



Addendum to Plan of Management 2016 RevB

August 2016

**Recreation Camp for Eco Tourism
60-70 Bournemouth Street, Bundeena**

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Version / Date:8-8-2016 Rev B

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Document Status

Version	Purpose of Document	Orig	Review	Review Date
Rev A	Initial draft	Ron van Ardenne	Daintry	07/08/2016
Rev B	Update	Ron van Ardenne	Jarvis	08/08/2016

Approval for Issue

Name	Date
Ron van Ardenne	RVA Australia PTY LTD

Contents

18.0 LIGHTING POLICY 3

19.0 ECOLOGICAL IMPACT MITIGATIONS MEASURES..... 4



18.0 Lighting policy

The Recreation Camp SEE proposes to use only low powered led lighting.

This lighting policy requires:

- ✓ Outdoor path lighting is to be low powered led directed onto the walking surfaces from a maximum elevation of 50 cm above the surface and shielded towards the outside of the paths and north side of the land.

- ✓ Outdoor deck lighting is to be low powered led illuminating the deck area from within the roof line and shielded towards the outside of the deck and north side of the land.

- ✓ There will be no high powered flood lights.



19.0 Ecological impact mitigations measures

The following ecological impact mitigation measures will be adopted as recommended in Flora and Fauna Assessment RPS 2014 Table 7 Proposed mitigation measures:

Activity: Soil disturbance related to site establishment and bulk earthworks

Impact: Sedimentation and erosion leading to a reduction in water quality and degradation of aquatic habitat in streams, floodplains and wetlands.

Mitigation Measures:

- ✓ Appropriate sediment and erosion controls will be installed prior to the commencement of earthworks and construction, around the APZ and development footprint, to reduce run-off into adjoining vegetation and downstream to the Coastal Freshwater Wetland.
- ✓ Where possible, earthworks will be undertaken during dry weather conditions. Clearing of vegetation should be avoided during overland flow events.
- ✓ The limits of clearing for the APZ will be clearly marked on plans so that clearing activities are constrained to approved areas only.
- ✓ Soil or mulch stockpiles will be located away from key stormwater flow paths to limit potential transport of these substances into the Coastal Freshwater Wetland.
- ✓ Stabilisation of disturbed areas will be undertaken as soon as practicable after disturbance in accordance with approved methods as detailed in Managing Urban Stormwater: Soils and Construction 4th Ed. „The Blue Book“, NSW Government, (Landcom 2004).

Impact: Loss and degradation of native vegetation

Mitigation Measures:

- ✓ Clearance of native vegetation will be minimised as far as is practicable.
- ✓ Any additional construction areas, such as site offices, construction stockpile locations and machinery/equipment lay down will be located, where possible, within existing cleared or disturbed areas. No additional construction areas will be located within “No Go Areas” to be retained.

Impact: Loss of threatened flora species.

Mitigation Measures:

- ✓ Site inductions for construction staff will include a briefing on the potential presence of threatened species and their habitat adjacent to the development footprint, their significance and locations and extents of no-go zones.

Activity: Vegetation clearance

Impact: Loss of fauna habitat.

Mitigation Measures:

- ✓ Fencing with “No Go Area” signage will be installed to clearly define the limits of the works as to not further encroach on habitat to be retained.
- ✓ Species selection for any future landscaping works within the study area should be limited to locally occurring species that offer habitat to locally occurring fauna species

- ✓ All plants to be used in landscaping works should be of local provenance; local provenance seeds and plants are often better adapted to local environmental conditions and have a greater capacity to provide habitat, food and other resources for local wildlife.

Impact: Fauna injury/mortality.

Mitigation Measures:

- ✓ Prior to clearing, nearby habitat suitable for the release of fauna that may be encountered during the pre-clearing process or habitat removal will be identified by the ecologist.
- ✓ Pre-clearance surveys will be undertaken to identify any breed or nesting activities by native fauna within vegetated areas to be cleared. No breeding attempts or active nests should be disrupted, as far as practical.
- ✓ Where fauna species are identified in vegetation to be cleared, animals will be removed and relocated to adjacent bushland/nest boxes prior to felling. If this is not possible, the tree will be sectionally dismantled or soft felled under the supervision of an ecologist or wildlife carer, before relocating the animal.
- ✓ Prior to clearing, all hollow-bearing trees will be marked by an ecologist so that they are retained and avoided by contractors. Their location will be recorded using a GPS.
- ✓ A pre-start-up check for sheltering native fauna of all infrastructure, plant and equipment and/or during relocation of stored construction materials will be undertaken.
- ✓ Site inductions will include a briefing regarding the local fauna of the site and identification of protocols to be undertaken if fauna are encountered.
- ✓ If any pits/trenches are to remain open overnight, they will be securely covered, if possible. Alternatively, fauna ramps (logs or wooden planks) will be installed to provide an escape for trapped fauna.

Impact: Weed establishment and spread.

Mitigation Measures:

- ✓ Vehicles, equipment, materials and footwear are to be clean on entry (free of soil, mud and/or seeds) to minimise the introduction or spread of *Phytophthora cinnamomi*.
- ✓ Equipment used for treating weed infestation will be cleaned prior to undertaking work in the study area to minimise the likelihood of transferring any exotic plant material and soil.
- ✓ Soil stripped and stockpiled from areas containing known weed infestations will be stored separately and is not to be moved to areas free of weeds.
- ✓ Monthly inspection of the proposal will be undertaken upon the completion of work, to identify the establishment of any weed species. Any weeds identified will be removed.

Activity: Vegetation clearing, construction, clearing for APZ

Impact: Altered hydrological regimes related to an increase in impervious surface such as changes in runoff and infiltration, redirection of flows.

Mitigation Measures:

- ✓ Temporary mitigation measures for soil and water management control during construction will include, but will not limited to the following: sediment fencing, diversion drains, geotextile fabric.
- ✓ Stabilisation of disturbed areas will be undertaken as soon as practicable after disturbance.

Activity: Hot works (including vegetation clearing requiring heat producing equipment)

Impact: Outbreak of bushfire.

Mitigation Measures:

- ✓ Hot work will not be undertaken on declared total fire ban days.
- ✓ Vehicles and plant will not block access tracks.
- ✓ Bushfire awareness will be included in staff induction and in toolbox talks pre-commencement.

The following ecological impact mitigation measures will be adopted as recommended in Soil and Land Management Advice:

Activity: Vegetation management IPA and FRA

Impact: erosion of loose soil by wind and water

Mitigation Measures:

- ✓ From water erosion perspective trees do little to stabilise soils. Ground cover is crucial to mitigate against sheet and wind erosion. The proposal will actively manage and improve the ground cover vegetation.
- ✓ Mowing of groundcover by hand to increase groundcover over the current state by encouraging plant branching and small plant growth and to increase surface roughness and mitigation of proliferation of bracken.
- ✓ Thinning tree cover to promote ground cover growth by having less competition for water and light.
- ✓ Mowing and raking activities by trained operators capable to achieve targeted groundcovers under close supervision of caretakers.
- ✓ Establish and maintain monitoring regime with photographic records of ground covers.
- ✓ In wetter periods use brush matting in from of slashed material to encourage endemic native seedlings. Apply in small consecutive batches arranged along the contours in series of non-overlapping patches.
- ✓ Mowing and raking to be arranged along the contours in series of non-overlapping patches.
- ✓ Control of foot and vehicle traffic through the use of fences and signs.
- ✓ Irrigation with treated greywater through sprinkler based delivery system in small and frequent applications.

Activity: Introduction of walking driving and roof surfaces

Impact: erosion by concentrated water flows

Mitigation Measures:

- ✓ Proposed designs of driveway and building and tent structures ensure that all incoming water, including stormwater and other run off, is diverted either into storage tanks or soak trenches eliminating concentrated water flow risks.
- ✓ All overflows will have broad and level sills.

- ✓ Walking tracks are permeable raised path of gravel and or permeable pavers. Permeable pavers or level stepping stone boxes or similar lined with geotextile fabric filled with gravel on slopes greater than 10 percent. Retaining walls in paths of aluminium Knotwood.
- ✓ Driving surfaces are permeable bonded gravel with appropriately designed soak trenches for excess storm water

Activity: Introduction of composting toilets

Impact: spillages

Mitigation Measures:

- ✓ Composting systems to be installed on concrete aprons with emergency bunds to contain any spillages.

Activity: cleaning, showers and washing

Impact: Phosphorus influences native plants and can cause long term weed issues.

Mitigation Measures:

- ✓ All soaps and water additives will be as low in phosphorus as possible. Long term application of high SAR (sodium absorption ratio) cleaning products will be avoided. (see Appendix 3.6 Soil and Land Management Advice to the statement of environmental effects for DA 14/1238)
- ✓ The Recreation Camp will supply personal care and washing products that are known to be low Nitrogen, Phosphorus, Potassium, Sodium and Sulphur products.
- ✓ Guest will be discouraged from bringing their own products to ensure that grey water quality can be assured.