

## 10. COMPILATION OF MITIGATION MEASURES

### 10.1 Construction Environmental Management Plan

A construction environment management plan (CEMP) or equivalent will be prepared for the proposed works. The CEMP will be prepared in accordance with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004). Figure 4.1 of the guideline outlines information to be included in a CEMP including:

- Users of the EMP document (background, environmental management, implementation and monitor and review)
- Background (introduction, project description, EMP context, EMP objectives and environmental policy)
- Environmental Management (environmental management structure and responsibility, approval and licensing requirements, reporting, environmental training and emergency contacts and response)
- Implementation (risk assessment, environmental management activities and controls, environmental management plans or maps and environmental schedules)
- Monitor and Review (environmental monitoring, environmental auditing, correction action and EMP review).

The CEMP or equivalent will include any licences and permits that may be required, environmental management measures outlined in Section 6 of this EIS and additional site-specific measures that may be required as part of establishing the construction site or construction methodology.

An Operational Management Plan and Infrastructure Management Plan will also be prepared as part of detailed design in consultation with relevant stakeholders.

### 10.2 Traffic and Transport

- Construction will occur during recommended standard and out of hours periods for construction
- Construction vehicles will park on the construction compound shown in Appendix 6 of the Response to Submissions
- A Construction and Pedestrian Traffic Management Plan (CPTMP) will be prepared in consultation with Roads and Maritime Services and Newcastle City Council, prior to the commencement of works on site
- RMS have the right to review the CPTMP and can make changes in the interest of road safety and network efficiency
- All works associated with the project shall be at the cost to the developer, with no cost to RMS
- Bus services, pedestrian and bicycle rider movements be maintained at all times during the construction, particularly during university peak times.

### 10.3 Soils, Geology and Contamination

- Comply with requirements of "Report on Geotechnical Investigation" (Cardno, 2017 [version 1])
- Comply with requirements of "Preliminary Site Investigation (Cardno, 2017 [version 1]), including an unexpected finds protocol
- Any soil proposed to be excavated and transported off site for disposal should be classified in accordance with the NSW EPA Waste Classification Guidelines
- Validation soil sampling will be required once the soil excavation is complete to ensure that the residual soils are suitable for the ongoing land use

- Erosion and sediment control will be in accordance with *Managing Urban Stormwater: Soils and Construction* “The Blue Book”, Landcom (2004) and the plan in Appendix 3 of the Response to Submissions (September 2018).

## 10.4 Water Quality and Flooding

- Erosion and sediment control will be in accordance with *Managing Urban Stormwater: Soils and Construction* “The Blue Book”, Landcom (2004) and the plan in Appendix 3 of the Response to Submissions (September 2018)
- Stormwater management will be in accordance with Concept Stormwater Management Plan prepared by Northop (Appendix 18) as amended in detail design
- Dust suppression will be used during construction and may include water trucks
- All stockpiles will be covered to minimise potential generation of dust
- Oils, fuels and chemicals will be stored in a locked bund capable of holding 110% of the capacity of the containers within
- Equipment will be serviced and maintained to minimise potential for loss of fluids
- The construction compound and stockpile area(s) will be in an existing cleared area on the project site
- Sustainability and design principles identified in Section 6.16 will form part of the overall design philosophy for the proposed building

## 10.5 Air quality

### Construction Phase

- Limit dust-generating activities during periods of dry and windy weather
- Stage the work where practical in order to minimise the extent of disturbed areas
- Apply water as necessary to control and manage dust at the site of exposed surfaces
- Reduce speed limits along the access route until works are completed.
- Maintain vehicles and machinery to minimise emissions.
- Where wind causes off site emission of soil consider ceasing work for a short time or put dust control measures put in place.

### Operational Phase

- Engage a waste contractor to manage waste from the facility
- Maintain landscaping to minimise exposed soil
- The autoclaving “cycle” will not be conducted in the early morning during winter periods
- Wastes will be covered all waste management practices and protocols will be followed.

## 10.6 Noise

- Toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to surrounding receivers
- Training (of employees to conduct quieter work practices)
- Equipment which is used intermittently is to be shut down when not in use
- Undertake noise intensive construction or demolition activities outside of University hours, or in University holiday periods

- Where work is undertaken outside of school hours, noise mitigation options should be thoroughly investigated by the contractor prior to these works and validated by attended noise monitoring
- Where possible, machinery will be located/orientated to direct noise away from the closest sensitive class rooms
- Undertake regular maintenance of machinery to minimise noise emissions. Maintenance will be confined to standard daytime construction hours and where possible, away from noise sensitive receivers
- The quietest suitable machinery reasonably available will be selected for each work activity
- The offset distance between noisy items of plant/machinery and nearby sensitive receivers and classrooms will be maximised
- Queuing of vehicles is not to occur adjacent to any occupied classroom
- Where queuing is required, for example due to safety reasons, engines are to be switched off to reduce their overall noise impacts on receivers
- Where practicable, ensure those noisy plant/machinery are not working simultaneously in close proximity to classrooms
- Where possible, all plant are to utilise a broad band reverse alarm in lieu of the traditional hifrequency type reverse alarm
- Minimising the need for reversing or movement alarms
- Conduct noise monitoring throughout the proposal work
- Vibrating plant selection takes into account relevant offset distances to receivers to achieve both the human comfort and structural damage criteria
- For particularly sensitive educational receivers, it is recommended that vibration monitoring should be considered so that vibration levels from the project can be quantified and proactively managed against relevant structural criteria
- Construction will occur during recommended standard and out of hours periods for construction. Note, although are not mandatory, strong justification is required to work outside of normal construction hours. Notwithstanding, construction works during non-standard hours may be required for this project to minimise impact on surrounding educational receivers.

Recommended Hours for Construction:

- Normal construction
- Monday to Friday - 7am to 6pm
- Saturdays - 8am to 1pm
- Sundays or Public Holidays - No construction

Out of Hours Period 1

- Monday to Friday - 6pm to 10pm
- Saturdays – 7am to 8am and 1pm to 10pm
- Sundays or Public Holidays - 8am to 6pm

Out of Hours Period 2

- Monday to Friday – 10pm to 7am
- Saturdays – 10pm to 8am
- Sundays or Public Holidays – 6pm to 7am

These recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

- It may be feasible to implement mobile noise screens (which can achieve noise reductions of up to 8dBA), optimise the positioning of plant and equipment to minimise line of site to receivers or substitute noisy equipment in order to reduce the noise impact at nearby receivers for these activities
- Where it is not feasible to implement noise controls, conducting particular construction activities during periods when neighbouring educational receivers are not occupied (ie university holidays) should be considered if justifiable
- Given the potential for the predicted noise exceedances, noise mitigation strategies should be implemented wherever feasible and practicable during standard works. Wherever possible, subject to feasibility and reasonability, the quietest plant and equipment should be utilised in combination with management measures in order to minimise noise impacts
- The primary objective of the noise and vibration management strategy is to minimise noise impacts on surrounding university faculty buildings and residential neighbours. The project manager may adopt the following hierarchical strategy to achieve this objective:
  - ensure that construction activities meet construction noise management levels within the allowable hours of operation as far as practicable
  - where noise levels are above relevant noise management levels, implement reasonable and feasible best practice noise controls to minimise noise emissions and/or exposure duration at affected receivers
  - where the use of best practice noise controls does not adequately address exceedance of noise management levels, adopt alternative measures to minimise impacts on the community.

## 10.7 Flora, Fauna and Bushfire

- Contribute \$20/m<sup>2</sup> to the Bush Regeneration Budget for the entirety of the approximately 450m<sup>2</sup> of native vegetation to be removed and / or disturbed for the development footprint and associated temporary construction impacts, i.e. a total of \$9,000. Priority area for the contribution for the Bush Regeneration Budget should be Landscape Management Implementation Plan Bushland Zone 9. This contribution should enable bush regeneration of the disturbed area using locally native species and targeted weed removal for a minimum of 2 years, in accordance with the Action Plan
- Install 15 nest boxes as compensatory habitat prior to any removal of vegetation on the site. A site assessment is required to determine suitable areas within The University of Newcastle campus to install the boxes. Nest boxes should be installed at a maximum density of 15 per hectare
- An experienced and qualified ecologist should be contracted supervise tree felling and to manage any displaced fauna on site during tree-felling of any tree with habitat features (see Table 1 Landscape Management Implementation Plan: Eco Logical, 2012)
- To prevent downstream effects upon listed wetlands and National Park lands within the locality, construction works will require the implementation of 'best-practice' erosion and sedimentation controls as detailed in the Blue Book to prevent indirect impacts upon surrounding vegetation
- To prevent the spread of Myrtle rust (*Puccinia psidii*) vehicles and equipment should be cleaned and disinfected prior to leaving site as per Department of Primary Industries Biosecurity Guidelines
- Retain mature Eucalypt species where they lie outside the construction footprint, this may be applicable to *Corymbia maculata* trees in the southern boundary
- Comply with the University of Newcastle Bushfire Alert System to assist with the Bushfire Response Plan
- Comply with the University of Newcastle Bushfire Risk Management Plan
- Landscaping will be maintained in accordance with principles of Appendix 5 of Planning for Bushfire Protection 2006
- Implementation of Tree Protection Measure & Tree Protection Zone Specification
- Tree Protection Measures must comply with Australian Standard 4970 – 2009 Protection of Trees on Development Sites

- Any works within a nominated Tree Protection Zones must comply with Australian Standard 4970 – 2009 Protection of Trees on Development Sites
- Tree work to be carried out by a qualified tree contractor in accordance to Australian Standard 4373 – 2007 and in accordance with the Code of Practice Amenity Tree Industry August 2007
- Refer to the Landscape Management Implementation Plan prepared by Anderson Environmental and Planning in relation to replanting requirements to compensate for tree removal
- Ensure habitat and /or ecological significance of trees has been taken into consideration before any tree identified as a habitat tree is removed
- The following asset protection zones are required:
  - 20 metres on the northern, western and southern elevations
  - 25 metres on the eastern elevation
- Water, electricity and gas are to comply with section 4.1.3 of Planning for Bushfire Protection 2006
- The existing evacuation and emergency plan for the university to be updated to into the bioresource facility and to be consistent with development.

## **10.8 Heritage**

- In the event of an item of Aboriginal heritage significance being uncovered during the construction phase (a 'chance find'), works will cease in the vicinity of the find and OEH is to be contacted immediately. Works will not recommence until an investigation has been completed by a suitably qualified persons in accordance with OEH guidelines
- If any Aboriginal objects are identified during earthworks, work must immediately cease in the area and the Office of Environment and Heritage (OEH) must be notified immediately
- If suspected human remains are identified during the works, works must immediately cease. The area must be secured and the NSW Police and OEH notified immediately
- It is recommended that contractors undertaking sub surface disturbance works associated with the proposed development review the attached Cultural Heritage Awareness document (Attachment B) prior to commencement of works
- The proponent may wish to consider having a clause added to the construction contract that protects the proponent from penalties, if work on site is ceased due to the discovery of Aboriginal objects
- Comply with recommendations of the Aboriginal Cultural Heritage Assessment.

## **10.9 Visual**

No additional measures are considered necessary.

## **10.10 Social**

- Ongoing security measures will be maintained
- Ongoing security patrols will occur to protect students, staff and visitors.

## **10.11 Economic**

No additional measures are considered necessary.

## **10.12 Waste Management**

- Prepare a Construction Waste Management Plan

- Prepare an Operational Management Plan based on best practice including waste diversion from landfill and recovery of waste streams
- Prepare a Response and Incident Plan
- Comply with requirements of "Report on Geotechnical Investigation" (Cardno, 2017 [version 1])
- Comply with requirements of "Preliminary Site Investigation (Cardno, 2017 [version 1]), including an unexpected finds protocol
- Any soil proposed to be excavated and transported off site for disposal should be classified in accordance with the NSW EPA Waste Classification Guidelines
- Validation soil sampling will be required once the soil excavation is complete to ensure that the residual soils are suitable for the ongoing land use. All waste generated by the proposal will be classified in accordance with the NSW Waste Classification Guidelines Part 1: Classifying Wastes (NSW EPA, 2014) prior to being removed from the site.

### **10.13 Chemical and Fuel Storage**

- Prepare a Response and Incident Plan
- Oils, fuels and chemicals will be stored in a locked bund capable of holding 110% of the capacity of the containers within
- Oils, fuels and chemicals will be stored in accordance with manufacturers requirements and relevant Australian Standard
- A spill kit will be located at each chemical and fuel storage location appropriate to the volume and nature of the material
- Material Safety Data Sheet will be kept on site for all oils, fuels and chemicals stored.