

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

- New signalled intersection at Meadowie Road and South Street
- Single entry and exit points
- On site car parking designed in accordance with AS 2890 and Council's DCP requirements
- The layout of the access points and internal roads shall be designed to allow for two way traffic movements in accordance with AS 2890
- Incorporate access for ambulance and fire service vehicles to all sports fields and parking areas
- Bus zones to accommodate up to 5 spaces for loading, as well as a minimum of 7 spaces for buses to hold along the internal road (slip lane)
- Buses to only access site from the south, buses from the north to use roundabout at Richardson Road one kilometre to the south to access site.
- Prepare Construction Traffic Management Plan
- Construction will occur during recommended standard and out of hours periods for construction.

10.3 Soils, Geology and Contamination

- Construction will comply with requirements of the Geotechnical Investigation, Valley Civilab, November 2017 including excavation and batters, retaining walls and subgrade preparation and Contamination Assessment, RCA Australia, March 2018
- The Remedial Action Plan outlines how the contaminated material within the fill mounds currently situated on the northern and western side of the bitumen go-kart track will be managed
- Preparation, depending on the intended depth of excavations, of an ASSMP

- Erosion and sediment control will be in accordance with a erosion and sediment control plan in accordance with the Managing Urban Stormwater: Soils and Construction, 4th Edition, Vol. 1, (the “Blue Book”), Landcom, 2004
- All waste generated by the proposal will be classified in accordance with the NSW Waste Classification Guidelines Part 1: Classifying Wastes (EPA 2014) prior to being removed from the site
- Management of acid sulfate soils through an ASSMP.

10.4 Water Quality and Flooding

- Erosion and sediment control will be in accordance with a staged erosion and sediment control plan in accordance with the Managing Urban Stormwater: Soils and Construction, 4th Edition, Vol. 1 (the “Blue Book”), Landcom, 2004.
- Stormwater management will be in accordance with Stormwater Management Plan prepared by MPC Engineering (Appendix 15)
- Stormwater generated from roof, hardstand and landscaped areas associated with the college and ancillary areas (e.g. carparks, etc.) is to be detained and treated on-site such that any discharge to the SEPP 14 wetland and associated retained native vegetation west of the subject land is not of substantially different volume relative to the pre-development regime.
- Stormwater infrastructure for the college has been designed to incorporate a mix of Atlantis infiltration tanks and bio filtration detention ponds, gross pollutant traps (GPTs) and pollutant pit inserts (in carpark areas). As such stormwater quality for the existing site will not be compromised by the proposed development. Water quality exiting the subject land will comply with the requirements of the Protection of the Environment Operations Act 1997 and Port Stephens Council DCP.
- 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 the bund
- A response kit will be on site during construction to manage any accidental spills
- 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
- A water access licence will be required for the extraction of any of groundwater
- Acid sulfate soils will be managed through an ASSMP
- Flood Emergency Response Plan will be prepared for the site.
- Flood modelling was undertaken was the impacts of the proposed development are negligible in terms of affecting property, assets and infrastructure and therefore result in no detriment to the overall social or economic status of the community.

10.5 Air quality

Construction Phase

- Maintain vehicles and machinery to minimise emissions
- Limit dust-generating activities during periods of dry and windy weather
- Stage the work, where practicable, to minimise extent of disturbed areas
- Apply water as necessary to control and manage dust from exposed soil
- Stormwater management will be staged in accordance with construction staging
- Dust suppression will be used during construction and may include water trucks
- Reduce vehicle speeds along the access route until works are completed.

Operational Phase

- Maintain landscaping to minimise exposed soil
- Maintain plant and equipment.

10.6 Noise

- All neighbouring residents will be notified of the proposed works. Particular emphasis should be placed on the time frame of the works. A contact name and phone number of a responsible person should be given out so that complaints can be dealt with effectively and efficiently. All complaints or communication should be answered
- During the liaison process note will be made of any particularly noise sensitive times of day and care be taken to avoid scheduling noisy works at these times
- All personnel working on the job including contractors and their employees will be made aware of their obligations and responsibilities with regard to minimising noise emissions
- Contractors should familiarise themselves with methods of controlling noisy machines and alternative construction procedures. These are explained in AS 2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites"
- Activities that are known or have the potential to create excessive noise, where possible, will be scheduled to occur at times to cause least annoyance to the community. Carrying out such work during early morning will be avoided. This includes start up and idling etc. of heavy machinery prior to commencement of work
- Mechanical plant will be silenced using best available control technology. Noise suppression devices will be maintained to manufacturer's specifications. Internal combustion engines will be fitted with appropriate, well maintained, high efficiency mufflers
- Machines which are used intermittently will either be shut down in the intervening periods between work or throttled down to a minimum
- Alternatives to reverse alarms such as manually adjustable or ambient noise sensitive types ("smart" reversing alarms) will be considered. Alternative site management strategies can be developed, in accordance with a site OH&S Plan, with the concurrence of the appropriate OH&S Officer
- Any portable equipment with the potential to create high levels of noise e.g. compressors, generators etc. should only be selected for use if it incorporates effective noise control. This equipment will be located where practical so that natural ground barriers or site sheds etc. are between it and the nearest potentially affected receivers
- Where possible loading and unloading of plant and materials will be carried out away from potentially affected receivers
- All windows in the external facades of the TAS workshops will be minimum 6.38 mm laminated glass
- Windows to the TAS workshops will be closed whilst machinery is being operated
- Any siren or bell must be adjusted to have a maximum sound pressure level of 45 dB(A) Leq (5 sec) when measured at the boundary of the site and have a maximum duration of 5 seconds
- Air conditioner condensers will be mounted at ground level either a sufficient distance from the boundary and/or behind an effective acoustic barrier
- To avoid the possibility of structure borne noise due to vibrations, all duct work for HVAC venting must be isolated from the main structure of the building.

10.7 Flora, Fauna and Bushfire

Construction

- Prior to construction, a Construction Environmental Management Plan is to be developed which includes standard measures, including:
 - Installation of appropriate exclusion fencing to the boundary of the retained vegetation and any construction areas where there is some potential for accidental encroachment. This will include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'. Identification of any 'No Go Zones' in site inductions for all construction personnel.
 - All site perimeter is to be of a design that excludes terrestrial fauna, in particular Koala, so as to minimise the risk of Koala ingress to the construction site.
 - Internal fencing / barricades are to be used to establish tree protection zones (TPZs) around retained native trees in accordance with the Standards Australia Committee (2009).
 - All material stockpiles, vehicle parking and machinery storage should be located within the areas proposed for clearing, and not in areas of native vegetation that are to be retained.
 - Sedimentation and erosion control measures including silt fencing, sediment traps, etc. to prevent sediment-laden stormwater exiting the construction areas and to prevent scouring and erosion of land beyond the development footprint. All erosion and sediment control measures are to be constructed and installed in accordance with relevant guidelines, are to be regularly maintained for the duration of the construction period and are to be carefully removed at completion of works.
 - Sediment and erosion control measures should follow recommendations of The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004)
 - Dust suppression measures to ensure dust deposition beyond the construction area is minimised.
 - Weed and pathogen management including weed hygiene protocols for personnel, machinery and construction materials entering and exiting construction areas to minimise risk of weed and pathogen introduction and spread.
 - Waste management is to ensure food scraps and other organic waste that may attract introduced predators (e.g. fox, cats) or other pests (e.g. rats) is not stored for prolonged periods within the construction site.
 - Development of an Ecological Management Plan (EMP) for inclusion in the Construction Environmental Management Plan. The EMP will outline measures for staged vegetation clearing to manage fauna species during tree removal, including having a spotter / catcher present. Staged removal involves clearing of understorey vegetation and non-hollow-bearing trees in Stage 1, with removal of hollow-bearing trees in Stage 2. There should be a minimum of 24 to 48 hours between Stage 1 and Stage 2.
 - Ecologist pre-clearance surveys should include dusk stag watch for microbats with anabat, not greater than one week prior to felling of hollow-bearing trees on site. The project ecologist is to be present during hollow-bearing trees clearing to manage any microbats or other hollow-dependent fauna that may be present in hollows at time of clearing.
 - The EMP will detail procedures for dealing with trapped or injured wildlife during the construction period with particular focus on rescue and care of Koalas should an individual gain entrance to the construction site.
- Residual impacts to native vegetation will require retirement of 23 ecosystem credits and 6 Koala species credits in accordance with the Biodiversity Offsets Scheme
- A 10 metre VRZ is to be maintained along either side of the waterway traversing the southern section of the subject land from the top of both banks

- Road crossings are permitted within the 10 metre VRZ according to the riparian corridor matrix provided in Controlled activities on waterfront land - guidelines for riparian corridors on waterfront land (NSW Office of Water, 2012a). The proposed access road crossing is to be constructed with reference to the recommendations made in Controlled activities on waterfront land - guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012b) and the Policy and Guidelines for Fish Friendly Waterway Crossings (2003).
- Sediment and silt-screens are to be used to manage instream sedimentation and erosion during construction of the access roads over the unnamed stream in the south of the subject land. Sediment and erosion control measures should follow recommendations of The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004).
- As far as practicable, all construction activities are to undertaken during daylight hours to minimise noise impacts on fauna utilising adjacent habitats.
- Selection and retention of suitable logs (>10 centimetres diameter only) and hollows for placement within retained native vegetation adjoining the subject land.
- Where appropriate native vegetation cleared from the study area should be mulched for re-use on the site, to stabilise bare ground.
- Security lighting within the construction site is to be minimised and where required, is to be oriented such that light spill beyond the subject site and in to patches of retained vegetation is minimised.
- Consideration is to be given to the installation of nest boxes prior to commencement of vegetation clearing for construction. Installation of nest boxes prior to clearing will allow time for microbats and other hollow-dependent fauna to encounter these new resources prior to removal of existing hollows within trees to be removed.
- Establishment of APZs
 - The establishment of the IPZ surrounding the College will require the removal of non-native trees and shrubs and lopping of some branches of mature native trees in order to achieve the IPZ performance criteria outlined in Newcastle Bushfire Consulting (2018).
 - Establishment of the OPZ will require lopping of canopy branches of some mature native trees within the Swamp Sclerophyll Forest EEC and Hunter Lowland Red Gum forest EEC
 - As far as practicable, establishment of APZs will seek to remove trees not considered Koala feed trees in preference to Koala feed trees.
- A further 10m of understorey and ground cover to be managed as an outer protection zone to the west of the development. The bushfire consultant noted this is to be maintained in current state and will not require revegetated and as such will not affect the development.
- A staged fire trail has been proposed to maintain access to all areas of development during the varying construction stages – condition of consent
- Installation and provision of water, electricity and gas will comply with Sections 4.1.3 and 4.2.7 of *Planning for Bushfire Protection 2006*.
- An Evacuation and Emergency Management Plan will be prepared in compliance with Section 4.2.7 of *Planning for Bushfire Protection 2006*.
- Landscaping shall comply with principles of Appendix 5 of *Planning for Bushfire Protection 2006*
- New constructions shall comply with AS3959-2009 'Construction of buildings in bushfire-prone areas' or NAS standard and *Planning for Bushfire Protection 2006*.
- Water, electricity and gas are to comply with Section 4.2.7 of *Planning for Bushfire Protection 2006*
- A 10m revegetated buffer will be maintained along the riparian corridor of the watercourse that runs to the south of the development. This area will be managed via the averaging rule as described within Controlled activities on waterfront land – guidelines for riparian corridors on waterfront land prepared by the NSW Office of Water.

Operation

- Security lighting for the college is to be located and designed so as to minimise light spill to retained native vegetation and associated habitats beyond the subject land.
- Food waste (e.g. from canteen facilities, playground bins, etc) is to be managed to minimise the availability of this resource to introduced predators such as foxes and cats. Bins are to be of a design that restricts access by introduced pests including introduced predators.
- Regular monitoring and pest treatment of the college and ancillary facilities is to be undertaken to minimise build-up of introduced pest populations within the school boundaries and immediate adjoining areas.
- All perimeter fencing and some internal fencing (e.g. between retained canopy trees) is to be of a 'fauna-friendly' design which minimises potential impacts to gliding arboreal mammals (e.g. sugar gliders) if utilising retained trees within the subject land.
- Lapped and capped timber fencing (or similar) that is impermeable to Koala is to be installed north, west and south of the school to discourage movement of Koalas through the school grounds where they could become trapped. This will encourage Koalas moving east/west through the landscape to use retained habitat north and south of the development.
- Current vehicle speed limits along Medowie Road should be reviewed in consultation with Roads and Maritime Services. It is assumed normal school vehicle speed limit regimes of 40 km/h in the morning and afternoon peak school drop-off / pick-up hours will apply. Retention of the 40 km/h speed limit at all times of day in the vicinity of the college would benefit Koala and other mobile fauna species that occasionally cross Medowie Road and thereby increase the function of the link over cleared land identified in the Port Stephens CKPoM. The speed limit for all internal roads, including the permitter firetrail, is to be 40 kph or lower.
- Appropriate signage warning road users of fauna crossing along internal college access roads and approaches from Medowie Road are to be installed to minimise vehicle – wildlife interactions.
- Landscaping of the college is to use locally native species where practicable to limit the potential spread of weeds in to adjoining retained native vegetation and maximise the foraging resources available for highly mobile species. Where landscaping is undertaken outside the college perimeter fencing, Koala feed trees should be included in landscaping to compensate for loss of Koala feed trees at the locality.
- The presence of Koala and other threatened native fauna within the study area provides exceptional environmental education opportunities for the college which can help to raise awareness of biodiversity and lead to improved biodiversity conservation outcomes. Environmental education could incorporate simple surveys for Koala and other threatened fauna in adjoining bushland as part of the school science curriculum.
- A Vegetation Management Plan (VMP) is to be developed to guide the management of retained native vegetation within the College and adjoining APZs. The VMP will describe retention of native vegetation (where appropriate and in accordance with APZ objectives) and the management of weeds, rubbish etc. within APZs, at the boundary between APZs and adjoining native vegetation beyond the subject land and at points of discharge of stormwater infrastructure. The VMP will prescribe measures to minimise fertiliser and herbicide use in situations where chemicals could be transported beyond the subject land.
- A 10 metre VRZ is to be maintained along either side of the waterway traversing the southern section of the subject land from the top of both banks. Wherever possible works within the VRZ should be avoided and the VRZ protected.
- A 10m revegetated buffer will be maintained along the riparian corridor of the watercourse that runs to the south of the development. This area will be managed via the averaging rule as described within Controlled activities on waterfront land – guidelines for riparian corridors on waterfront land prepared by the NSW Office of Water.

10.8 Bushfire

- The proposed building works shall comply with BAL-12.5 in accordance with AS 3959-2009 Building in Bushfire Prone Areas and the construction requirements of *Planning for Bushfire Protection 2006* Appendix 3 (amended May 2010)
- At the commencement of building works and in perpetuity a minimum 50 metre asset protection zone shall be managed as an inner protection area (IPA) as outlined within Section 4.1.3 and Appendix 5 of *Planning for Bush Fire Protection 2006* and the NSW Rural Fire Service's document Standards for asset protection zones. The asset protection zone shall be divided into the below components:
 - a. Inner Protection Area – 40 metres
 - b. Outer Protection Area – 10 metres
- Installation of water, electricity and gas are to comply with section 4.2.7 of *Planning for Bush Fire Protection 2006*
- The property access is to comply with section 4.2.7 of *Planning for Bush Fire Protection 2006*
- Landscaping is to be undertaken in accordance with Appendix 5 of *Planning for Bushfire Protection 2006* and managed and maintained in perpetuity
- An Emergency /Evacuation Plan is to be prepared consistent with AS 3745 'Emergency control organisation and procedures for buildings, structures and workplaces' and consider bushfire.
- A further 10m of understorey and ground cover to be managed as an outer protection zone to the west of the development. The bushfire consultant noted this is to be maintained in current state and will not require revegetated and as such will not affect the development.
- A staged fire trail has been proposed to maintain access to all areas of development during the varying construction stages – condition of consent

10.9 Heritage

- All Aboriginal objects and Places are protected under the NSW National Parks and Wildlife Act 1974. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage (OEH). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders
- Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:
 1. Immediately cease all work at that location and not further move or disturb the remains
 2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
 3. Not recommence work at that location unless authorised in writing by OEH.
- No construction work will commence until outcome of the Aboriginal cultural heritage assessment is known.
- Comply with recommendations of the Aboriginal Cultural Heritage Assessment.

10.10 Visual

- Car parking has been modified to allow for more landscaping at the front of the proposed development.
- LED signage not supported by RMS

10.11 Social

- Lighting should help maintain sightlines and illuminate potential concealment areas. Outside of business hours, motion activated lighting is appropriate around the car park and school ground entrances
- External lighting is to be directed toward approaches to buildings rather than illuminating observers or vantage points (windows and doors)
- Vehicle entry points should be adequately signposted to enhance way finding and prevent unauthorised access to any restricted areas of site.
- Signposting is required to enhance way finding and prevent unauthorised access to any restricted area of the site
- All internal and external signage and directions around school grounds should be built / installed in accordance with the Australian standards (AS1428)
- Internal access points into buildings such as doors and windows should be lockable, preferably by key or magnetic system to maintain access control both inside and outside of operating time
- Consideration should be given to the use of an access control measure in the car park entrance to limit after hour access
- Pathways, landscaping, edge treatments, fencing and gates should provide clear indicators of appropriate access or restrictions of movement throughout the site
- Boundary fencing should clearly delineate public and private spaces and restrict access where necessary. It is considered that rear and side boundaries should be appropriately fenced using palisade or wire mesh style fencing. Front boundaries can be defined through the use of fencing, landscape treatments, or a combination of both. Front fencing will largely depend on the security needs of the school
- Signage / line marking within the car parking area should clearly define visitor and staff parking, bus waiting and service areas
- Ensure timely repair of damaged property and lighting, and 'rapid removal' approach to graffiti
- The use of organised security (i.e. alarms, 'back to base' alerts and security patrols) is recommended for outside of normal operating hours when natural surveillance is limited
- Consideration should be given to the use of graffiti resistant materials and surface treatments
- Landscaping along boundaries including the street frontage should include a mixture of low growing shrubs and mature / canopy trees (shape and size dependant on space available)
- Plants should be selected, sited and maintained where they will not reduce the effectiveness of lighting or interpretation of signage
- Landscape maintenance should promote natural surveillance by pruning low branches to approximately 2 metres high, and ground cover / hedges at around waist height
- Vegetation type and location should limit the ability for natural 'ladders' to promote access to upper building levels or to scale fencing.

10.12 Economic

No additional measures are considered necessary.

10.13 Waste Management

- A Waste Management Plan for construction waste will be developed by construction contractor
- A private contractor or Council will be engaged to manage ongoing waste collection from the site
- Determine volumes and nature of material to be removed from site, including potential for recycling

- Additional investigation for contamination will also occur following demolition of site structures in order to confirm remediation and waste disposal requirements
- Erosion and sediment control will be in accordance with a staged erosion and sediment control plan in accordance with the Managing Urban Stormwater: Soils and Construction, 4th Edition, “the Blue Book”, Landcom, 2004
- 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
- Prior to demolition a hazardous materials report will be prepared to determine potential hazardous materials in existing buildings and methods for their disposal.
- All food waste (e.g. from canteen facilities, playground bins, etc) will be managed to minimise the availability of this resource to introduced predators such as foxes, cats and birds. Bins are to be of a design that restricts access by introduced pests including introduced predators.

10.14 Chemical and Fuel Storage

- A Response and Incident Plan will be prepared
- Oils, fuels and chemicals will be stored in a locked bund capable of holding 110% of the capacity of the containers within the bund
- 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.