 'subject site' (Figure 1) consists of the proposed development footprint and the Vegetation Management Plan (VMP) area.

1.3 EPBC Act approval

The proposed action was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) for potentially significant impacts to *Phascolarctos cinereus* (Koala) and was determined to be a Controlled Action under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). Condition 3 of the conditions for approval state that a Construction Environmental Management Plan must be prepared and submitted to the Department for approval prior to the commencement of the action. Conditions 3 and 4 of the approval outline the requirements for Koala protection to be included in this CEMP (EPBC 2018/8296).

1.4 Purpose of this document

The purpose of this CEMP is to manage the potential direct and indirect impacts to *Phascolarctos cinereus* (Koala) during the 'clearing' (as defined in part C of the approval) as required under Conditions

3 and 4 of the EPBC Act approval (EPBC 2018/8296). This CEMP will need to be submitted to DAWE for approval prior to the commencement of the works.

Table 1 provides a summary of the Conditions of Approval and how they have been addressed in this CEMP.

Table 1: CEMP requirements under Conditions 1 – 4 of the EPBC 2018/8296

Condition no.	Consent Condition requirements	Section
1	The approval holder must not clear more than 28.47 hectares (ha) of Koala habitat within the Development Footprint. The approval holder must not clear outside the Development Footprint.	Section 2.4.1.1
2	No Koalas are to be killed or injured as a direct result of clearing within the development footprint as shown at Attachment A	Section 2.4
	Prior to clearing, the approval holder must submit to the Minister for approval a Construction Environmental Management Plan (CEMP). The CEMP is to address clearing for the action and must include specific measures for the protection of Koalas including, but not be limited to: <ol style="list-style-type: none"> i. A targeted pre-clearance survey undertaken by a suitably qualified person/s to inform the likely presence of Koalas during clearing. ii. A site assessment to be undertaken on the day of clearing by a suitably qualified person/s to identify if any Koalas are present in the trees to be removed. iii. If Koalas are observed within the area to be cleared, a 50 metre buffer must be maintained around the tree where Koalas are present, and an uncleared corridor must be left for Koalas to leave towards habitat outside of the area to be cleared. iv. Measures which are consistent with best practice, that will be undertaken if, following implementation of condition 3(iii), Koalas have not left the area to be cleared within three days. 	Section 2.4.1.3
4	To minimise the threats to Koala as a result of the development, the approval holder must ensure: <ol style="list-style-type: none"> i. Koala road crossings are installed at the indicative locations shown. ii. The installation of fencing in the areas indicatively shown. Fencing should be consistent with Port Macquarie – Hastings: Planning to protect koala habitat. Draft LEP, DCP and guideline (Version 1: Draft, March 2018). 	Section 2.4.3.1

1.5 Site description

The subject site (Figure 1) covers a total area of approximately 46 hectares (ha). The subject site is comprised of agricultural/grazing land, native vegetation and small scale rural residential development. The subject site is located north of Ocean Drive, approximately 2 km east of Kew and 1.3 km east of the Pacific Highway in the Port Macquarie Hastings Local Government Area (LGA).

1.5.1 Development footprint

The Development Footprint (Figure 1) consists of residential development with approximately 417 lots. It also includes the development of:

- a street network of roads, access ways and parking
- services, including water, sewer and electricity infrastructure

- detention basins to capture and treat run-off captured by road curbs and gutters
- bushfire asset protection zones and emergency vehicle egress.

1.5.2 Construction timeframe and duration

The construction phase is expected to commence in late 2021 and the development will take 10 years to complete.

1.5.3 Construction work hours

All work on site will only occur between the following hours (**pending Council confirmation**):

Monday to Friday	7.00am to 6.00pm
Saturday	7.00am to 5.00pm
Sundays or Public Holidays	No work

1.5.4 Onsite VMP area

The onsite offset area will be secured by the zoning of the koala habitat as E2 – Environmental Conservation and will be managed in accordance with a Vegetation Management Plan (VMP). Requirements for the ongoing management of this conservation area are presented in the *Kew, Ocean Drive Vegetation Management Plan*, prepared by Eco Logical Australia in 2021 for Jojeni Investments Pty Ltd c/o Jojeni Investment Trust No. 1.

The onsite offset area consists of 18.33 ha of native vegetation, of which 11.63 ha is koala habitat. The remaining 6.7 ha will be managed as a buffer to the development. Through ongoing management, the proposed VMP will ensure that the offset areas are improved over time, thus increasing the carrying capacity of the patch of koala habitat and increasing connectivity throughout the landscape over the coming years.

1.6 Roles and responsibility

Safeguards to manage potential environmental impacts are detailed in this report together with who is responsible for their implementation and at what stage of works. Roles and responsibilities are outlined in Table 2.

Table 2: Roles and responsibility

Role	Name/ Position/ Company	Responsibility
Project Manager (Development)	Project manager, TBA	<ul style="list-style-type: none"> reviews CEMP notifies relevant contractors of changes to the project scope and updates to CEMP, if required requires the contractor to adhere to the planning approval accountable for contractor’s and subcontractor’s environmental performance reports any non-compliance to Department of Agriculture, Water and Environment and Council.
Site Supervisor (Contractor)	TBA	<ul style="list-style-type: none"> issues stop work orders, if required records any community complaints (Appendix F) and notifies Project Manager (Development) and other relevant consultants. responsible for site management, CEMP and subcontractors facilitates environmental induction and tool box talks for site personnel undertakes minimum of weekly environmental inspections (or after environmental conditions change) ensures community are notified of commencement of works initiates corrective actions reports CEMP non-conformances to the Project Manager (development) reports incidents notifies the Project Manager (Development) if the CEMP needs revising issues stop work orders, if required.
Team members (Contractor)	TBA	<ul style="list-style-type: none"> complies with the CEMP monitors and maintains controls reports breaches of the CEMP and potential / actual incidents to Site Supervisor reports incidents stops work and reports to Site Supervisor in the event of unexpected finds (eg, potential contamination or heritage items) records any community complaints and notify the Site Supervisor (Appendix F).

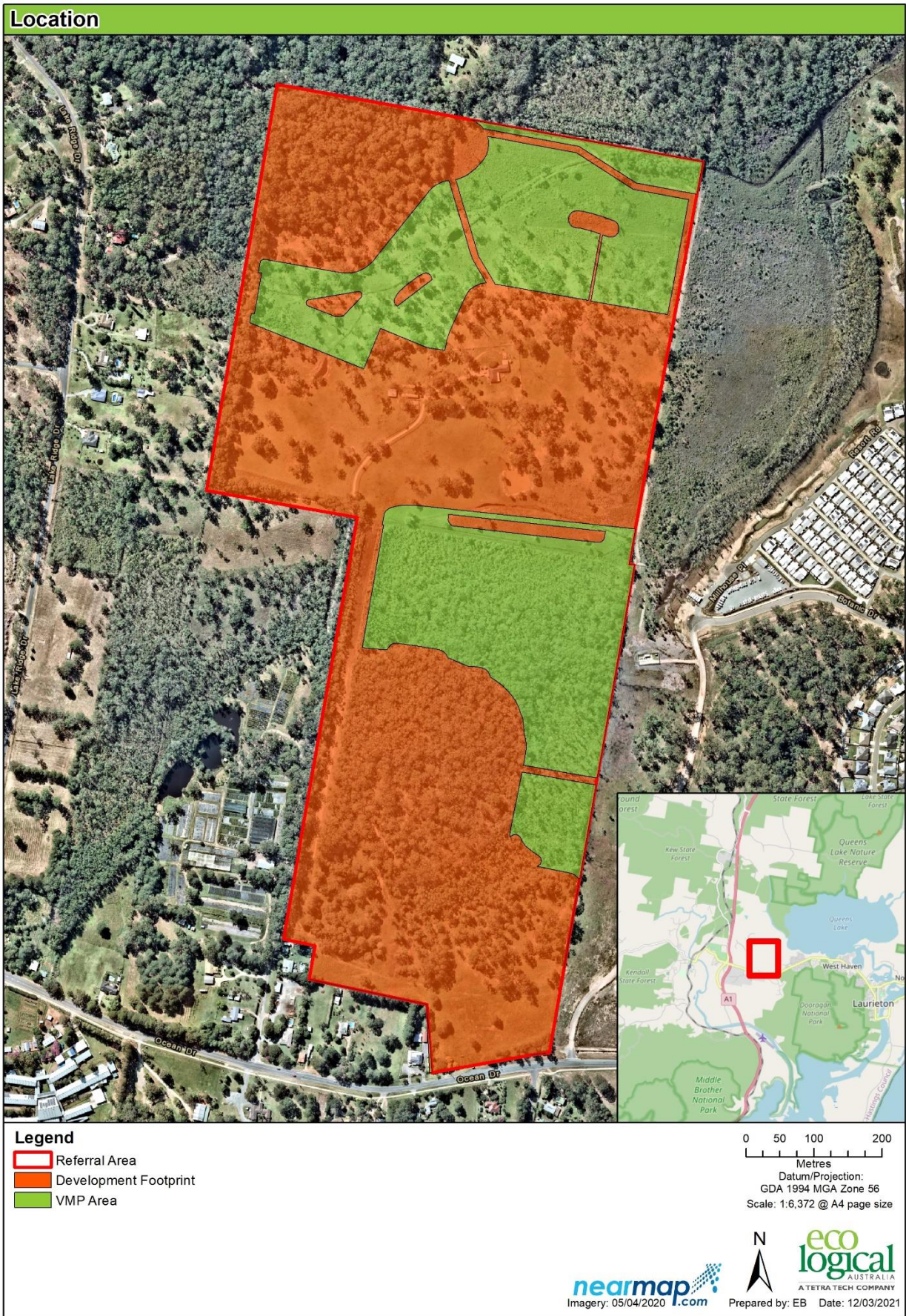


Figure 1: Site location

2. Koala management measures

2.1 Koalas in the Port-Macquarie Hastings Local Government Area

Koala populations stretch across the east coast of the continent. Koalas tend to prefer structurally diverse forest that includes a groundcover vegetation layer and habitat features such as hollow logs, showing long-term fidelity to home ranges. The most important factor influencing Koala occurrence is the food tree species available. With over 120 eucalypt species and 30 non-eucalypt species nationally, these can be divided into primary, secondary and supplementary food tree species.

Population estimates for the Port Macquarie – Hastings LGA are around 2000 Koalas (Port Macquarie – Hastings Council 2019). The highest concentration of Koalas in the LGA is east of the Pacific Highway, with the closest record approximately 1 km to the south east of the site (DPIE 2020). Port Macquarie – Hastings Council has estimated that the LGA contains 80,000 ha of potential Koala habitat with 24% of this area known to support the local population (Port Macquarie – Hastings Council 2019; Figure 2).

Within the Port Macquarie-Hastings population there is a nationally significant ‘source’ population (source population refers to a population of Koala that is key for breeding and dispersal). The estimated population size is ≥ 500 individuals located on public and freehold land surrounding Lake Innes (Port Macquarie – Hastings Council 2019). Secondary geographically discrete populations occur around Telegraph Point-Red Hill, Bonny Hills and Camden Haven, Dunbogan and around Yarras-Debenham in the western reaches of the Hastings Valley (Port Macquarie – Hastings Council 2019). Council considers these to each comprise a genetically unique population, and as such they could be classified as sub-populations.

2.2 Koalas in the study area

The vegetation communities within the study area contain the primary food tree species *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus microcorys* (Tallowwood), and the secondary food tree species *Eucalyptus resinifera* (Red Mahogany). Biodiversity Australia mapped the study area as potential Koala habitat. Extensive survey for the Koala has been completed across the study area from 2005 – 2017, including:

- ERM 2005 – Koala habitat assessment, call playback for nocturnal mammals, spotlighting and fauna scat searches.
- ELA 2007 & 2009 – potential Koala habitat assessment and diurnal traverses for fauna sightings.
- Biodiversity Australia 2017 – Koala scat searches, Koala call playback, Koala food trees mapping and follow-up scat searches.

During survey, no Koalas were observed or heard within the site. One potential scat was identified during survey (Biodiversity Australia 2017), however the scat was not verified as a Koala scat by a recognised expert. Historically, the Koala has not been recorded in the study area, with the closest record 1 km to the east (BioNet 2020). There is also a large cluster in Port Macquarie (DPIE 2020; Figure 2). Given that the species was not identified in the site during targeted survey and there are no previous records within the site, the site is unlikely to provide permanent foraging or breeding habitat for the Koala and the potential risk to the Koala as a result of the proposed development is expected to be low.

The measures outlined in this CEMP are precautionary and are designed to minimise the chance of harm in the unlikely event that a Koala is identified in the study area.

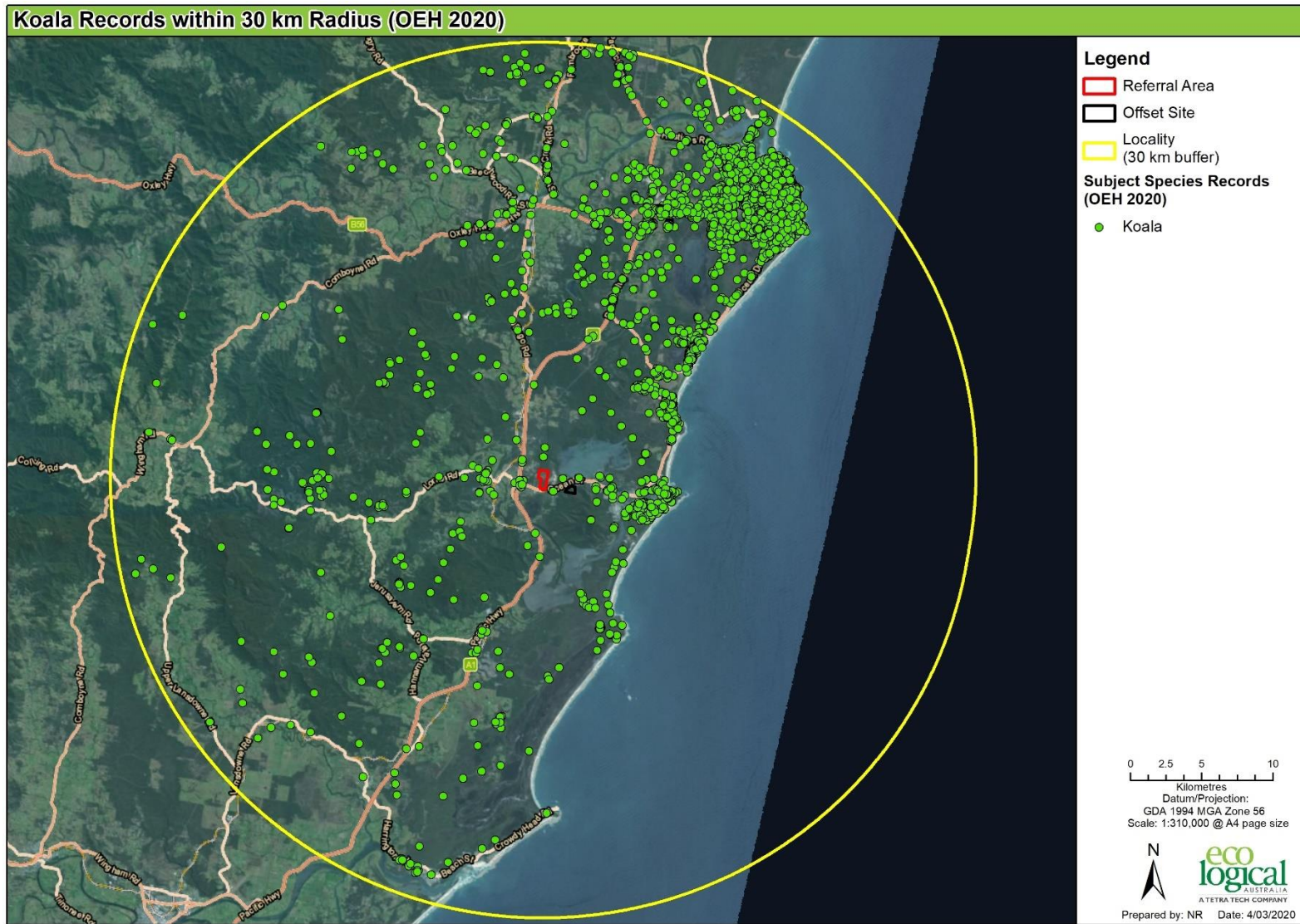


Figure 2: Koala records within a 30 km radius of the referral area

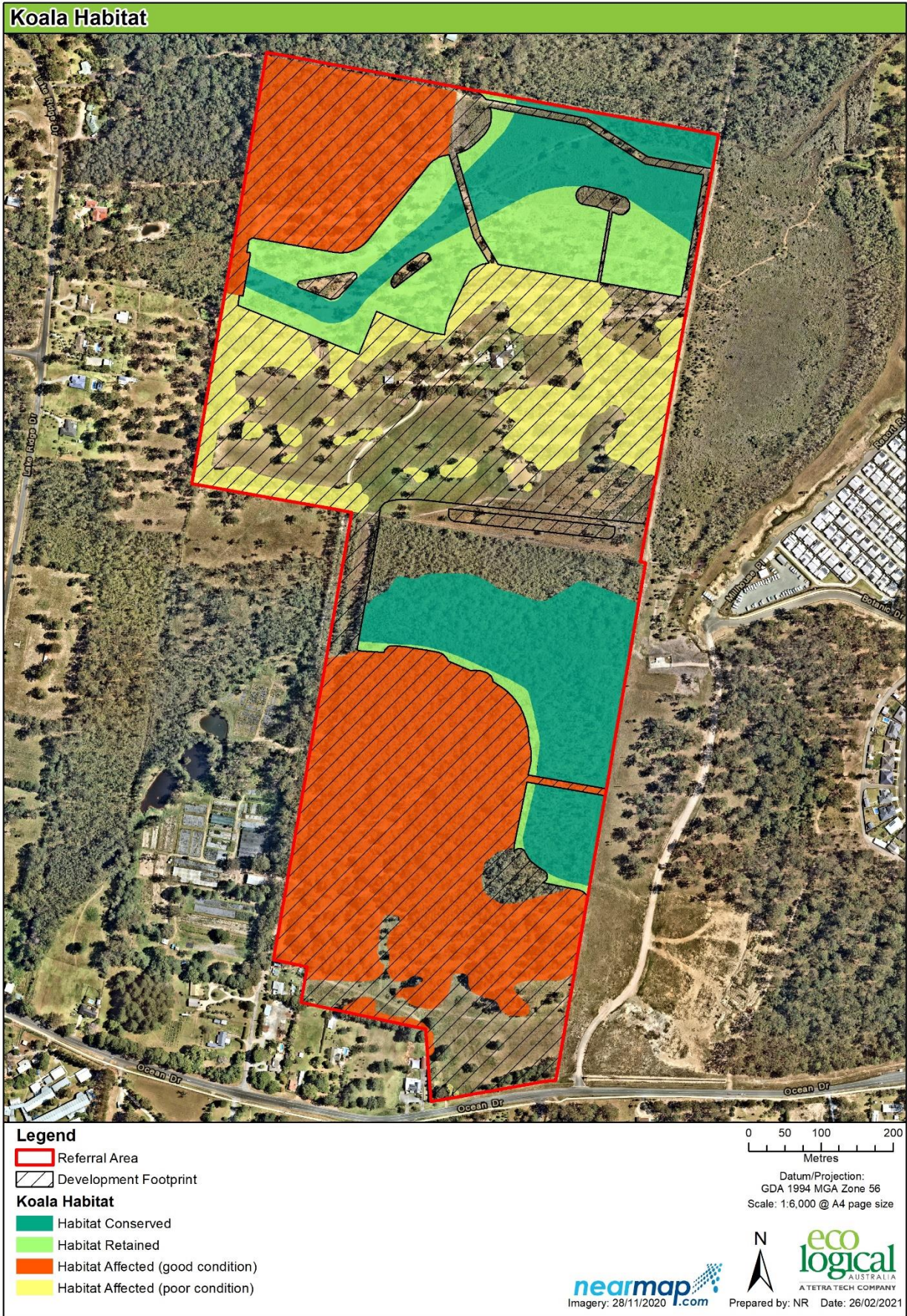


Figure 3: Koala habitat within the referral area

2.3 Potential threats to Koalas

The NSW Office of Environment and Heritage (OEH, 2018), the Department of the Environment, Water, Heritage and the Arts 2009 (DEWHA) and the Commonwealth Department of the Environment and Energy (DotEE, 2012 & 2018) identified types of threats to Koala. These include:

- Loss, modification and fragmentation of habitat
- Predation by dogs
- Traffic injury/death
- Pathogens and disease.

The potential increase in risk of threat to the Koala is considered low, given the absence of historical records and absence of the species across numerous surveys in the study area. Control measures which form part of this CEMP are precautionary and in the unlikely event that a Koala is present, they would minimise the risk of these threats to the Koala.

The risk of habitat fragmentation and modification is low, given that the proposed action is actively maintaining and managing existing corridors that extend beyond the study area. Dogs must be kept on leads in any VMP areas, speed limits will be implemented and signage installed to notify motorists that Koalas could be in the area.

2.4 Koala management actions

Koala management actions are detailed below and include actions for the design, construction and operational phases of the proposed development where relevant.

2.4.1 Pre-construction phase

2.4.1.1 Design and fencing

Design measures to avoid and/or reduce impacts to biodiversity values, including the Koala are:

- permanent protection of 18.33 ha of Koala habitat with the VMP
- maintenance and establishment of intact corridors through the subject site and connecting to other vegetated areas outside of the subject site
- design of subdivision layout, including perimeter roads, water quality basins and Asset Protection Zones to reduce impacts to and protect VMP areas.
- temporary protective fencing will be erected around the areas identified in Figure 5 consistent with the provisions outlined in the VMP (ELA 2021).

2.4.1.2 Pre-clearance surveys

Pre-clearing surveys will be undertaken in the development footprint by a suitably qualified ecologist no more than five days prior to the commencement of clearing. The ecologist will use spray paint and/or flagging tape to clearly mark and record the location of habitat features (hollows, crevices, decorticated bark, nests) using a GPS. The previous mapping undertaken by Biodiversity Australia (2018) will be used as a base map for the pre-clearing surveys and updated where required (Figure 4). Features to be recorded within the development footprint include:

- all potential Koala feed trees (those considered to be primary or secondary food tree species and with a DBH over 30 cm)

- any Koalas present
- hollow bearing trees (HBTs)
- any other key habitat feature fauna may use for refuge e.g. log piles / windrows, fallen trees with hollows, rocky outcrops, arboreal termitaria, dens, large and dense Lantana thickets, etc.
- any bird nest or possum drey.

2.4.1.3 Contractor inductions

All project personnel and contractors will undergo environmental induction training before commencing work on site. Information to be addressed during this training will include:

- areas of Koala habitat across the study area (including the development footprint)
- areas subject to the VMP which are no-go areas
- how to identify / recognise a Koala
- procedures to be followed if Koalas are found injured in the proximity of works areas
- the site supervisor will be inducted into how to complete the daily site inspections for the Koala, and the procedure to follow should a Koala be identified
- stop works procedure if a Koala is found during construction or any onsite works.

2.4.2 Construction phase

2.4.2.1 Koala feed tree removal

Prior to the commencement of clearing each day, a suitably qualified ecologist or inducted sit supervisor will complete an assessment of the area to be cleared to detect the presence of Koala. Clearing can commence once the inspection is complete. If any Koalas are present, the following will be demarcated:

- The tree containing the Koala
- and a 50 m radius around the tree
- a vegetated buffer connected the tree to areas of Koala habitat outside of the clearing footprint.

If any Koalas are identified, works must cease until the Koala has moved on from the clearing area of its own accord. If Koalas remain within the area to be cleared after three days, measures which are consistent with best practice will be undertaken to ensure no harm to the Koala. This would be discussed with the project ecologist and would depend on whether any Koalas present are carrying young, and would generally involve:

- works to cease until the individuals have moved on
- potential relocation of earthworks to an area unlikely to pose a threat to individuals present
- consultation with WIRES and other wildlife groups about relocating the individuals.

If The daily site inspection is completed by the ducted site supervisor and a Koala is identified, , the ecologist must be contacted and works will temporarily cease.

To ensure that an uncleared corridor is available for any Koalas identified in the site during construction, it is recommended that works commence furthest away from the VMP area, such that a connection is always maintained between the development footprint and retained Koala habitat.

2.4.2.2 Hollow-bearing tree and habitat removal

An ecologist must be present during clearing of HBTs and key habitat features to minimise the risk of harm to native animals. HBTs could contain fauna at the time of clearing. Such fauna may be placed under stress, injured or killed during tree felling via:

- Being nocturnal or in torpor, and unable to escape prior to the tree falling.
- Collapse of the hollow when it impacts the ground
- Collision with internal walls or via being thrown out when the tree falls.
- Being present as young e.g. eggs or nestlings

Prior to the commencement of clearing, hollows within the development footprint will be inspected for any resident fauna. Where hollows are empty of any fauna or nesting materials in use, the hollow could be blocked to prevent use prior to felling. This must be assessed on a tree by tree basis. These trees will still require felling supervision by an ecologist.

Where fauna are present in hollows, the hollow bearing limbs or spouts will be sectionally lopped and lowered by a suitably qualified tree climbing arborist. The sectional lop and lower method allows the hollow limb to be safely lowered to the ground and inspected by a suitably qualified ecologist. Hollows are to be immediately inspected by the ecologist once the tree / limb is felled or lowered (within WQH&S guidelines) for injured individuals or abandoned offspring, and appropriate measures undertaken. If the hollow has collapsed and fauna may be buried, the material must be thoroughly searched.

If hollows cannot be confidently determined not to contain fauna, the fallen tree must either be allowed to sit overnight in a safe area where it will not be subject to disturbance for the rest of the day; or may be sectioned by chainsaw to clear hollows of fauna. The ecologist is to work closely with the chainsaw operator and climber to minimise the risk of fauna being injured during sectioning, such as via:

- using a torch or endoscope to identify a point where the hollow can be cut without risk of injuring fauna
- blocking any holes with a rag before commencing cutting to minimise risk of fauna attempting to escape during chainsawing.

All captured nocturnal animals will be placed within a suitable bag and / or directly into a suitable container (e.g. Elliot trap with nesting material, pet carrier, customised plastic box with ventilation, etc.), and stored until dusk in a cool, quiet area out of direct sun or at risk of ant infestation. Unharmful animals will then be 'soft-released' at dusk in nearby habitat via opening the container and allowing the animal to leave on its own volition. Diurnal fauna are to be relocated and released immediately after capture into the VMP area to minimise stress and allow the animal to find shelter. Any injured or fauna incapable of independent survival are to be taken into care by wildlife rescue. Rehabilitated animals are to be released in the retained habitat directly on / or adjacent to the site, preferably as close to the animal's remaining home range, unless otherwise specified as legally applicable.

The ecologist will capture any resident animals injured or not evacuating, and undertake appropriate emergency actions if required e.g. transport animal to veterinary treatment (care at proponent's cost) or care by wildlife rescue (WIRES, RSCPA etc). Best practice is to notify the wildlife rescue prior to the commencement of works.

Animals which are severely injured are to be immediately taken to an approved vet (all clearing of habitat features must stop) for treatment including euthanasia where relevant.

2.4.2.3 Nest removal

Terrestrial habitat features should be disturbed by the ecologist to encourage any resident fauna to relocate before clearing commences (breaking up hollow logs and overturning debris). Any fauna detected during this process is to be captured if possible and relocated off-site to adjacent habitat. If a bird nest is found to be active (i.e. with nestlings), clearing will ideally not be programmed until the young have fledged.

Nests detected before tree is felled

The species of bird will be identified and depending on the species' conservation status, the nest may need to remain untouched until the chicks have fledged. If this situation arises, OEH is to be contacted for advice. The nest will be visually inspected from the ground to observe any eggs or nestlings. If the nest is not visible from the ground, a cherry picker, drone or tree climber can be used to view the nest. If a nest is active (contains nestlings or eggs) and is not a threatened species, the following will apply if works cannot be delayed.

Nests detected after tree is felled

If a nest is found containing eggs or nestlings, wildlife rescue will be immediately contacted to collect them. Eggs or nestlings will be placed in appropriate bags (calico bags for eggs, and bags with towels for nestlings) to be kept as warm as possible until wildlife rescue collects them.

2.4.2.4 Removal of other key refuge habitats

These include:

- hollow logs
- large log piles
- materials such as abandoned vehicles, construction debris (excluding asbestos contaminated materials), roofing sheets, etc.
- bushrock / boulders / rocky outcrops.

These features will be marked during pre-clearing surveys or checks. These features will be cleared under the supervision of a suitably qualified ecologist.

2.4.3 Post-construction phase

Fences will be maintained until construction has been completed. Bridge crossings will be maintained by the proponent until the land is handed over to Council. Council will be responsible for the ongoing maintenance of the bridge crossings. Following the completion of construction, a report is prepared by a suitably qualified ecologist to demonstrate that all fences, bridge crossings and signage has been installed correctly and is functioning.

2.4.3.1 Koala bridges and crossing

Koala bridge crossings will be constructed in the areas indicatively identified in Figure 5 consistent with the provisions outlined in the VMP (ELA 2021).

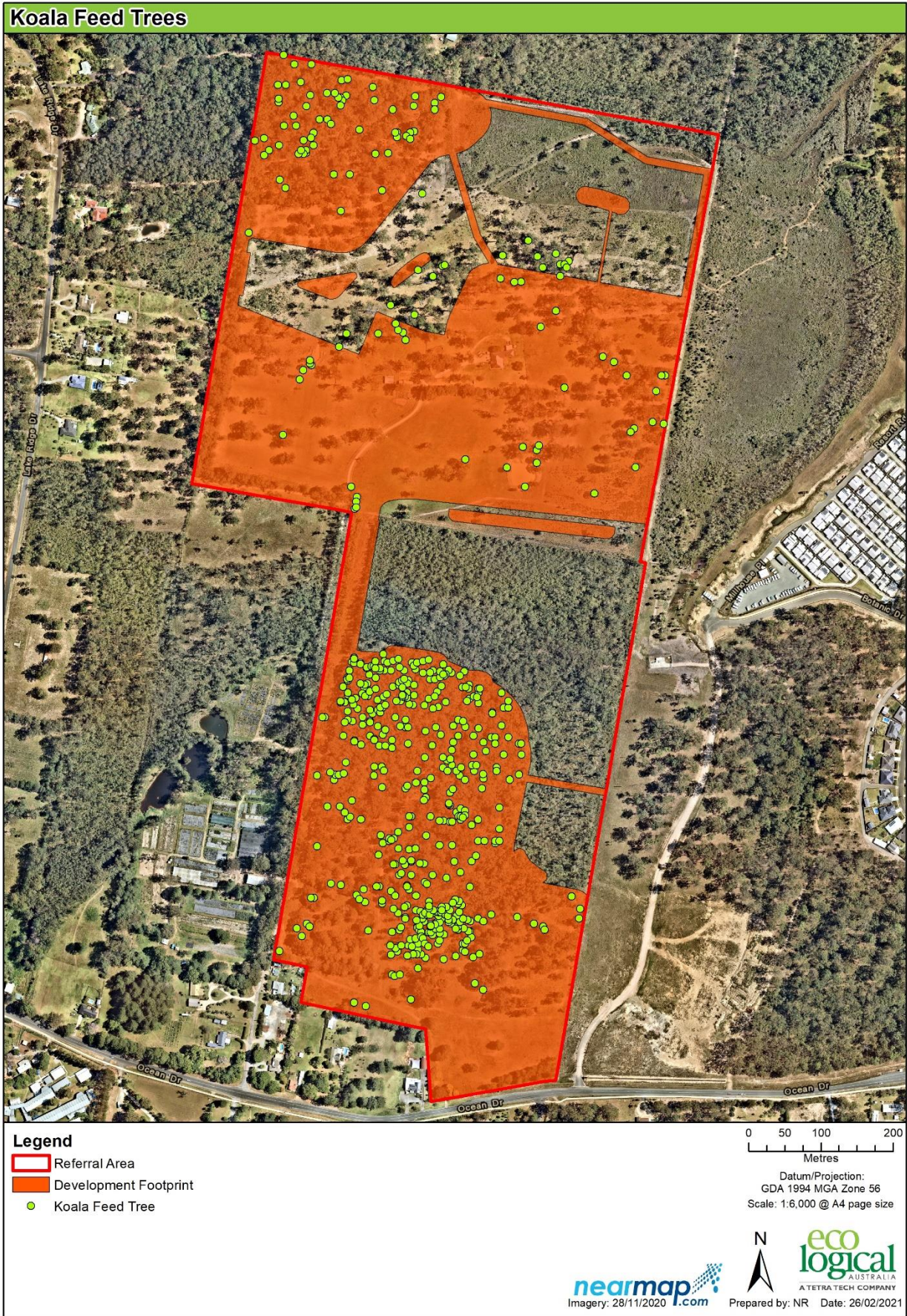


Figure 4: Koala feed trees in the development footprint (Biodiversity Australia)

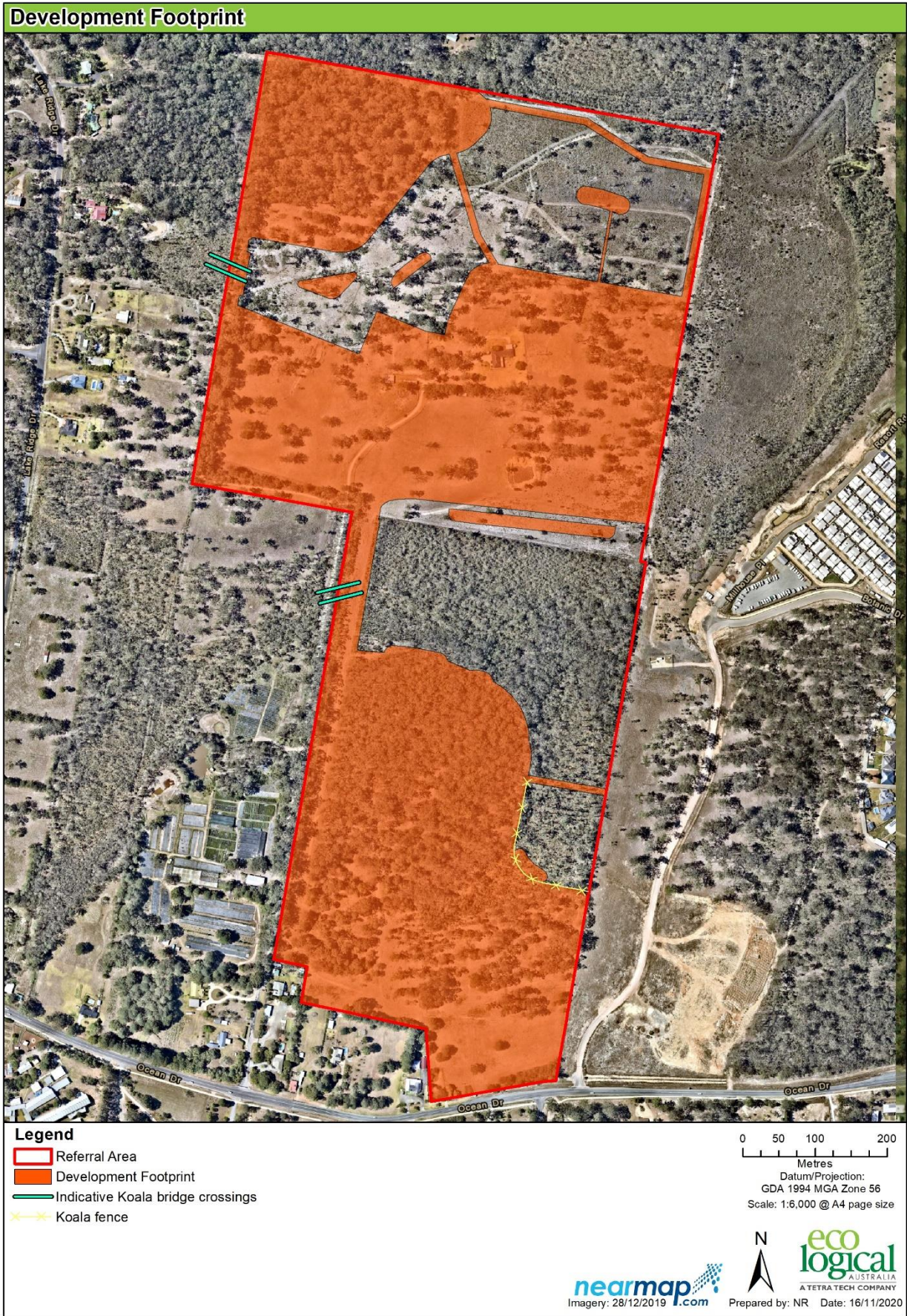


Figure 5: Location of Koala bridge crossings and Koala fencing in the study area

3. Environmental risks and controls

3.1 Potential environmental risks

The proposed action has the potential to pose the following environmental risks:

- pollution of waterways and / or riparian corridors during bulk earthworks and construction
- movement of dust throughout the study area and the locality during bulk earthworks
- noise pollution as a result of heavy machinery during bulk earthworks and construction
- rubbish dumping
- spreading of weeds and pathogens to retained vegetation throughout the study area

A qualitative risk assessment methodology has been applied to the environmental risks in accordance with *Environmental Management Plan Guidelines, Department of the Environment Commonwealth of Australia 2014*.

Each environmental risk identified in Section 2 and 3 has been rated in terms of likelihood of occurring and the consequence to the Protected Matter if it did occur using the criteria in Table 2 and Table 3. These ratings were then combined to generate a risk rating of low, medium, high or severe (Table 4).

Table 5 then lists the risk assessment for each of the potential environmental impacts before and after mitigation; describes the mitigation measures proposed to minimise each risk and assesses the residual risk levels after implementation of mitigation measures. Table 5 also identifies the risks to achieving the environmental objectives of the CEMP in terms of the scientific, ecological or budgetary uncertainties that may prevent the desired outcome from being achieved, how the desired outcome is being monitored/detected by trigger values and likely adaptive management measures if the desired outcome is not met.

Table 3: Definition of likelihood of occurrence

Likelihood	Definition
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances

Table 4: Definition of consequence

Consequence	Definition
Minor	Minor incident of environment damage that can reversed
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts.
High	Substantial instances of environmental damage that could be reversed with intensive efforts
Major	Major loss of environmental amenity and real danger of continuing
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage

Table 5: Risk framework

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

3.2 Managing uncertainty and adaptive implementation

Table 6 identifies the risks to achieving the environmental objectives of the CEMP in terms of the scientific, ecological or budgetary uncertainties that may prevent the desired outcome from being achieved, how the desired outcome is being monitored/detected by trigger values and likely adaptive management measures if the desired outcome is not met.

The main area of uncertainty in achieving the objectives of the CEMP are:

- Insufficient funds provided by the approval holder to implement the management actions identified
- Inadequate induction/training of project staff leading to miscommunications of the actions to be implemented and/or matters to be protected
- Poor implementation of identified mitigation measures.

The risk of these uncertainties arising is reduced by the monitoring program proposed that will ensure that staff training and induction programs are implemented, records of these programs are retained, and daily, weekly, monthly monitoring and site audits against a checklist are undertaken to detect any incidents of non-compliance with appropriate corrective actions identified and implemented through an adaptive management program (Section 4).

3.3 Environmental objectives, performance targets and indicators

Table 6 provides the environmental objectives relevant to each risk, the performance targets for each objective, the commitments (management actions) made to achieve each objective, the responsible party for undertaking the management action, the performance indicators for each management action, and the timing and frequency of each action.

3.4 Environmental control measures

The environmental control measures for the proposed action are outlined in Table 6 and Table 8. Table 7 and Table 8 detail the requirements for implementation of the management measures to meet management objectives, performance targets and indicators, monitoring, the identification of responsibilities and timeframes for implementation of measures for the Koala and the environment respectively.

Table 6: Management actions to minimise environmental risks

Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
To ensure that construction works are completed in accordance with project approvals to minimise negative impacts to retained Protected Matters	No disturbance to or clearing of any vegetation / habitat beyond the approved project footprint as a result of construction activity	Ensure that all staff are inducted and aware of ecological sensitive areas (as indicated on Figure 1), including the location of on-site VMP areas and riparian zones and, for relevant staff, tree clearing protocol.	Weekly inspection of fencing and any unauthorised disturbance of VMP areas Incident reports	Staff training and induction undertaken & records retained Toolbox talks undertaken Pre-start meetings held Up to date Environmental Control Map Incident reports acted on Records of daily, weekly inspection of signage / fencing and issues rectified as necessary	Project manager	At all times
To prevent any inadvertent damage to retained vegetation	Protective fencing around VMP areas maintained at all times	Temporary protective fencing must be erected around the VMP areas prior to clearing activities commencing to minimise any inadvertent damage.	Weekly inspection of fencing and any unauthorised disturbance of VMP areas Incident reports	Staff training and induction undertaken & records retained Toolbox talks undertaken Pre-start meetings held Up to date Environmental Control Map Incident reports acted on Records of daily, weekly inspection of signage / fencing and issues rectified as necessary	Construction Manager Project Ecologist	Pre-construction

Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
To prevent injury /death of threatened fauna during clearing	No death or injury of Koalas or other threatened fauna species during vegetation clearing as a result of construction activity	The Tree Clearing Protocol (Section 2.4) is to be implemented for any tree clearing. Hollow-bearing trees within open space areas that potentially contain roosting and breeding habitat for threatened microbats must be identified by a suitably qualified ecologist	Pre clearing report Incident reports	Project ecologist present during all clearing works Daily tree clearing reports Incident reports acted on Trees to be retained identified on updated Environmental Control Map	Project Ecologist Project Manager All staff	Pre-clearing and Pre-construction
To increase habitat values in VMP areas	Fauna habitat features retained on-site or salvaged for reuse in VMP areas	Any trees, or parts thereof, that would be appropriate for use as fauna habitat, is to be identified by a suitably experienced ecologist and salvaged for re-use within the on-site VMP areas.	Pre-clearing reports	Woody material salvaged and relocated to VMP areas in accordance with VMP VMP monitoring and annual reports	Project ecologist / Project Manager / Construction Manager	During tree clearing
To prevent the introduction and spread of invasive weeds to VMP areas	No weeds dispersed or introduced to VMP areas as a result of construction activity	Prior to entering and leaving the site, all vehicles and equipment involved in clearing and weed removal works will be cleaned to remove soil and plant material (Refer to Hygiene Protocol Appendix B) During vegetation clearing and weed removal, weed species are to be stockpiled separately and disposed of at an appropriate waste disposal facility.	Daily checks of vehicles Weekly inspection records Incident reports VMP monitoring and annual reports that assess weed cover	Pre-start checklists completed Daily checks of vehicles undertaken as determined by retained records Incident reports acted on VMP monitoring and annual reports completed	All Staff	At all times

Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
To prevent the introduction of soil pathogens to VMP areas	No soil pathogens introduced to VMP areas as a result of construction activity	Prior to entering and leaving the site, all vehicles and equipment involved in construction, clearing and weed removal works must be cleaned to remove soil and plant material (Refer to Hygiene Protocol – Appendix B). Implementation of Erosion and Sediment Control Plan (ESCP – Appendix C).	Daily checks of vehicles Weekly inspection records Incident reports VMP monitoring and annual reports that assess weed cover	Pre-start checklists completed Daily checks of vehicles undertaken as determined by retained records Incident reports acted on VMP monitoring and annual reports completed	All Staff	At all times

<p>To prevent erosion and sedimentation impacting VMP area and waterways</p>	<p>No erosion or sedimentation as a result of construction activity impacting VMP areas. Any erosion in VMP areas as a result of construction activity has an appropriate management plan at completion of construction activity</p>	<p>Erosion and sediment control methods listed in the ESCP (Appendix C and Appendix D) will be installed prior to construction commencing and will include:-</p> <ul style="list-style-type: none"> • Minimise areas of bare soil wherever possible through phasing of works and covering/ stabilising. • Create stabilised site access and egress with vehicle cleaning bay / rattle grids to reduce the likelihood of vehicles tracking soil materials onto public roads. • Install catch drains or staked straw bales upslope of the area to divert rain and surface waters from outside the site away from the site • Install sediment controls downslope at the site to capture sediments from the works from going offsite • Soil stockpiles and concrete washout are to be located away from waterways and drainage lines • Soil stockpiles are to be covered/ stabilised and to be protected from sediment runoff by a catch drain constructed along uphill sides and a suitable silt fence/sediment trap constructed on the downhill sides. 	<p>Monitoring and maintenance of all erosion and Sediment controls to be undertaken daily Concrete washout bay and waste storage areas are to be monitored regularly and washout and waste to be disposed of to an appropriately licenced waste facility</p>	<p>Daily inspection records Weekly inspections Erosion and sediment control fences Post rainfall site inspection records</p>	<p>All staff</p>	<p>At all times</p>
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Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
		<ul style="list-style-type: none"> Rock wrapped in geofabric or straw bales to be installed in or around any stormwater drainage inlet Monitor and maintenance of all erosion and sediment controls to be undertaken daily. Concrete is to be washed-out in designated concrete wash-out area lined with suitable material and bunded to avoid release of washout materials. <p>Roads surrounding each part of the on-sites VMP areas are to be fully curbed and guttered with piped stormwater management infrastructure. Detention basins in the E3 zoned land would also manage stormwater.</p>				
To prevent high levels of dust that may inhibit growth/health of vegetation	No deposits of dust affecting plant health in VMP areas as a result of construction activity	<p>Implementation of Dust Management Control Plan (DMCP) (Appendix E)</p> <p>Dust control methods listed in the DMCP include:-</p> <ul style="list-style-type: none"> Stabilised site access and egress routes Minimise areas of bare soil (including stockpiles) wherever possible through phasing of works and covering/ stabilising with suitable materials. 	<p>Water cart usage records</p> <p>Covering of haul vehicles</p> <p>Monitoring of stockpiles</p> <p>Incident reports</p> <p>VMP site monitoring and annual reports that assess vegetation health and condition</p>	<p>Staff training and induction records</p> <p>Toolbox talks records</p> <p>Pre-start meetings</p> <p>Weekly inspection records</p> <p>Incident reports</p>	Construction Manager / All Staff	At all times

Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
To prevent the spread of litter and waste to VMP areas and waterways	<p>No litter or waste in VMP areas as a result of construction activity</p> <p>VMP areas are free of rubbish and waste at completion of construction</p>	<p>The work site will be maintained free of rubbish and monitored daily to ensure compliance.</p> <p>Disposal containers are to be located away from riparian zones and regularly emptied</p>	<p>Daily and weekly inspection of bins</p> <p>Incident reports</p> <p>Monthly audits</p>	<p>Daily and weekly inspections undertaken</p> <p>Bins and waste storage units not exceeding 100% capacity</p> <p>Incident reports acted on</p> <p>Monthly audits completed</p> <p>VMP site monitoring and annual reports</p>	Construction Manager / All Staff	At all times
To prevent the risk of spills of hazardous materials across development site and into VMP areas and waterways	<p>No oil, fuel or chemical spills affecting VMP areas as a result of construction activity</p> <p>No pollution (including sedimentation) of water bodies and riparian areas as a result of construction activity</p>	<p>Staff will be trained in incident response plan, including spills management</p> <p>All hazardous material, including hydrocarbons (fuels) will be securely stored in a designated storage area away from water bodies and riparian zones.</p> <p>Spill kits shall be provided, including in designated vehicles and all operators trained in their use.</p> <p>Vehicles and plant will be refuelled and serviced off site wherever practical</p> <p>Location of hazardous materials, storage locations and spills equipment is to be included within the Environmental Control Map</p>	<p>Visual monitoring will be undertaken during the works to detect any fuel or chemical spills.</p> <p>If any spills / turbidity plumes are observed, works will be stopped immediately;</p> <p>incident response plan implemented</p>	<p>Incident response Plan training undertaken by all staff</p> <p>Hall hazardous materials stored in designated location</p> <p>Location of hazardous materials and spills equipment included on the Environmental Control Map</p>	Construction Manager / All Staff	At all times

Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
To avoid potential indirect impacts to fauna from lighting directed into VMP areas	All street lighting complies with Australian Standard 4282 – Control of the obtrusive effects of outdoor lighting	<p>Work involving the use of machinery of any description will only be carried out from 7.00am to 6.00pm, Monday to Friday, 7.00am to 5.00pm Saturday, with no work to be carried out on Sundays or Public Holidays</p> <p>Lighting to comply with Australian Standard 4282 – Control of the obtrusive effects of outdoor lighting</p> <p>Position and direct lights away from the VMP area and outside site boundaries</p>	Checking of position and angle of street light installation	Lighting complies with Australian Standard 4282 – Control of the obtrusive effects of outdoor lighting	Construction Manager	At all times
To avoid potential indirect impacts to fauna from excessive construction noise	<p>All construction work carried out in accordance with approved time frames</p> <p>All plant and equipment maintained and operated as per manufacturer’s specifications</p>	<p>Work involving the use of machinery of any description will only be carried out from 7.00am to 6.00pm, Monday to Friday, 7.00am to 5.00pm Saturday, with no work to be carried out on Sundays or Public Holidays.</p> <p>All plant and equipment to be maintained and operated as per manufacturer’s specifications and to be inspected prior to work. Any faulty plant or equipment is to be stood down until repaired</p> <p>Limit idling/ revving of engines on mobile and stationary machines and shut down any equipment not in use.</p> <p>Limit the use of horns or other audible signals on mobile equipment to the maximum practical extent.</p> <p>Promptly respond to complaints and modify practices.</p>	<p>Pre-start checklists</p> <p>Maintenance log books</p> <p>Incident reports</p> <p>Random Checks</p>	<p>Pre-start checklists completed</p> <p>Maintenance log books maintained</p> <p>Incident reports acted on</p> <p>Random Checks undertaken</p>	Construction Manager / All Staff	At all times

<p>To avoid, reduce potential for road kill of Koala in referral area (Ocean Drive residential subdivision)</p>	<p>No road deaths or injuries in action area during construction</p>	<p>Construction Phase</p> <p>Implementation of Koala Management Protocols contained in this CEMP (Section 2) to reduce potential traffic injuries or death</p> <p>Construction traffic to utilise clearly defined access and egress points to and from the development site that avoid retained Koala habitat areas (Figure 3)</p> <p>Construction traffic within the development site to keep to designated routes where possible</p> <p>Parking and equipment and material laydown areas to be located away from VMP areas</p> <p>Construction traffic is to adhere to construction zone speed limits across the site</p> <p>Exclusion fencing will be installed prior to site works commencing to delineate the limit of areas impacted by the works and accessible by construction traffic</p> <p>Operational Phase</p> <p>Local roads will have speed limit restrictions agreed to by Council</p> <p>Perimeter roads and roads adjacent to Koala habitat areas will be signposted to alert road users to possible presence of Koalas</p> <p>'Koala Warning Signs' dispersed throughout the internal road network (Refer to Vegetation management plan)</p>	<p>Staff induction training to include recognition of Koala and other threatened fauna</p> <p>Daily inspection of work area for presence of Koala</p> <p>Daily / weekly inspection of VMP area fencing</p> <p>Pre-clearance survey</p>	<p>Appointment of project Ecologist</p> <p>Records of staff training/induction</p> <p>Fence inspection reports</p> <p>Records of observations of Koalas in action area during construction activities</p>	<p>Construction Manager / Project Ecologist / All Staff</p>	<p>At all times</p>
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Management objective / outcome	Performance target and / or completion criteria	Management action / measure	Monitoring activity	Performance indicators	Responsibility	Timing and frequency
To avoid, reduce potential for disturbance to Koala from domestic animals (dogs) in referral area (Ocean Drive residential subdivision)during construction	No dog attacks (dogs owned by construction staff) in action area during construction	<p>Construction Phase</p> <p>Implementation of Koala Management Controls contained in the CEMP</p> <p>Dogs to be kept on a leash in the VMP areas</p> <p>VMP areas will be fenced and have signage to prohibit dog-entry – (Refer to VMP (ELA 2021)</p> <p>Operational Phase</p> <p>In public open spaces, all dogs will be required to be kept under control by their owners, in accordance with Local Government and Companion Animal Act dog ownership regulations.</p> <p>Dogs will be prohibited from entry into the VMP areas (subject to Council approval). These areas will be actively managed and subject to enforcement powers under the Local Government Act</p> <p>All public areas will be effectively signposted regarding dog exercise provisions</p> <p>Education programs for residents regarding the requirements for dogs within the development</p>	<p>Construction Phase</p> <p>Daily inspections for presence of dogs</p> <p>Design of residential lot fencing complies with Design Guidelines</p> <p>Operational Phase</p> <p>Routine inspection of open space areas and off leash areas by Council enforcement officers</p> <p>Records of Community Education Programs</p>	<p>No dogs on site with project staff</p> <p>Rear yards of house lots are dog proof</p>	Construction Manager / Project Ecologist / All Staff	At all times

Table 7: Potential impacts and proposed mitigation measures for protected matters (Koalas) during construction

Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							
Loss of fauna habitat beyond approved development footprint	Possible	High	Major	To ensure that no clearing occurs beyond the approved footprint	None	Ensure that all staff are inducted and aware of ecological sensitivities, including the location of all VMP areas and riparian zones (Figure 2). Temporary fencing and permanent signage must be erected consistent with Figure 5. Fencing designs are detailed in the VMP (ELA 2021). Fencing will be constructed prior to the commencement of bulk earthworks. Signage will be installed prior to completion of construction. Any trees, or parts thereof, that would be appropriate for use as fauna habitat, are to be identified by a suitably experienced ecologist and salvaged for re-use within the VMP areas.		Low	Staff induction & training records Daily, weekly inspection of VMP site fencing Incident reports	Repair to fence of damaged vegetation/habitat
Injury/death of threatened fauna in	Likely	High	High	To avoid any direct death/injury to	Insufficient funds allocated to pre-clearance surveys	Hollow-bearing trees within the study area that potentially contain roosting		Low	Staff induction & training records	Increase level of inspection of hollows prior to clearing

Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							
vegetation clearing				wildlife, in particular Koala during clearing activities		and breeding habitat for fauna must be identified by a suitably qualified ecologist prior to clearing activities. The Tree Clearing Protocol is to be implemented for any habitat tree clearing. Any threatened species identified during the Project will be recorded in compliance and audit reports			Pre-clearance survey reports Incident reports	Ensure slow/soft-drop technique of tree clearing is being followed
Indirect impacts to fauna associated with construction lighting	Possible	Minor	Low	To avoid potential indirect impacts to fauna from lighting directed into VMP areas	None	Work involving the use of machinery of any description will only be carried out from 7.00am to 6.00pm, Monday to Friday, 7.00am to 5.00pm Saturday, with no work to be carried out on Sundays or Public Holidays as required by Council conditions of approval for DA 2017/3868. Lighting to comply with Australian Standard 4282 – Control of the obtrusive effects of outdoor lighting Position and direct lights away from the VMP area	Low	Checking of position and angle of lights installation of street lighting	Adjust angle of lights	

Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							
Indirect impacts to fauna associated with construction noise	Possible	Minor	Low	To avoid potential indirect impacts to fauna from excessive construction noise	None	Work involving the use of machinery of any description will only be carried out from 7.00am to 6.00pm, Monday to Friday, 7.00am to 5.00pm Saturday, with no work to be carried out on Sundays or Public Holidays as required by Council conditions of approval for DA 2017/3868. All plant and equipment to be maintained and operated as per manufacturer's specifications and to be inspected prior to work. Any faulty plant or equipment is to be stood down until repaired Limit idling/ revving of engines on mobile and stationary machines and shut down any equipment not in use. Limit the use of horns or other audible signals on mobile equipment to the maximum practical extent.	Low	Pre-start checklists Maintenance log books Incident reports Random Checks	Any faulty plant or equipment is to be stood down until repaired Promptly respond to complaints and modify practices	

Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							

Promptly respond to complaints and modify practices.

Direct impact from vehicle collisions on residential streets adjacent to the VMP areas	Possible	High	High	To avoid, reduce potential for road kill of Koala in referral area (Ocean Drive residential subdivision)	Insufficient funds allocated to implement/install mitigation measures	<p>Construction Phase</p> <p>Construction traffic to utilise clearly defined access and egress points to and from the development site that avoid retained Koala habitat areas (Figure 3)</p> <p>Construction traffic within the development site to keep to designated routes where possible</p> <p>Parking and equipment and material laydown areas to be located away from VMP areas</p> <p>Construction traffic is to adhere to construction zone speed limits across the site</p> <p>Exclusion fencing will be installed prior to site works commencing to delineate the limit of areas impacted by the works and accessible by construction traffic</p>	Low-medium	<p>Training & induction records</p> <p>Pre-clearance surveys</p> <p>Monitoring of fencing</p> <p>Observations of Koalas in action area during construction activities</p>	<p>Cessation of construction activities if Koala are present in immediate work area as directed by Project Ecologist</p>
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Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							
							<p>Operational Phase</p> <p>Local roads will have speed limit restrictions of 50km/h</p> <p>Perimeter roads and roads adjacent to Koala habitat areas will be signposted to alert road users to possible presence of Koalas</p> <p>‘Koala Warning Signs’ dispersed throughout the Ocean Drive road network (Refer to VMP (ELA 2021)</p> <p>Roadside vegetation adjacent to VMP areas will be managed to minimise the height of ground cover and therefore increase the visibility of any roadside fauna</p>			
Direct impacts from domestic animals entering the VMP areas.	Highly Likely	Moderate	High	To avoid, reduce potential for disturbance to Koala from domestic animals (dogs) in referral area (Ocean Drive residential subdivision)		<p>Construction Phase</p> <p>Implementation of Koala Management controls outlined in the CEMP</p> <p>Implement the Vegetation Management Plan (ELA 2021)</p> <p>Prohibition of dogs within the VMP areas</p>	Low to medium	<p>Operational Phase</p> <p>Routine inspection of open space areas and off leash areas by Council</p>	<p>Additional inspections of open space areas</p> <p>Additional Community Education programs</p>	

Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							
						VMP areas will be fenced and have signage to prohibit dog-entry – (Refer to VMP ELA 2021)			enforcement officers	
						Operational Phase			Records of Community Education Programs	
						Ongoing implementation of Koala Management controls contained in the CEMP				
						In public open spaces, all dogs will be required to be kept under control by their owners, in accordance with Local Government and Companion Animal Act dog ownership regulations.				
						Dogs will be required to be on a leash when entering the VMP areas. These areas will be actively managed and subject to enforcement powers under the Local Government Act				
						All public areas will be effectively signposted regarding dog exercise provisions				
						Education programs for residents regarding the				

Potential impact	Risk before mitigation measures			Management Objective / Desired Outcome	Scientific, Ecological and /or budgetary uncertainties that may prevent desired outcome	Management Mitigation Commitment	Action / Measure	Residual Risk after mitigation	Trigger, detection / monitoring activity	Adaptive Implementation Program & Measures / corrective actions
	Likelihood	Consequence	Risk							

requirements for dogs within the development

Person responsible for implementation:

- Developer Project Manager – Project Manager (PM)
- Contractor Site Supervisor – Site Supervisor (SS)
- Contractor site personnel - All

Table 8: Environmental Management Plan

Objective	Environmental Action	Timeframe	Monitoring	Responsible person
General				
To minimise the risk of environmental incidents and complaints and to effectively manage them if they occur.	All project staff and contractors will be inducted on the environmental sensitivities of the work site(s) and relevant safeguards prior to commencement. This must include other relevant contractor Induction information, if applicable.	Prior to construction	Induction records	SS
	Sign off on an agreement with other relevant contractor to cover issues of indemnity, roles and responsibilities and conditions of operation.	Prior to construction	Induction records	PM
	Other relevant contractor will be notified immediately of any complaints relating to management of environmental issues.	As required	Complaint register	SS
	To ensure compliance with Section 148 of the <i>Protection of the Environment Operations Act 1997</i> , each relevant authority must be notified of any pollution incidents.	As required	Incident reports	All
	The Water Servicing Coordinator will be notified if damage occurs to an area (vegetation, etc) outside of the nominated work area.	As required	Incident reports	SS
Topography, geology and soils				
No offsite erosion and sedimentation	The sediment and erosion control plan must be adhered to (Appendix D). Additional general control measures include: Works will not take place during or immediately after heavy rain. Vehicles are to be kept within designated areas.	Site establishment and maintained during the works	Weekly checklist, after rainfall or changes in site conditions.	SS

Objective	Environmental Action	Timeframe	Monitoring	Responsible person
Acid Sulfate Soils (ASS), Asbestos and other contaminants	Stop works and notify Other relevant contractor if any contamination (e.g. asbestos, discoloured soil, chemical or petrol odours, refuse or leachate) is discovered. The risk of acid sulfate soils is considered low, given the study area is mapped as class 3 and 5 (PMHC LEP 2011).	Site establishment and maintained during the weeks.	Weekly checklist, incident reports. Re-assessment to occur after changes in site conditions or after rainfall.	SS
Water Quality and hydrology				
No pollution of waterways by water discharge.	<p>Sediment and erosion control measures, as above and in Appendix D.</p> <p>Spill kits on hand.</p> <p>Works will cease if groundwater is intercepted. If groundwater is intercepted and dewatering is required, the successful contractor would need to determine if the anticipated volume of groundwater likely to require collection and disposal off-site will be greater than 3ML / year. And if so the contractor must obtain an Aquifer Interference approval from DPI Water. The contractor must also monitor groundwater extraction during construction and obtain a licence if needed.</p> <p>No storage of chemicals or fuels on-site.</p> <p>Vehicles / machinery will not be refuelled near open cut or exposed soil where leaching is a risk.</p> <p>Vehicles / machinery will not be refuelled near waterways.</p>	Site establishment and maintained during the works	Weekly checklist, after rainfall or changes in site conditions.	SS
Air Quality				
No off-site dust impacts. Air pollution minimised.	<p>Cover stockpiles and loads to prevent wind-generated dust and debris. Follow the dust management actions outlined in Appendix E.</p> <p>Vehicles and equipment will not be left idle when not in use, will be regularly serviced and maintained and free from visible smoke.</p> <p>Odour management would be carried out in accordance with the requirements of the POEO Act and Other relevant contractor's existing procedures, if applicable.</p>	During construction	Weekly checklist and complaints register.	SS
Waste and hazardous materials				

Objective	Environmental Action	Timeframe	Monitoring	Responsible person
No pollution to land.	<p>Collected waste will be classified prior to disposal in line with the EPA (2014) waste classification guidelines. Waste transported off-site is only to be transported to a place that can lawfully receive the waste.</p> <p>Waste bins would be stored away from waterways. Waterproof covers would be used during rain and site shutdown (i.e. weekends and nights) to prevent entry of water, pest animals and blown litter.</p> <p>A portable toilet would be located on a flat surface and maintained regularly.</p> <p>Removal and appropriate disposal of general waste generated by the contractors during the works is the responsibility of the contractors unless advised differently.</p>	During construction	Weekly checklist	SS
Aboriginal and non-Aboriginal Heritage				
No damage to known or unknown heritage items	<p>In accordance with Section 146 of the Heritage Act 1977, if an archaeological relic (such as a deposit or artefact) is uncovered during works, work must cease in the affected area and the Heritage Council of NSW notified. Further advice and consultation would be required and approvals may be required from the Heritage Council of NSW or the Heritage Division under delegation regarding any relics, should they be discovered during works.</p> <p>In the extremely unlikely event that human remains are found, works will immediately cease and the NSW Police will be contacted. If the remains are suspected to be Aboriginal, the OEH may also be contacted at this time to assist in determining appropriate management.</p> <p>If any non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify the project manager.</p>	During construction	Weekly checklist	SS
Noise and vibration				
Minimise construction and operation noise and vibration.	<p>Undertake construction work during normal business hours (7.00am until 6.00pm weekdays and 7.00am to 5.00pm on Saturdays) to minimise noise disruption.</p> <p>Ensure all plant and equipment used for the project is maintained regularly and operated in a proper and efficient manner.</p>	During construction	Weekly checklist and complaints register.	SS
Public Safety				
To protect public safety	Temporary fencing of the site to prevent public access during construction.	During the works	N/A	SS

3.5 Emergency preparedness and incident management

In the event of an environmental incident causing or threatening ‘material harm’ to the environment (indicatively, costing more than \$10,000 in clean-up (refer s.148 of the *Protection of the Environment Operations Act 1997*), the following persons / authorities must be notified in this order:

- Firstly call 000, **only** if the incident presents an immediate threat to human health or property.
- Notify the project team immediately
- Notify each authority immediately, in this order:
 - NSW EPA – 131 555
 - NSW Health Public Health Unit -Port Macquarie Office – Public Health Officer on call (6589 2120 or after hours 0428 882 805)
 - SafeWork NSW – 131 050
 - Fire and Rescue NSW – 9265 2999
 - Port-Macquarie-Hastings Council – 6581 8111 or after hours 6583 2225
 - WIRES – 1300 094 737.

Immediate verbal communication is required to each relevant authority. This is to be followed by notification in writing within seven days of the date on which the incident occurred, per section 101 of the *Protection of the Environment Operations (General) Regulation 2009*. The environmental controls to be managed by the Site Supervisor and all personnel at all relevant stages of the project are presented in Table 9.

Table 9: Incident management

Issue	Control measure
General site issues	Conduct induction training for all personnel to alert them of sensitive areas in the work zone, environmental controls via this plan and controls within the Safe Work Method Statement (SWMS) and emergency controls. Induction training must also include any other relevant induction information.
	Establish a register of complaints to record complainant contact information, details of complaint and action taken to address the complaint. A template is provided in Appendix F.
Sediment and Erosion	Ensure all soil is managed consistent with the sediment and erosion control plan (Appendix D)
	Ensure all boundaries between the development footprint and the VMP area are installed sediment fencing as per Appendix D and exclusion fencing is installed.
Water Quality	No materials would be allowed to enter waterways or stormwater drains, at any time.
Flora and Fauna	Clearing of native vegetation does not form part of the works. Machinery movement will be contained with the construction footprint in areas of cleared land.
	If fauna is found on the construction site, stop work – all native fauna is protected. Do not touch animals, but wait for them to leave. If you are unsure or if the individual looks injured call an ecologist immediately for advice, or WIRES or a rescue agency.
Aboriginal / Historic Heritage	Unexpected finds – works will cease, the relic will not be moved and the project manager will be contacted as soon as possible
	Stop work if human remains are found and contact NSW Police

Issue	Control measure
Chemical management and spills	Store chemicals (including fuel) in secondary containers with a lid; do not store chemicals onsite overnight.
	An adequate spill kit must be available on site at all times. Spills would be cleaned up immediately and waste materials disposed to a licensed waste facility in accordance with a current Material Safety Data Sheets (MSDS).
Contaminated land	If contaminated materials are found during construction, access will be restricted by using marker tape. If potential asbestos is encountered, contact a certified asbestos assessor to assess and remove any hazard. If any spoil is tested the CEMP will be amended to include specific controls for the treatment of the hazard.
	If applicable, ensure imported topsoil is accompanied by documentation stating it is Virgin Excavated Natural Material (VENM).
Onset of sudden rain	Sediment and erosion control measures will be checked and secured.

4. Monitoring

This CEMP includes a comprehensive monitoring program to ensure that management commitments are effectively implemented and any incidents of non-compliance are detected and appropriate corrective actions developed and implemented as part of an adaptive management program.

The Project Manager will be responsible for ensuring that all staff induction and training programs are implemented and all monitoring requirements are undertaken.

The purpose of the monitoring program is to ensure that the CEMP's objectives are met.

4.1 Monitoring and non-compliance

Regular environmental inspections are to be undertaken of all work activities being carried out at the project site in accordance with Table 6 and the checklist at Appendix A. Inspections shall be carried out in conjunction with personnel responsible for a particular work area and shall include the following:

- Daily and weekly Inspections of key environmental issues recorded on an Environmental Site Inspection Checklist (Appendix A) – site supervisory staff as part of their daily duties shall conduct daily inspections of the site (incl. all subcontractor activities), and issues noted in daily diaries if applicable. Near misses or non-compliances will be investigated, documented and reported with appropriate corrective action taken and documented.
- Regular Site Inspections – formal inspections by the Project Manager and Project Ecologist, recorded on an Environmental Site Inspection Checklist (Appendix A) will be undertaken. Near misses or non-compliances shall be investigated, documented and reported with appropriate corrective action taken and documented within clearly defined timeframes.
- Monthly audits – monthly audits by the Project Manager, recorded on a monthly audit Checklist will be undertaken. Near missis or non-compliances shall be investigated, documented and reported with appropriate corrective action taken and documented within clearly defined timeframes.

Where a site or operational condition that does not comply, a report is to be completed and actioned. The report for any non-compliance is to be actioned no later than within 3 working days of receiving confirmation of the noncompliance. In some instances, further investigation or monitoring may be required to establish whether the CEMP has been adequately implemented, or whether the work is compliant with relevant legislation, guidelines and statutes. In these instances, an independent party, such as an Environmental Auditor, may need to carry out the investigation or monitoring.

The notification to the relevant authority of any emergency or incident which results in the loss or damage to Protected Matters, the release of contaminants and subsequent pollution to water, air or land, will include the following information.

- The location of the emergency or incident
- The name and telephone number of the designated contact person
- The time of the release
- The time the incident occurred

- The suspected cause of the release
- The environmental harm caused, threatened, or suspected to be caused by the release
- Actions taken to prevent any further release and mitigate any environmental harm caused by the release.

In addition to the inspections and monitoring undertaken by the approval holder described above, the approval holder will be implementing the management plans and monitoring/reporting program for the VMP area.

The VMP will provide the baseline data (permanent photo monitoring points and floristic/structural data) for the condition of the vegetation in the VMP areas. These monitoring sites are required to be assessed on an annual basis to provide an audit of vegetation health and condition, extent of exotic plant cover, presence/extent of feral animal species, presence of rubbish and erosion (refer to VMP (ELA 2021)) and adaptive management actions implemented.

4.2 Records management

In accordance with Condition of Approval 11, the approval holder must maintain accurate and complete compliance records.

To meet this requirement, the following records must be kept on-site:

- all environmental training records, including signed and dated:
 - environmental inductions
 - environmental toolbox talks
 - pre-start meetings
- all fauna preclearing records
- all daily, weekly and monthly environmental inspection reports
- CEMP audit reports
- all compliance reports
- all non-conformances and incidents reports.

5. References

Biodiversity Australia (2017) *Ecological Impact Assessment: Proposed Residential Development on Lot 33 DP 754405 and Lot 12 DP1091444, Ocean Drive, Kew*. Prepared for Jojeni Investments Pty Ltd.

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Appendix A - Environmental Inspection Checklist and Corrective Action Required

Environmental Inspection Checklist- Ocean Drive Residential Development EPBC		Compliance (Yes or No)	Corrective Actions / Maintenance Required (and due date)	Corrective Actions / Maintenance Completed of responsible manager
Site/ work zone inspected:				
Time & Date:	Weather:			
VMP area				
Loss or damage to vegetation in VMP areas as a result of construction activity		<input type="checkbox"/>		
Protective fencing/ barrier erected around all VMP areas		<input type="checkbox"/>		
No damage to protective fencing/ barrier erected around all VMP areas		<input type="checkbox"/>		
Weed species stockpiled separately from other waste		<input type="checkbox"/>		
Vehicles/ plant entering and leaving site free of soil and weeds		<input type="checkbox"/>		
Erosion and/or sedimentation impacting VMP areas		<input type="checkbox"/>		
Deposition of dust impacting VMP areas		<input type="checkbox"/>		
Spread of litter and/or waste into VMP areas		<input type="checkbox"/>		
Fauna				
Loss of fauna habitat beyond approval		<input type="checkbox"/>		
Habitat trees (with hollows and/or nests) in VMP area are not damaged		<input type="checkbox"/>		
Trees or parts thereof to be re-used within VMP areas		<input type="checkbox"/>		
Tree clearing protocol is implemented for any tree clearing		<input type="checkbox"/>		
Injury or death of threatened fauna during clearing		<input type="checkbox"/>		
Road mortality of any threatened fauna during construction		<input type="checkbox"/>		
Dam dewatering protocol is implemented for any dam dewatering		<input type="checkbox"/>		

Environmental Inspection Checklist- Ocean Drive Residential Development EPBC	Compliance (Yes or No)	Corrective Actions /	Corrective Actions /
Site/ work zone inspected:		Maintenance (and due date)	Maintenance Completed (Signature/date of responsible manager)
Evidence of fauna disturbance from excessive construction noise	<input type="checkbox"/>		
Waterways			
Hazardous materials/ fuels stored securely in designated storage area	<input type="checkbox"/>		
Spill kits are available on-site in designated areas (including near fuel /haz material storage and refuelling zones) and well stocked	<input type="checkbox"/>		
No evidence of any spills or turbidity plumes in receiving water	<input type="checkbox"/>		
Refuelling/ servicing of plant/ vehicles to occur off-site or in a designated area away from water bodies/ drainage lines	<input type="checkbox"/>		
Site and waterways are free of rubbish and wastes (except within designated waste receptacles)	<input type="checkbox"/>		
Waste containers are not filled beyond capacity	<input type="checkbox"/>		
Waste containers are located away from water bodies / drainage lines	<input type="checkbox"/>		
Concrete wash-out area lined with suitable material / bunded and not filled beyond capacity	<input type="checkbox"/>		
Erosion and sediment controls are in place as per the Erosion and Sediment Control Plan	<input type="checkbox"/>		
No evidence of run off/ sedimentation downslope of any sediment controls or offsite	<input type="checkbox"/>		
Other	<input type="checkbox"/>		
	<input type="checkbox"/>		
Inspected by:	Signature:	Date:	

Appendix B - Hygiene procedures for vehicles and machinery to control the introduction and spread of *Phytophthora cinnamomii*

Guidelines taken from “Arrive Clean, Leave Clean. Commonwealth of Australia 2015

Undertake visual inspections to confirm that vehicles, plant and equipment and footwear, are free of clods of soil, slurry (water and soil mixture) and plant material. Use facilities specifically designed for cleaning vehicles, plant and equipment and footwear.

Vehicles, machinery and large equipment

Use a wash-down facility for vehicles and machinery pay particular attention to cleaning mud flaps and tyres and undercarriage. Dispose of wash-down water so that it drains back into a low area away from waterways. If this is not possible, empty it into a waste container for responsible disposal offsite. Do not allow mud and wash-down effluent to drain into bushland and surface waters, such as rivers, creeks, reservoirs and dams. Don't drive through wash-down water.

Footwear, small equipment and hand tools

Set up a wash-down area for participants to wash and dry their face and hands and clean their footwear before entering and exiting the site. To clean footwear, first use a hard brush or stick to remove as much mud, soil and organic matter as possible before disinfecting with a solution of 70% ethanol or methylated spirits in 30% water—applied through a spray bottle or a footbath. Collect all removed mud, soil and organic matter in a bag or bucket, and keep it out of clean bushland.

Appendix C - Sediment and erosion control measures

**Please note, these measures will be implemented in conjunction with the Sediment and Erosion Control Plan prepared by Hopkins 2018.

GENERAL INSTRUCTIONS

1. The Construction Manager shall ensure that all soil and water management works are located as documented or as otherwise directed by the Environmental Manager. All work shall be generally carried out in accordance with
 - a. Port Macquarie-Hastings Council Requirements
 - b. EPA requirements
 - c. NSW department of housing manual "managing urban stormwater, soils and construction", 4th edition, March 2004.
2. The Construction Manager shall maintain the erosion control devices to the satisfaction of the Environmental Manager and Port Macquarie-Hastings Council.
3. The Construction Manager is to ensure all erosion & sediment control devices are maintained in good working order and operate effectively. Repairs and or maintenance shall be undertaken as required, particularly following storm events

LAND DISTURBANCE

4. Where practical, the soil erosion hazard on the site will be kept as low as possible. To this end, works will be undertaken in the following sequence:
 - a. Install a sediment fence along the boundaries as shown on plan. Refer detail.
 - b. Construct stabilised construction entrance to location as determined by superintendent/engineer. Refer detail.
 - c. Install sediment basins as shown and install sediment traps as shown.
 - d. Undertake site development works in accordance with the engineering plans. Where possible, phase development so that land disturbance is confined to areas of workable size.

EROSION CONTROL

5. During windy weather, large, unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control.
6. Final site landscaping will be undertaken as soon as possible and within 20 working days from completion of construction activities.

SEDIMENT CONTROL

7. Stockpiles will not be located within 2 metres of hazard areas, including likely areas of concentrated or high velocity flows such as waterways. Where they are between 2 and 5 metres from such areas, special sediment control measures will be taken to minimise possible pollution to downslope waters, e.g. through installation of sediment fencing.
8. Any sand used in the concrete curing process (spread over the surface) will be removed as soon as possible and within 10 working days from placement.

9. Water will be prevented from entering the permanent drainage system unless it is relatively sediment free, i.e. the catchment area has been permanently landscaped and/or any likely sediment has been filtered through an approved structure.
10. Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised.
11. Acceptable receptors will be provided for concrete and mortar slurries, paints, acid washings, lightweight waste materials and litter.
12. Any existing trees which form part of the final landscaping plan will be protected from construction activities by:
 - a. Protecting them with barrier fencing or similar materials installed outside the drip line
 - b. Ensuring that nothing is nailed to them
 - c. Prohibiting paving, grading, sediment wash or placing of stockpiles within the drip line except under the following conditions.
 - i encroachment only occurs on one side and no closer to the trunk than either 1.5 metres or half the distance between the outer edge of the drip line and the trunk, whichever is the greater
 - ii a drainage system that allows air and water to circulate through the root zone (e.g. a gravel bed) is placed under all fill layers of more than 300 millimetres depth
 - iii care is taken not to cut roots unnecessarily nor to compact the soil around them.

Appendix D - Sediment and Erosion Control Plan (Hopkins Consultants 2018)

Appendix E - Dust management control plan

The following strategies are suggested to minimise dust from this project during the bulk earthworks stage:

- Optimise the haulage route on-site to minimise travel
- Minimise speed along haul road to 15 km/hr on unsurfaced roads and 25 km/hr on surfaced roads
- Use water cart regularly along hauls roads
- Keep a daily site log observing wind, rain, dust leaving the site, dust on flora and any actions where relevant
- Minimise the use of stockpiles, alternatively cover, seed or fence
- Ensure all trucks moving on/off site are covered
- As soon as practical, landscape/plant any disturbed areas that are completed

Appendix F - Complaints recording template

Date	Received by phone /email /fax /letter	Complaint	Name	Address	Contact	Follow-up actions	Date complete

Date	Received by phone /email /fax /letter	Complaint	Name	Address	Contact	Follow-up actions	Date complete

Appendix G - Site environmental inspection checklist (weekly)

Constructor Details		Site Supervisor - Environmental Checklist	Job No.
Project Title: Ocean Drive, Kew			
Site Inspected (enter date):			
Time & Date:		Weather:	
A	Topography, Geology & Soils	Compliance (Yes or No)	
A1	Sediment bunds installed around entry and exit points	<input type="checkbox"/>	
A2	Stormwater grates protected	<input type="checkbox"/>	
A3	No straw bales in use	<input type="checkbox"/>	
A4	No evidence of contaminated ground	<input type="checkbox"/>	
B	Water Quality, Hydrology & Drainage		
B1	Fuel & chemicals stored in secured areas (and not overnight)	<input type="checkbox"/>	
B2	Emergency Spill Kit on site	<input type="checkbox"/>	
B3	Plant & equipment leak free	<input type="checkbox"/>	
B4	Toilets located away from sensitive areas	<input type="checkbox"/>	
B5	Concrete cutting residues captured appropriately	<input type="checkbox"/>	
B6	Captured Water settlement carried out	<input type="checkbox"/>	
B7	Stationery motors stored on bunded impermeable sheeting	<input type="checkbox"/>	
B8	Vehicle wheels cleaned before entering work sites	<input type="checkbox"/>	
B9	Equipment stored outside of stormwater flow areas	<input type="checkbox"/>	
C	Flora, Fauna & Ecosystems		
C1	No unapproved vegetation clearance. Clearing does not form part of the works.	<input type="checkbox"/>	
C2	Materials stored away from drip lines of trees	<input type="checkbox"/>	
D	Air Quality & Energy		
D1	No visible dust	<input type="checkbox"/>	
D2	Measures to control dust if required	<input type="checkbox"/>	
D3	Disturbed areas progressively rehabilitated	<input type="checkbox"/>	
D4	Truck loads covered	<input type="checkbox"/>	
D5	No visible vehicle exhaust emissions for more than 10secs	<input type="checkbox"/>	
D6	No idling vehicles	<input type="checkbox"/>	
E	Heritage		
E1	Work ceased if heritage item found	<input type="checkbox"/>	
E2	Heritage induction carried out for all workers	<input type="checkbox"/>	
F	Visual Environment		

Constructor Details		Site Supervisor - Environmental Checklist	Job No.
F1	Site Tidy		<input type="checkbox"/>
F2	Spread of materials, waste minimised		<input type="checkbox"/>
F3	Equipment & materials contained within work areas		<input type="checkbox"/>
F4	Personnel maintaining tidy appearance		<input type="checkbox"/>
F5	Site secure		<input type="checkbox"/>
G	Noise & Vibration		
G1	Silencers fitted to all plant & equipment		<input type="checkbox"/>
G2	Plant & Equipment working to approved hours		<input type="checkbox"/>
G3	Noisy activities intermittent and not continuous		<input type="checkbox"/>
G4	Noise not causing nuisance to nearby residences		<input type="checkbox"/>
G5	Residents notified in advance of noisy activities		<input type="checkbox"/>
G6	Truck exhaust brakes not used near sensitive premise		<input type="checkbox"/>
H	Traffic & Access		
H1	Accesses not obstructed without prior arrangement		<input type="checkbox"/>
H2	Signs erected to inform public of the work (if required)		<input type="checkbox"/>
H3	Vehicle access/egress to roads controlled by Stop / Slow		<input type="checkbox"/>
H4	Sufficient identification / barriers for vehicle movement zones		<input type="checkbox"/>
I	Land Use & Services		
I1	Underground Services located as per SWMS		<input type="checkbox"/>
J	Waste Generation		
J1	Receptacles on site for disposal of waste		<input type="checkbox"/>
J2	Waste being recycled where possible		<input type="checkbox"/>
J3	Contaminated waste identified and sectioned off		<input type="checkbox"/>
J4	Waste classified and disposed to licensed facility		<input type="checkbox"/>
J5	Hazardous waste removed by licensed contractor		<input type="checkbox"/>
K	Other		
K1			<input type="checkbox"/>
K2			<input type="checkbox"/>
K3			<input type="checkbox"/>
Inspected by:		Signature:	Date:
Actions			

Constructor Details	Site Supervisor - Environmental Checklist	Job No.
<p>By Who</p> <p>Date Completed:</p>		

