Offset Management Plan

Narangba Quarry Expansion
Prepared for Boral Resources (QLD) Pty Limited
6 November 2019

EPBC 2014/7351
Job No. 7139

Build something great™

Declaration of Accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth).

The offence is punishable on conviction by imprisonment or a fine, or both.

I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

An extract of section 491 of the EPBC Act is attached.

Signed: _____

Full Name: Russel Wilson

Organisation: Boral Resources (Qld) Pty Limited

Date: 06/11/2019

491 Providing false or misleading information to authorised officer etc.

(1) A person is guilty of an offence if the person:
- (a) provides information or a document to another person (the ***recipient***); and
- (b) knows the recipient is:
  - (i) an authorised officer; or
  - (ii) the Minister; or
  - (iii) an employee or officer in the Department; or
  - (iv) a commissioner;

  performing a duty or carrying out a function under this Act or the regulations; and
- (c) knows the information or document is false or misleading in a material particular.

(2) The offence is punishable on conviction by imprisonment for a term not more than 1 year, a fine not more than 60 penalty units, or both.

Note: Subsection 4B(3) of the *Crimes Act 1914* lets a court fine a body corporate up to 5 times the maximum amount the court could fine a person under this subsection.

Executive summary

The Narangba Quarry Expansion was referred under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 11 November 2014 and subsequently declared a "Controlled Action" requiring assessment by "Preliminary Documentation" pursuant to section 18 and 18A (listed threatened species and communities) (EPBC Act reference 2014/7351). The trigger for the controlling provision was due to potential impacts on the Koala (*Phascolarctos cinereus*), which is listed as Vulnerable under the EPBC Act.

As part of the **Department of the Environment and Energy's** (DoEE) Preliminary Documentation requirements, an offset proposal was developed to compensate for the impacts from clearing 52 hectares of habitat critical to the survival of the Koala was prepared in consultation with the DoEE. An offset for the Narangba Quarry Expansion was originally approved as part of the Preliminary Documentation process. However, since the original approval Boral have requested a minor amendment to the offset prior to commencing the action as a result of operational requirements.

In August 2018 a variation was sought to the approval conditions that would allow Boral to deviate from the approved offset as long as it was consistent with the EPBC Act Environmental Offsets Policy. The variation was approved on 24 August 2018 and required an Offset Strategy to be submitted by 1 December 2018. An initial offset strategy was submitted prior to this date and was approved on 16 August 2019.

Condition 3A of the approval requires that the approval holder must submit an Offset Management Plan for the Minister's written approval. The Offset Management Plan must:

a) be consistent with the offset proposed in the preliminary documentation and the EPBC Act Environmental Offsets Policy (2012);
b) include performance and completion criteria to protect koalas and manage koala habitat;
c) describe the management measures that will be to achieve and maintain the performance and completion criteria, including discussion of how measures outlined take into account relevant conservation advice; and
d) include a program to monitor (including detection triggers) and report on the effectiveness of these measures, including triggers and corrective actions and progress against performance and completion criteria.

Condition 3B also requires the approval holder to legally secure the offset area specified in the offset strategy by 28 February 2020.

The offset area includes 220.9 ha of land that is the balance for Narangba quarry and includes remnant vegetation and areas requiring revegetation or rehabilitation to provide suitable habitat for Koala usage. Previous land use activities involved logging for forestry and clearing to facilitate grazing and other agricultural activities.

This Offset Management Plan has the purpose of providing high level guidance for the creation and implementation of offset mechanisms. The primary offset mechanisms include:

- The dedication as an offset of 220.9 hectares of land at Raynbird Road, Narangba with existing koala habitat values but requiring various levels of rehabilitation to improve those values.
- Rehabilitation and revegetation works to improve the condition of the offset area.
- Implementation of management actions for
    - Weeds of national significance
    - Pest management (feral and unwanted dog usage)
    - Maintaining koala habitat
    - Bush fire
- Monitoring and reporting to ensure that the offset area achieves and maintains the completion criteria.
- Adaptive management is applied to mitigate unforeseen risks and incorporate new information as it becomes available.
- Putting in place legal mechanisms available through Queensland legislation to secure the offset area by a Voluntary Declaration.

The implementation of these offset mechanisms will create a self-sustaining, continuous conservation area of high-quality Koala habitat.

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1. Introduction

The Environmental Management Division of **Saunders Havill Group** (SHG) was engaged by **Boral Resource (QLD) Pty Limited** (Boral) to prepare an **Offset Management Plan** (OMP) for the Narangba Quarry, located at Raynbird Road, Narangba. The proposal is for the 56 hectare expansion of the Narangba Quarry.

The Narangba Quarry Expansion was referred under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 11 November 2014 and subsequently declared a "Controlled Action" requiring assessment by "Preliminary Documentation" pursuant to section 18 and 18A (listed threatened species and communities) (EPBC Act reference 2014/7351). The trigger for the controlling provision was due to potential impacts on the Koala (*Phascolarctos cinereus*), which is listed as Vulnerable under the EPBC Act.

As part of the **Department of the Environment and Energy's** (DoEE) Preliminary Documentation requirements, an offset proposal was developed to compensate for the impacts from clearing 52 hectares of habitat critical to the survival of the Koala was prepared in consultation with the DoEE. An offset for the Narangba Quarry Expansion was originally approved as part of the Preliminary Documentation process. However, since the original approval Boral have requested a minor amendment to the offset prior to commencing the action as a result of operational requirements.

The Narangba Quarry extension project and offset site has been discussed with DoEE since 2014. A timeline of key milestones for EPBC Act approval of the project is provided below:

- The project was referred to DoEE on 1 October 2014 and made a controlled action with assessment by preliminary documentation on 10 November 2014.
- The controlled action decision was made due to the clearing of 52 ha of potential critical habitat for the Koala. EPBC Act approval was obtained on 19 August 2016 subject to conditions.
- An offset was negotiated and approved through the preliminary documentation report with Condition 3a of the approval specifying that the Offset Management Plan (OMP) must be consistent with the offset proposed in the preliminary documentation and the EPBC Act Environmental Offsets Policy (2012).
- The approved offset site was approximately 190 ha located adjacent to the existing quarry, consisting of a mix of remnant and regrowth vegetation as well as agricultural land requiring significant rehabilitation effort.
- At the time of approval the offset site accounted for 170% of the impact based on the agreed offsets assessment calculator.
- The offset site is within a Queensland Key Resource Area (KRA) under the State Planning Policy and the extractive resources area is considered a State Interest. Generally, the Queensland Department of Natural Resources and Mines (DNRM) supports balanced outcomes within KRAs, including use of a portion of the land as a biodiversity offset, as long as it does not impact on access to high value resources.
- After receiving the approval, and prior to lodging the OMP, Boral identified that two sections of the approved offset may be impacted by future development opportunities. It is noted that no

applications have or are currently planned to be lodged for these works, however Boral decided that the best path forward would be to remove these areas from the offset site to avoid any future conflict in uses.

- In August 2018 a variation was sought to the approval conditions that would allow Boral to deviate from the approved offset as long as it was consistent with the EPBC Act Environmental Offsets Policy. The variation was approved on 24 August 2018 and required an Offset Strategy to be submitted by 1 December 2018. An initial offset strategy was submitted prior to this date and was approved on 16 August 2019.

Condition 3A of the approval requires that the approval holder must submit an Offset Management Plan for the Minister's written approval. The Offset Management Plan must:

e) be consistent with the offset proposed in the preliminary documentation and the EPBC Act Environmental Offsets Policy (2012);
f) include performance and completion criteria to protect koalas and manage koala habitat;
g) describe the management measures that will be to achieve and maintain the performance and completion criteria, including discussion of how measures outlined take into account relevant conservation advice; and
h) include a program to monitor (including detection triggers) and report on the effectiveness of these measures, including triggers and corrective actions and progress against performance and completion criteria.

Condition 3B also requires the approval holder to legally secure the offset area specified in the offset strategy by 28 February 2020.

The Offset Management Plan must be prepared in accordance with the DoEE's Environmental Management Plan Guidelines, and the EPBC Act Environmental Offset Policy (2012) and include:

a) Detail of the offset area(s) required to address the loss of 52 hectares of koala habitat consistent with the Amended Offset Strategy dated 11 July 2019 by Saunders Havill Group (refer to **Appendix A**).
b) Detail of the proposed legal mechanism and timeframes for securing the offset area(s).
c) A map of the offset area(s) in relation to other habitats and biodiversity corridors.
d) Information about how the offset area(s) provide connectivity with other koala habitat and biodiversity corridors.
e) A description of the current condition (prior to any management activities) of the offset area(s), including baseline survey data.
f) A description of the management measures (including timing, frequency and longevity) that will be implemented, including discussion of how measures outlined take into account relevant conservation advice.
g) Performance and completion criteria for evaluating the management of the offset area(s), and detailed criteria that will trigger corrective actions.

h) A detailed program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria.
i) Potential risks to the successful implementation of the plan, and a description of the contingency measures that would be implemented to mitigate against these risks, including bushfire management plan and a pest species management plan.

The action cannot commence until the Offset Management Plan is approved by the Minister in writing.

This OMP has been developed to satisfy the requirements of the conditions of approval accompanying the controlled action determination and the *EPBC Act Environmental Offsets Policy (2012)* to guide the implementation and management of offset activities.

1.1. Offset site summary

The offset site is located adjacent to and surrounding the Narangba quarry (impact site) located on Raynbird Road, Narangba and is located approximately 35 km north-west of Brisbane. The land comprises of the following cadastral allotments:

- Lot 1 on RP167435;
- Lot 53 on RP895391;
- Lot 93 on SP193378; and
- Lot 139 on SL10320.

The proposed offset land is freehold owned by Boral and zoned as extractive industry under the MBRC. The impact site is located within a designated regional biodiversity corridor under the *South East Queensland Regional Plan 2017*. It is situated partly within and surrounding MBRC-mapped environmental offset receiving areas which intend to protect and rehabilitate habitat connectivity across the landscape.

The offset area includes land that is the balance for Narangba quarry and includes remnant vegetation and areas requiring revegetation or rehabilitation to provide suitable habitat for Koala usage. Previous land use activities involved logging for forestry and clearing to facilitate grazing and other agricultural activities.

The offset area is a subset of the balance for Narangba quarry, accounting for a total of 220.9 ha. Offset areas are situated within the northern and southern extents of the site.

Surrounding land uses include rural activities and rural residential properties. The surrounding landscape consists of a matrix of cleared, degraded and intact vegetation where dams associated with residential properties and water sources exist.

The offset site is shown on **Plan 1**.

1.2. Environmental outcomes and objectives

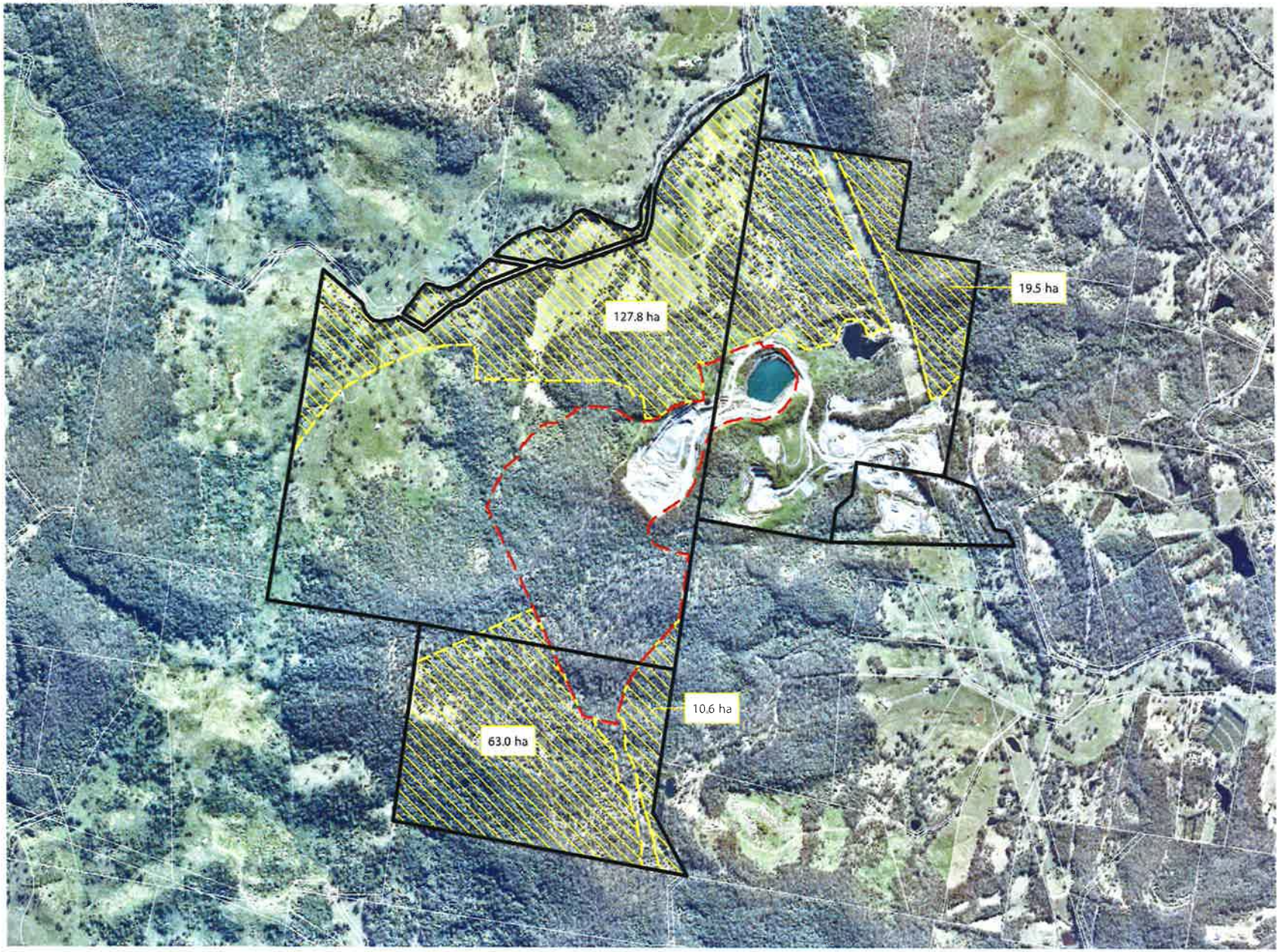
In accordance with the EPBC Act approval, the environmental outcomes to be achieved through implementing the OMP for the offset area are:

- Improve koala habitat quality in remnant vegetation areas from a condition value of 7 to a value of 8 out of 10.
- Improve koala habitat quality in habitat rehabilitation and revegetation areas from a condition value of 6 to a value of 8 out of 10.
- Facilitate adaptive management of the offset area including the nomination of milestone targets and a monitoring program.
- Annual compliance reporting detailing the implementation of management measures and achievement towards, and maintenance of, performance and completion criteria.

The management objectives for the offset area, in alignment with the EPBC Act Environmental Offsets Policy will:

- Deliver an overall conservation outcome that improves the viability of habitat for the koala.
- Provide a direct offset that is in proportion to the level of statutory protection that applies to koala habitat.
- Be of a size and scale proportionate to the residual impacts on koala habitat.
- Effectively account for and manage the risks of the offset not being successful with the required management timeframe.
- Provide a conservation gain additional to what is already required by a duty of care or to any environmental planning laws at any level of government.
- Be efficient, effective, timely, transparent, scientifically robust and reasonable with appropriate transparent governance arrangements in place for measuring, monitoring, auditing and enforcing the management of the offset area.

1. Offset Area



Legend

Qld DCDB

Boral landholdings

Impact site

Amended offset area (220.9ha)

NOTE - Houses, sheds, environmental monitoring stations, Koala fodder plantation and relevant access is excluded from offset areas

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2. Offset property values

2.1. Bioregional context

Queensland has been sub-divided into thirteen (13) biogeographical areas to identify biodiversity features at a regional scale. The offset area is located in the south-east Queensland (SEQ) Bioregion. The SEQ Bioregion shares its western boundary with the Brigalow Belt Bioregion, and extends from the Border Ranges on the New South Wales border, north to the dry coastal corridor between Gladstone and Rockhampton (DEHP 2016). The McPherson Range borders the southern boundary of the bioregion while the Great Dividing Range is to the west. Ranges extend north south through the central region creating an altitudinal gradient from the coast. Small volcanic plugs remain in the landscape offering distinctive conditions for taxa and ecosystems (DEHP 2016). Large sand islands off the coast offer unique environments and create sheltered bays and passages within which marine and coastal plants and animals thrive (DEHP 2016).

The offset area forms part of the SEQ regional biodiversity corridor which spans from the Noosa headland in the north, down to Mount Barney and Lamington National Park on the Queensland border. The SEQ regional biodiversity corridor aims to encompass large tracts of vegetation, terrestrial connectivity, aquatic connectivity, species richness, diversity and refugia, ecosystem representation and uniqueness and climate resilience areas (Queensland Government 2017).

The SEQ biodiversity corridor forms part of the Great Eastern Ranges (GER) terrestrial corridor which extends from the mountains of Victoria to the Atherton Tablelands in far north Queensland (Mackay, Watson & Worboys 2010). The GER corridor provides habitat and movement for a range of species that have Federal, State and Local significance, supports significant cultural heritage values and offers scenic amenity and outdoor recreation opportunities (Mackay *et al.* 2010).

The offset area will improve and conserve freehold land within the SEQ biodiversity corridor in an area dominated by rural activities and rural residential properties. The surrounding landscape consists of a matrix of cleared, degraded and intact vegetation. Securing and rehabilitating this land will provide a large area of habitat that would support a resident koala population as well as improve connectivity within the biodiversity corridor.

2.2. Habitat values

The impact and the offset sites have been assessed using a modified version of the Queensland State Governments *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017. The purpose of the Guideline is to provide a methodology for proponents to measure the habitat quality of a land-based offset under the **Queensland Environmental Offset Policy** (QEOP). This methodology has been adopted and modified to assess the impacts and offsets relating to **Matters of National Environmental Significance** (MNES) as a result of the Narangba Quarry Expansion. The methodology is henceforth referred to as the **Modified Habitat Quality Assessment** (MHQA). Detailed outcomes of the assessment are included in Appendix A with results summarised below.

2.2.1 Impact Area

The impact site was found to be relatively disturbed due to past land uses of rural practices. The understorey shows evidence of regular slashing, where grass was overgrown at the time of inspection and vegetation within the shrub layer was largely absent. Vegetation within the impact area is a combination of remnant and non-remnant. The remnant vegetation was mapped as Least Concern RE12.11.3 and composite Of Concern RE12.11.18/12.11.3/12.11.14 (refer **Plan 2**). On-ground findings suggest vegetation is reflective of RE12.11.3 and RE12.11.18.

A total of three (3) SAT surveys were completed across the impact site by SHG during February 2019. All of the SAT surveys provided results that suggested a low-density Koala population was utilising the site. Two of the three SAT surveys provided no evidence of Koala usage, where one SAT survey provided evidence of Koala usage. This SAT survey was undertaken within the southern extent of the impact site, located within non-remnant vegetation. Koala usage at this site was calculated to be 16.67 % which equates to low-density utilisation under the East Coast (med-high) activity category.

The MHQA was applied separately to the 'remnant' and 'non-remnant' vegetation across the impact site, taking into consideration the many variables that influence the total habitat quality and species stocking rate. The assessment resulted in a habitat score of 6 out of 10 for the impact site. Based on a clearing area of 52 ha the **Quantum of Impact** from the action is **31.2 ha**.

2.2.2 Offset Area

The proposed offset area includes remnant vegetation and areas requiring either rehabilitation or revegetation to provide suitable habitat for Koala usage. The offset area can be split into three distinct sections within the balance surrounding the Narangba quarry and expansion footprint (**Plan 2**). Each distinct section is proposed to receive varying levels of management to offset residual impacts from the impact site on Koala. The offset will strengthen Koala habitat connectivity through the region by retaining existing remnant vegetation patches and revegetating and rehabilitating disturbed areas between these patches.

The condition of the vegetation within the offset area varies, however, the characteristics are similar across the site where Eucalypt and Corymbia species are dominant within the canopy layer, and the shrub and ground layer is disturbed with infestations of *Lantana camara* (Lantana) and other mixed exotic and native species. The exception to this is the areas identified to be revegetated which have extremely little canopy cover, consisting mostly of pasture grasses.

The three distinct sections identified across the offset site requiring either rehabilitation or revegetation to provide suitable habitat for Koala usage can be described as the following:

- Remnant vegetation – areas identified as remnant vegetation are those areas of existing vegetation mapped under the VMA as remnant. These areas were observed as having the potential to still be disturbed from surrounding land uses, understorey clearing and/or weed invasion.
- Habitat rehabilitation – areas identified as being currently degraded in some way through disturbance and/or weed invasion. Works are to be undertaken within these zones to improve the

condition including weed management, natural regeneration, seeding and infill planting as required.

- Habitat revegetation – areas identified as being mostly devoid of vegetation, where grazing and other agricultural practices occurred in the past, or are currently occurring. These areas require significant planting and on-ground works to establish vegetation communities reflective of the nearby remnant vegetation.

Field surveys identified that remnant vegetation on-site was in good condition, with some evidence of disturbance within the understorey through the presence of weeds and exotic species. Habitat rehabilitation areas displayed a continuous and relatively undisturbed canopy, however, often had heavily disturbed understoreys. Conversely, habitat revegetation areas contained little to no canopy trees and a high level of weeds and grass species.

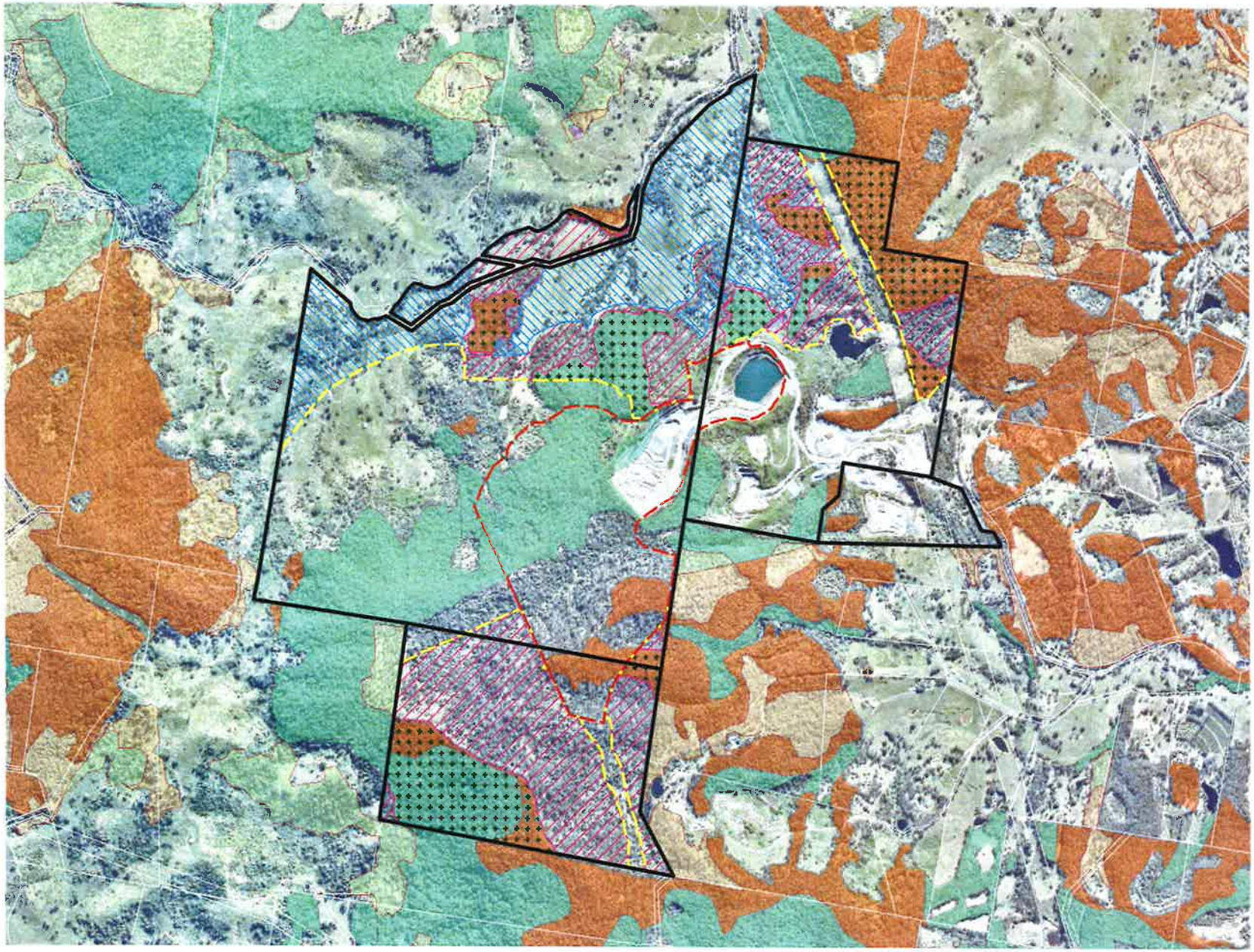
Through utilising the results of the MHQA surveys completed across the impact and offset site, a percentage of the total impact area offset is attained. This is achieved through utilising the Offset Assessment Guide (OAG) developed to determine offset requirements under the EPBC Act. OAG parameters are not addressed in detail in this document as these have been addressed separately with DoEE who make the final decision on parameters utilised.

For the Narangba Quarry extension, the assessment identified that more than 100% of the impact will be offset of the proposed site. The outcomes of the assessment are summarised in **Table 1**. Detailed analysis is provided in Appendix A.

Table 1: Offset Site Summary

OFFSET ASSESSMENT SUMMARY			
Impact Site	**Size (ha)**	**Habitat Score**	**Quantum of impact (ha)**
Habitat clearing	52	6/10	32.1
Offset Site	**Size (ha)**	**Adjusted area (ha)**	**% of impact offset**
Remnant vegetation	57.9	6.32	20.24%
Rehabilitation	101.9	16.55	53.03%
Revegetation	61.1	9.77	31.3%
Total	**220.9**	**32.64**	**104.57%**

2. Offset Area - Zones



Legend

- Qld DCDB
- Boral landholdings
- Impact site
- Amended offset area
- Remnant Vegetation Management Areas (57.9 ha)
- Habitat Rehabilitation Areas (101.9 ha)
- Habitat Revegetation Areas (62.7 ha)

Regional ecosystems

- Category A or B area containing of concern
- Category A or B area that is least concern
- Category C or R area containing endangered
- Category C or R area containing of concern
- Category C or R area that is of least concern

NOTE - Houses, sheds, environmental monitoring stations, Koala fodder plantation and relevant access is excluded from offset areas

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3. Offset area management

3.1. Offset Area Staging

Delivery of the offset site will be staged to coincide with the staging of the quarry extension. The quarry and offset will be implemented over three stages as outlined in **Table 2** and shown on **Plan 3**.

Delivery of the offset will occur in the following manner:

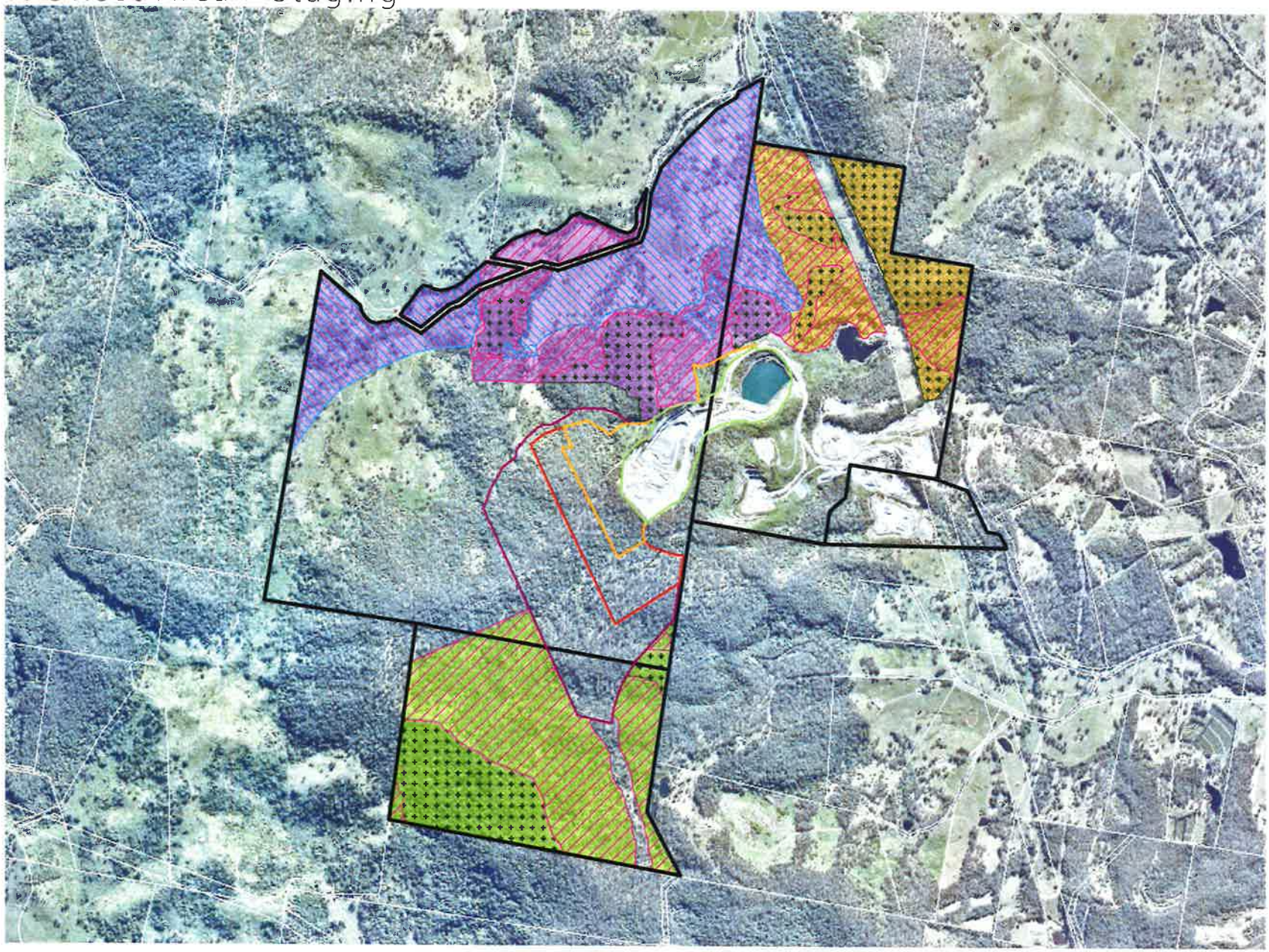
- The entire offset site will be legally secured through a Voluntary Declaration before 28 February 2020.
- Stage 1 offset areas will commence within 12 months of the action commencing with a koala habitat score of 8 to be achieved after 10 years.
- Stage 2 offset areas will commence within 12 months of commencing stage 2 clearing. A koala habitat score of 8 will be achieved within 20 years of commencing stage 2 clearing.
- Stage 3 offset areas will commence within 12 months of the last stage of clearing. A koala habitat score of 8 will be achieved within 20 years of commencing stage 3 clearing.

Staging will ensure the offset area provides adequate compensation for any clearing of koala habitat associated with the implementation of the action during all stages of quarry development.

Table 2: Quarry and Offset Staging

Stage	Indicative resource	Koala habitat cleared	Offset Area
1	10 years	9 ha	73.7 ha
2	20 years	13 ha	41.1 ha
3	40+ years	30 ha	106.1 ha

3. Offset Area - Staging



Legend

Qld DCDB

Boral landholdings

Remnant Vegetation Management Areas (57.9 ha)

Habitat Rehabilitation Areas (101.9 ha)

Habitat Revegetation Areas (62.7 ha)

Quarry Staging Clearing

Existing quarry

+10yrs (9 ha)

+20yrs (13 ha)

Final 60yrs (30 ha)

Offset Staging

Stage 1 (73.7 ha)

Stage 2 (41.1 ha)

Stage 3 (106.1 ha)

NOTE - Houses, sheds, environmental monitoring stations, Koala fodder plantation and relevant access is excluded from offset areas

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3.2. Management and monitoring measures

This section describes the management actions and measures necessary to meet the identified environmental outcomes of the offset area. The management measures are designed to minimise the risks associated with key threatening processes to the koala and maintain the quality of the habitat within the offset area.

Although the management measures have been developed to achieve the required koala offset environmental outcomes as a priority, they will bring an overall improvement in the condition and quality of a wide range of native species present within the offset area. Management actions include:

1) Legally secure the land through a *Voluntary Declaration* under the VMA.
2) Develop and implement a management plan for weeds of national environmental significance (WONS).
3) Develop and implement a management plan for feral and pest fauna species.
4) Develop and implement a bushfire management plan for the offset site.
5) Improve koala habitat through regeneration and rehabilitation.

These measures are outlined below and deemed to be suitable given the listed status of the koala, the size and scale of the offset and the focus on priority management actions, which are efficient, effective, timely and transparent (i.e. able to be monitored and are auditable). Additionally, a number of these measures correspond to Priority Management Actions outlined in the *Approved Conservation Advice for Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory) (koala Northern Designatable Unit)* (Conservation Advice).

3.2.1 Management Action 1 – legally securing the offset area

A Voluntary Declaration will be placed over the entire offset area to legally secure the conservation use on the land prior to the action commencing. Boral will continue to manage the offset area for the life of the approval. Legally securing the offset area is listed in the Conservation Advice as a Priority Management Action, under "habitat loss, disturbance and modification". As required by the conditions of approval the Voluntary Declaration will be in place by 28 February 2020.

Measures to provide physical security of the offset area are already in place. The offset area is private land owned by Boral and includes an operating quarry on part of their landholdings. Access to the site is restricted to Boral employees and sub-contractors and the site is actively monitored for trespassers. The offset areas are difficult to access from the road and there have not been any significant trespassing issues recorded. If any illegal access points are observed on Boral land, measures such as fencing or bollards would be put in place to cease the activity.

The quarry is also regulated under the *Mining and Quarrying Safety and Health Act 1999*. Any persons seeking permission to access the site must report to the Site office for permission and relevant inductions as per the provisions of the Act and Boral's strict safety requirements.

3.2.2 Management Action 2 –WONS management

The control of weeds is fundamental to improving biodiversity and the ecological condition of the koala habitat within the offset area. The historical land uses across the offset area have resulted in the introduction, spread and persistence of a variety of environmental weeds. Whilst there have been a wide variety of environmental weeds recorded across the site, the key species to be controlled in the offset area in regard to koala habitat values is *Lantana camara* (Lantana), a Weed of National Significance (WONS). The listing and prioritisation of WONS is a joint initiative of the States, Territories and Australian Government and their long-term control is of national interest.

It is not possible to remove lantana from the offset area on a single occasion, as there will be a persistent seed bank that can remain viable for long periods of time. Germination can occur rapidly after the parent plant has been removed due to increases in light and resource availability. It is therefore important that the offset area is revisited following the initial treatment for follow-up weed control and to prevent seed set and dispersal. Baseline weed mapping will be conducted before the weed removal program is initiated. Weed mapping is then to be conducted annually and reported in the **Annual Compliance Report** (ACR).

Management measures for the control of WONS, specifically Lantana will include:

- Baseline weed mapping for WONS will be conducted and specific treatment techniques developed within six months of the commencement of each stage of clearing for the quarry extension.
- All identified WONS will be treated within 12 months of the commencement of each stage of clearing for the quarry extension.
- A suitably qualified bush regeneration contractor will be engaged to undertake the necessary weed control.
- Control of infestations will utilise techniques that avoid disturbance to surrounding areas.

WONS, and other high risk weeds, will be monitored annually until they are not observed, at which point monitoring will be carried out every 2 years until they are consistently identified at densities less than 10% of the baseline infestation. The monitoring will be undertaken during the same time of year, each year, to ensure that the timing is consistent and aligns with the baseline assessment. The following procedures will be implemented to ensure that the annual monitoring event aligns with the baseline monitoring methodology:

- GPS locate the presence of weeds either via a GPS waypoint or where a large weed infestation is present, create a GPS polyline and walk the extent of the infestation.
- On a field datasheet, detail the time of year of the monitoring event, list of observed WONS, photo location and direction and notes of any notable positive and/or negative changes in weed density and coverage.
- Carry the previous year's weed survey mapping, field datasheet and photos for noting changes in weed infestations and densities.
- Transfer GPS data to the necessary programs to generate weed survey mapping extent and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring purposes.

3.2.3 Management Action 3 – feral and pest fauna species management

Feral or unwanted domestic dogs have been identified as a key threatening process under the EPBC Act, and are confirmed as a direct predation risk to Koalas. Managing animal predation is listed as a Priority Management Action under the koala Conservation Advice. The control and prevention of invasive animal incursions is to be undertaken in accordance with the relevant legislation (such as the Commonwealth *Biosecurity (Consequential Amendments and Transitional Provisions) Act 2015* and the Queensland *Biosecurity Act 2014*) and to include the control of pest animals by legal methods by suitably qualified pest management contractor(s). Any required hazardous materials must be handled and stored in accordance with the material's safety data sheets and the Approved Code of Practice for the Storage and Handling of Dangerous Goods. Pest animal control is to be undertaken in a humane manner. Annual pest monitoring is to be reported and included in the ACR.

Management measures for the control of feral or unwanted domestic dogs across the offset area include:

- Baseline pest monitoring including motion activated cameras and scat analysis to identify evidence of feral or unwanted dogs (and other pest species), and development of a property wide feral animal management program specifying techniques (trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) to be utilised, will be completed within 12 months of commencement of the action.
- Where practical and appropriate, participate cooperatively in pest management planning and implementation with local land managers (government departments, local governments and utility providers) to ensure effective pest management in the locality of the offset area.
- Install appropriate signage informing the area is under feral control.

As the management of feral and pest species can only be achieved at a landscape level, management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension.

Pest animal management and monitoring will be undertaken in accordance with the *Biosecurity (Consequential Amendments and Transitional Provisions) Act 2015* (Cwlth) and the *Biosecurity Act 2014* (Qld), which, in general, require all reasonable and practical steps to prevent or minimise biosecurity risks; minimise the likelihood of causing a 'biosecurity event'; and the limitation of consequences if such an event is caused. The control of pest animals will be undertaken using legal methods, by suitably qualified pest management contractor(s). Pest animal control is to be undertaken in a humane manner.

The following pest animal monitoring methodology will be implemented:

- GPSs will be used to locate the presence of pest animals, in particular feral dogs via notable tracks or scats.
- Field datasheet detailing the time of the monitoring event, observed pest animal scats or tracks, photo location and notes of any evidence of positive and/or negative changes in pest animal occurrence.

- Carry the previous year's pest animal survey mapping, field datasheet and photos for noting positive and/or negative changes in pest animal occurrences.
- Transfer GPS data to spatial data programs to generate pest animal occurrences and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring and reporting purposes.
- Where pest animal presence is detected, targeted trapping and baiting programs will be implemented on completion of the monitoring program.

Annual pest monitoring will be reported and outcomes of that monitoring included in the ACR. The annual pest management report is to provide detail on detected pests, control efforts, and total trapped/baited individuals during the given management period and identified trends of the population of pest animals within the offset area.

3.2.4 Management Action 4 – bush fire management plan

An Offset Area Bushfire Management Plan (BMP) will be developed within 12 months of the offset being legally secured, for the purpose of protecting the offset area from high intensity wildfires as well as for conducting ecological burns with the aim to enhance biodiversity in line with the Regional Ecosystem Description Database fire management guideline.

The Bushfire Management Plan will be prepared by a suitably qualified professional and will detail: current vegetation condition and fire risk, locations of current and required firebreaks and fire control lines, current fuel loads, ongoing monitoring measures and recommended actions and timeframes for maintenance of bushfire risk within the context of the adapted Regional Ecosystem Description Database guidelines and biodiversity outcomes sought for the offset area.

Management measures will be outlined in the BMP for the control of bush fire across the offset area but will include:

- Installation of firebreaks and fire trails.
- Annual inspection and maintenance of firebreaks and access tracks required to achieve compliance with Offset Area Bushfire Management Plan.
- Prescribed burning undertaken in consultation with, and under the guidance of the Queensland Rural Fire Brigade and in compliance with the *Fire and Emergency Services Act 1990*.
- Use of domestic livestock or other methods to reduce fuel loads in the event that a fire risk professional (e.g. representative of Queensland Rural Fire Service) and a suitably qualified person deem that conditions are not suitable for an ecological burn and that grazing is appropriate to manage a high level of fire risk. Level of risk (and any need to repeat this grazing cycle) is to be re-assessed by the aforementioned professionals following the grazing event.

As the management of bush fires can only be achieved at a landscape level management will be carried out over the entire offset area within 12 months of commencing Stage 1 of the quarry extension.

Monitoring requirements will be informed by the bush fire management plan and include regular review of access tracks, fire breaks, fuel loads and outcomes of controlled burns or other management techniques such as use of livestock.

3.2.5 Management Action 5 – koala habitat improvement

Rehabilitation and regeneration is a key action that will improve existing koala habitat values within the offset area, while also expanding habitat values in areas that have been previously cleared or subject to weed infestation issues. It also is a Priority Management Action listed under "Habitat Loss, Disturbance and Modification" of the Conservation Advice for the koala. The offset area has been separated into three zones for implementation of koala habitat improvement measures; remnant vegetation, habitat rehabilitation and habitat revegetation. All areas within the offset site will be subject to management actions 1 through 4 (voluntary declaration, WONS management, feral and pest fauna species management and bush fire management) however additional management measure will be implemented for each zone. These are:

Remnant vegetation

- Stop activities reducing habitat values, specifically selective logging and grazing.
- Assisted natural regeneration practices where removed weeds leave open areas – replanting with locally endemic species.
- Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage.

Habitat rehabilitation

- Assisted regeneration, seeding, or planting of endemic canopy tree species specifically selected to provide Koala habitat.
- Removal of impediments to Koala movement such as old fences.
- Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage.

Habitat revegetation

- Implementation of rehabilitation techniques that aim to promote the regeneration of native vegetation and improve habitat values:
    - Where natural regeneration is ineffective, implementation soil amelioration and seeding with native endemic seeds,
    - Where natural regeneration and / or seeding is ineffective, planting of endemic trees and shrubs specifically selected to provide Koala habitat
- Management of the revegetated areas to ensure habitat density requirements are achieved.
- Removal of impediments to Koala movement such as old fences.
- Protecting revegetated areas from cattle and horses through the implementation of fauna friendly fencing.
- Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage.

A rehabilitation plan specifying techniques, species to be utilised and ongoing monitoring measures to assess rehabilitation success will be completed within 12 months of the commencement of the corresponding quarry extension stage (refer to Plan 4). All rehabilitation activities are to be carried out by a suitably qualified bush regeneration contractor.

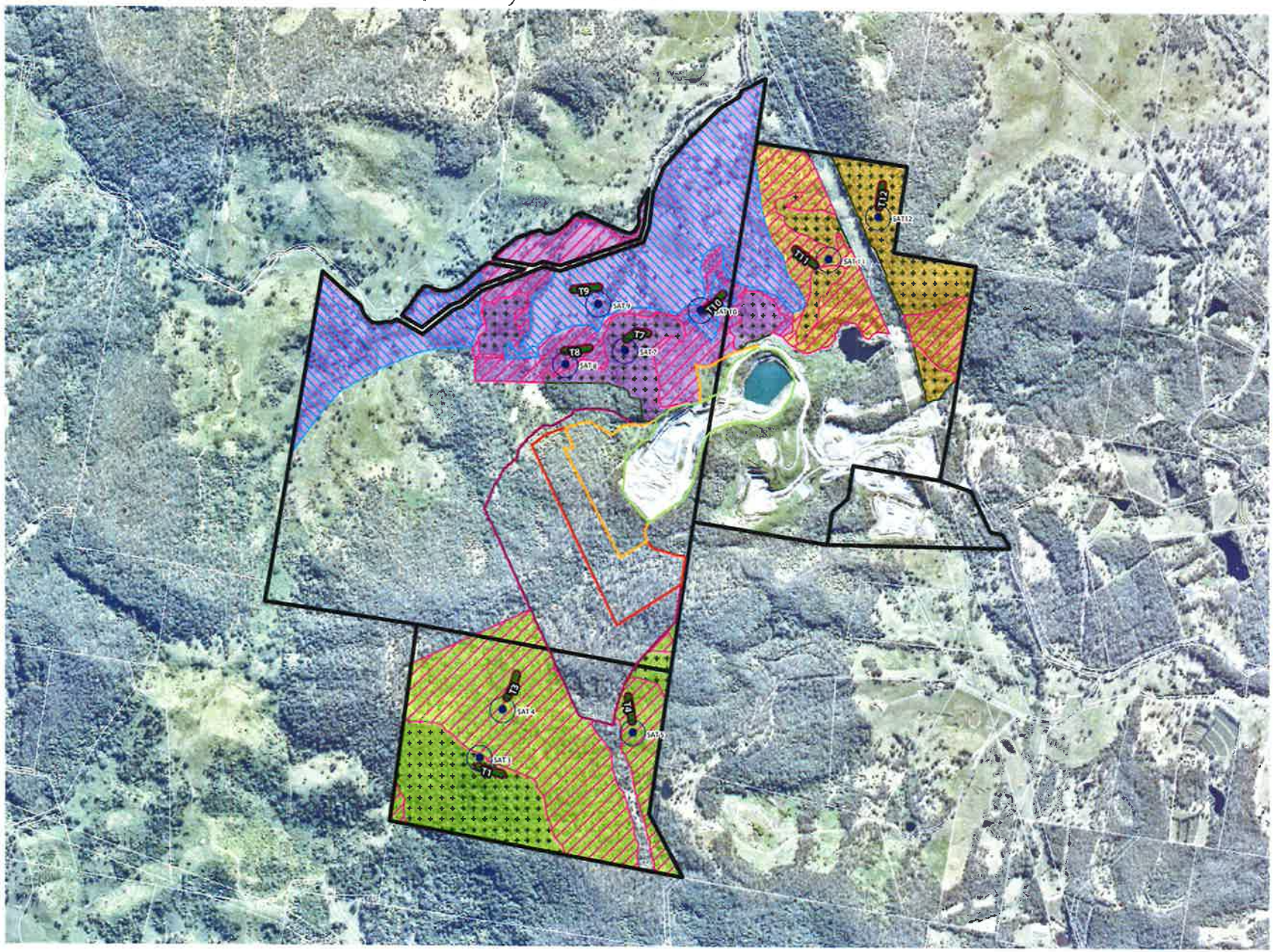
Some cattle grazing occurs in paddocks in the northern extent of the offset site. Cattle will be excluded from areas where revegetation and planting has occurred and the activity will be progressively ceased over the site as the rehabilitation activities are implemented. Some minor grazing may still occur in offset areas as part of the fire management regime, in accordance with fuel management practices to be established in the Bushfire Management Plan.

Monitoring of the koala habitat will include the MHQA which provides a repeatable and consistent method for determining habitat quality specific to koalas. The method also utilises benchmark scores to ensure all sites measured are calibrated against a known standard. This calibration provides additional confidence and assurance in the accuracy of the method to score habitat quality.

The habitat quality monitoring will be undertaken in the same locations baseline assessment were carried out (refer to **Plan 4**) which includes three transects in stage 1, two transects in stage 2 and four transects in stage 3. Koala usage monitoring will also be carried out as part of the habitat monitoring. Surveys will be carried out using the Spot Assessment Technique (SAT) at all of the transect locations.

Habitat quality monitoring will be undertaken annually for the first three (3) years and then once every five (5) years to determine if the target quality score has been maintained for the offset area. The habitat quality monitoring is to be reported in the ACR every five (5) years or the subsequent year that the monitoring is completed.

4. Offset Area - Habitat Quality Transect



Legend

Qld DCDB

Boral landholdings

Remnant Vegetation Management Areas (57.9 ha)

Habitat Rehabilitation Areas (101.9 ha)

Habitat Revegetation Areas (62.7 ha)

Quarry Staging

Existing quarry (17.4 ha)

+10yrs (11.4 ha)

+20yrs (13.6 ha)

Final 60yrs (33.8 ha)

Offset Staging

Stage 1 (73.7 ha)

Stage 2 (41.1 ha)

Stage 3 (106.1 ha)

SAT location

Habitat Quality Transect

NOTE - Houses, sheds, environmental monitoring stations, Koala fodder plantation and relevant access is excluded from offset areas

saunders havill group

BORAL

Narangba Quarry

4. Risk assessment

A qualitative risk assessment which considers the risks of achieving the objectives and outcomes for the offset site is presented in **Table 3**. The risk assessment is completed in accordance with the EPBC Act Environmental Management Plan Guidelines (2014) and characterises risk as low, medium, high or severe, as derived from the likelihood (highly likely, likely, possible, unlikely, rare) and consequence (minor, moderate, high, major and critical) risk matrix.

The risk analysis assesses the risk of failure to achieve the OMPs management objectives. It is necessary to re-evaluate and modify the risk analysis and contingency measures throughout the period of EPBC Act approval, particularly if any unforeseen risks emerge or any negative outcomes identified are greater than expected.

During the first five (5) years of monitoring and annual compliance reporting, **Boral** will engage a suitably qualified person to review management commitments in this plan, and if the review results in the need to revise the OMP, the plan will be revised and the DoEE informed in writing in accordance with the condition 9 of the approval. It is noted that events are only addressed once in the risk assessment under the most relevant management objective, however some events are likely to impact on multiple management objectives.

Table 3: Risk assessment for the management objectives

Management objective	Event or consequence*	Likelihood	Consequence	Risk level	Trigger	Contingency/s	Related monitoring activity
Maintain or improve habitat quality score	Unplanned fire causing degradation of habitat quality through the loss of native plant diversity and abundance within the offset area.	Unlikely	High	Medium	Unplanned fire outbreaks.	In the event of an unplanned fire adversely impacting the offset area, fire management measures will be reviewed in consultation with Moreton Bay Regional Council and Queensland Fire Services.	Ongoing during the monitoring and maintenance of the offset area and the annual monitoring of the replanting and regeneration.
	Unauthorised access and use of the offset area by 4WD, trail bikes and ATVs, resulting in degradation of habitat within the offset area.	Unlikely	Minor	Low	Evidence of unauthorised access, such as tracks, soil disturbances, rubbish, damaged barrier fencing or degradation to native vegetation.	Investigate the entry location, with GPS points and photographs noting tyre tracks and damage circumventing barrier structures. Repairable damage is to be remediated as soon as possible, however where a barrier is in disrepair and unable to prevent access, the barrier is to be replaced within 30 days of detection. Review and audit the control measures and the timing and frequency of the management actions.	Ongoing during the monitoring and maintenance of the offset area and the annual monitoring of the replanting and regeneration.
	Habitat quality score decreases from baseline score	Unlikely	Moderate	Low	Monitoring and ACR identifies that the habitat quality score has decreased from the baseline score, or an unplanned event causes significant damage to offset area.	Investigate cause of decrease in score. Repairable damage is to be remediated. Review and audit the control measures and the timing and frequency of the management actions. Replanting of lost stock to ensure specified densities are met.	Ongoing during the monitoring and maintenance of the offset area and annual monitoring.

Management objective	Event or consequence*	Likelihood	Consequence	Risk level	Trigger	Contingency/s	Related monitoring activity
Control WONS	Increase in WONS infestations, specifically Lantana.	Unlikely	Minor	Low	Annual weed mapping indicates that weed coverage percentage has increased by Year 5.	Investigate cause of WONS infestation. Remedial action will include revising the control measures for the species and revising the timing and frequency of the management action.	Annual weed monitoring.
	WONS infestations inhibiting the maintenance of ecological condition and habitat quality score.	Unlikely	Minor	Low	Annual weed mapping indicates that weed coverage percentage has increased by Year 5.	Investigate cause of WONS infestation. Remedial action will include revising the control measures for the species and revising the timing and frequency of the management action.	Annual weed monitoring.
Replanting and regeneration	High rainfall or flood events create exacerbated areas of erosion and degradation habitat quality in rehabilitation areas.	Possible	Minor	Low	Evidence of new sheet or gully erosion within the offset area. Or, the loss of revegetation stock utilised to stabilise identified erosion points.	Promote vegetation establishment and stabilisation through the use of alternative rehabilitation measures (i.e. jute matting). Replanting of lost stock to ensure specified densities are met.	Inspect access tracks, creek line crossings and internal creek lines within seven (7) days following high rainfall or flood events and when it is safe to do so.
	Newly planted areas do not establish as expected	Unlikely	Moderate	Low	Monitoring and ACR identifies that replanted areas are not achieving establishment criteria, or an unplanned event causes significant damage to vegetation.	Investigate cause of issue. Repairable damage is to be remediated as soon as possible. Review and audit the control measures and the timing and frequency of the management actions. Replanting of lost stock to ensure specified densities are met.	Ongoing during the monitoring and maintenance of the offset area and the annual monitoring of the replanting and regeneration.
Control predation	Presence of foxes, feral and unwanted dog usage within the offset area.	Unlikely	Moderate	Low	Annual pest monitoring indicates the presence of feral or unwanted dogs.	Increase the level of targeted trapping and baiting by a suitably qualified pest management	Annual pest monitoring and reporting.

Management objective	Event or consequence*	Likelihood	Consequence	Risk level	Trigger	Contingency/s	Related monitoring activity
						contractor. Review and audit the invasive animal control measures to evaluate their effectiveness and revise the measures accordingly.	
	Predation of koalas by feral or unwanted dogs.	Unlikely	Moderate	Low	Evidence of predation on Koala by dog, or annual pest monitoring indicates the presence of feral or unwanted dogs.	Increase the level of targeted trapping and baiting by a suitably qualified pest management contractor. Review and audit the invasive animal control measures to evaluate their effectiveness and revise the measures accordingly.	Annual pest monitoring and reporting.

5. OMP Implementation

5.1. OMP reporting and process management

The timing of management actions, performance review, risk management and responsibilities for delivery of the OMP will be undertaken in accordance with **Table 4**.

Table 4: OMP actions, timing and responsibilities

Action	Frequency and timing of action(s)	Responsible person(s) for activity
OMP monitoring reporting as part of the ACR	Annually	Suitably qualified environmental professional as directed by the Offset Area Manager.
OMP review	Every three years or upon failure to meet performance criteria	Suitably qualified environmental professional as directed by the Offset Area Manager.
OMP auditing	Annually	Suitably qualified environmental professional as directed by the Offset Area Manager.
Risk management implementation	Annually	Suitably qualified environmental professional as directed by the Offset Area Manager.
Adaptive implementation program and contingency response	Annually	Suitably qualified environmental professional as directed by the Offset Area Manager.

5.2. Performance and completion criteria

5.2.1 Performance criteria

Monitoring results will be used to determine if the following performance criteria are met, as interim outcomes and targets, prior to completion criteria being achieved. These criteria provide an indication of the success of the management measures being implemented for koala habitat offsets, and serve as trigger values where failure to achieve will result in the implementation of corrective actions. Performance criteria are provided for each of the management actions below:

Management Action 1 - legally securing the offset

- A voluntary declaration will be placed over the offset site by 28 February 2020.

Management Action 2 – WONS management

- Baseline weed mapping completed for the offset site and a weed management strategy developed and implemented within 12 months of each stage of clearing commencing.

- All WONS identified on site to be treated within 12 months of each stage of clearing commencing.
- WONS are treated until coverage stabilises to less than 10% of baseline coverage.

Management Action 3 – feral and pest fauna species management

- Baseline monitoring of feral or unwanted dogs completed for the whole offset site within 12 months of stage 1 clearing commencing and a management strategy developed.
- Feral or unwanted dogs will be minimised through ongoing monitoring and management.
- The pest management strategy will be updated annually based on the outcomes of monitoring.

Management Action 4 – bush fire management

- An Offset Area Bushfire Management Plan (BMP) will be developed within 12 months of stage 1 clearing commencing.
- Fuel levels and burning regime maintained in accordance with the Offset Area Bushfire Management Plan.
- Vegetation composition not negatively affected by fire regime.

Management Action 5 – koala habitat improvement

- Rehabilitation plans for each stage of offset delivery developed within 6 months of the commencement of the corresponding clearing stage.
- Natural regeneration, seeding or planting to commence within 12 months of the commencement of the corresponding quarry clearing stage.
- Planted areas will have a 90% plant survival rate after 12 months of planting being carried out.
- Areas allowed to regenerate will display signs of native vegetation regrowth at rates expected for those species.
- Habitat quality monitoring will be completed annually for the first three years after commencement of the operation and every five years ongoing.
- Habitat quality will be maintained at the current values (7/10 for remnant areas and 6/10 for rehabilitation and revegetation areas) and display signs of improvement within 5 years of the commencement of improvement works.

5.2.2 Completion criteria

Completion criteria for the offset site are as follows:

- WONS reduced to less than 10% of baseline levels.
- Offset zones reach the habitat quality scores identified in the Amended Offsets Strategy (Appendix A):
    - Remnant areas improve from a habitat quality score of 7/10 to 8/10

- Rehabilitation and revegetation areas improve from a habitat quality score of 6/10 to 8/10
- Koala habitat quality will be assessed using the modified habitat quality assessment method detailed in the Amended Offsets Strategy. Any alternate methodology would require prior agreement between Boral and DoEE.

- Dogs or evidence of dog presence are not detected on the offset area for a period of three years.
- Koala habitat quality remains at target values or better for two consecutive five year monitoring events.

5.2.3 Corrective actions

If progression towards the completion criteria identified above are not met following annual compliance inspections and five (5) yearly habitat quality monitoring, the following corrective actions will be implemented:

- If pest animals are detected, the control measures and the timing and frequency of management measures will be increased and maintained at a higher rate of control until the completion criteria have been attained.
- Where unplanned fires or flooding occurs during the monitoring interval, any negative impacts to ecological score will be noted and compared to unaffected monitoring sites of previously the same quality and resulting potential weed infestations following disturbance will be managed to ensure the weed control completion criteria are achieved.
- If habitat quality scores are not showing improvement, at year 5, rehabilitation techniques will be reviewed by an independent, suitably qualified ecological consultant and alternate techniques recommended and implemented.
- Where koala habitat rehabilitation has a success rate below 90% at year 5, the active regeneration measures will be repeated once. If the success rate remains below 90% techniques will be reviewed by an independent, suitably qualified ecological consultant and alternate techniques recommended and implemented in consultation with DoEE.

5.3. Adaptive management

An adaptive implementation program will be used to ensure uncertainty is reduced over time, and that completion criteria are attained and maintained over the period of approval. As more information becomes available following ongoing performance monitoring, the management and monitoring regime will be reviewed and revised to maximise the likelihood of attaining and maintaining the outcomes to be achieved by implementing the OMP. Any updates to the OMP which do not result in a material change to the environmental outcomes, performance and completion criteria will be made by **Boral** without the requirement of informing the DoEE. If material amendments likely to alter the environmental outcomes, or performance and completion criteria are proposed to the OMP, the amendments and justification for the contingency measures will be provided to the DoEE in writing.

Adaptive management will be used to incorporate changes in any of the following areas:

1. Assimilation of new data or information - such as, updates to conservation advice or new threat abatement plans relevant to the koala.
2. Project coordination and scheduling – to manage unforeseen disruptions to schedule such as inclement weather on contractor works for management actions and environmental consultant monitoring events.
3. Annual review of risks – to refresh the mitigation measures should new threats be identified or stochastic events such as unplanned fires or floods occur.
4. Annual review of management measure effectiveness – to increase the frequency or change the method of management actions where monitoring performance criteria are not met.
5. Contingency for unplanned incidents – such as stochastic events including unplanned fires or floods.

5.4. Annual compliance reporting

In accordance with EPBC Approval (EPBC 2014/7251), an annual compliance report will be prepared and published on the **Boral** website following the commencement of the Action. The report will address the compliance with each of the conditions of approval, including any incident reports of undesirable impacts upon koalas (including Koala habitat), and any monitoring and management milestones achieved during the previous 12 months, including progress on key management measures, attainment of performance targets and completion criteria, and adaptive implementation outcomes. The compliance report will also address the effectiveness of the management measures and how the site is progressing against performance and completion criteria. Compliance reports will be produced annually for the life of the approval. Once completion criteria are achieved monitoring will be carried out at five year intervals for the life of the approval to ensure habitat values remain at the level specified in the completion criteria.

Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of the approval will be provided to DoEE at the time of publishing the compliance report.

6. Appendices

Appendix A: Environmental Offsets Strategy

Appendix A

Environmental Offsets Strategy