ENVIRONMENTAL IMPACT STATEMENT

PROPOSED REDEVELOPMENT OF HUNTER SPORTS HIGH SCHOOL
2 PACIFIC HIGHWAY, GATESHEAD

Prepared on behalf of:
NSW DEPARTMENT OF EDUCATION

Prepared by:

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DECLARATION

Environmental Impact Statement (EIS) – Proposed Redevelopment of Hunter Sports High School

Prepared under Part 4 of the *Environmental Planning and Assessment Act 1979*

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Address of the land on which the project is to be carried out
Lot 540 DP 755233, known as 2 Pacific Highway, Gateshead, Lot 1410 DP 755233 and Lot 92 DP 119213.

Proposed project Proposed Redevelopment of Hunter Sports High School

Certification I certify that I have prepared the contents of this environmental impact statement and to the best of my knowledge:

- the document has been prepared in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* and Schedule 2 of the Environmental Planning and Assessment Regulation 2000;
- the contents of the environmental impact statement have been prepared in accordance with the NSW Department of Planning & Environment Secretary's Environmental Assessment Requirements;
- the document contains all available information that is relevant to the environmental assessment of the activity to which the document relates; and
- The information contained in the document is neither false nor misleading.

Signature

Name Mark Maund
(for de Witt Consulting)

Date 2 August2016

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Prepared by:	**Reviewed by:**	**Released by:**
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EXECUTIVE SUMMARY

This Environmental Impact Statement (EIS) has been prepared for NSW Department of Education to accompany a Development Application (DA) for redevelopment of the Hunter Sports High School. The majority of the high school is located within Lot 540 DP 755233; however, the high school redevelopment also occupies a small section of Lot 1410 DP 755233 and Lot 92 DP 1192138 which is part of Wiripaang Public School. The site is on the Pacific Highway at Gateshead. The buildings currently house up to 850 students in a variety of educational setting that are nearing or have passed their economic life. Buildings at the school are aged and need replacement to provide state of the art facilities.

Construction will be staged over two years and teaching and student numbers are not expected to change as a result of the proposed development. School lessons start at 9.30am and finish at 3.10pm on a typical school day. However, students and staff are at school outside of these times for activities common to any school. The site is adjacent to Wiripaang Public School to the north with commercial buildings to the east. Playing fields and Johnsons Creek are located south and west of the site.

Project Summary

The proposed development includes new or upgrades to:

- Classrooms and other learning spaces
- Library
- Hall facilities
- Canteen area
- Administration and other staff facilities
- Driveways and other infrastructure to improve site access and separate pedestrian and vehicle movements
- Associated infrastructure and service
- External landscaping.

New buildings will consist of:

- Block S: a new Movement Complex (hall)
- Block T: 2 and 3 storey classroom and administration building containing general learning spaces, specialist learning spaces such as science labs, hospitality kitchens and wood/metal workshops, staff study and reception
- Block U: single storey block containing library, big picture learning academy, art, music and sporting change facilities

Secretary's Environmental Assessment Requirements were issued on 21 March 2016 and have been addressed in this EIS.

Traffic and Transport

A Traffic and Parking Impact Assessment and Supplementary Information consider the existing and proposed future situation. The school fronts the Pacific Highway that is a Roads and Maritime Service (RMS) classified State Road. There is also existing public transport in the area including buses to the school. The proposed redevelopment will include 70 parking spaces with additional kerbside parking. There are two existing bus bays on the Pacific Highway that can accommodate up to 4 buses simultaneously. One disabled parking space is also provided on site.

The new driveway will act as a left in/ left out access and internal carparks are for shuttle buses and staff parking. Emergency vehicles can access the school ground. The traffic assessment found parking is appropriate to the proposed development and access and egress to the site can occur safely.

Soils, Geology and Contamination

A Report on Geotechnical Investigation, Preliminary Site Investigation (Contamination) and Report on Targeted Site Investigation for Contamination summarise the existing situation and potential impact of the redevelopment. The site is not considered acid sulfate prone. The site has been contaminated by previous activities including presence of lead localised at one location, localised hydrocarbon in one location, benzo(a)pyrene and presence of building rubble including asbestos containing material in near surface filling and at the surface in several areas of the site.

A Remediation Action Plan has been prepared to provide for site remediation and management. The Remediation Action Plan defines the site as those areas of proposed development, including associated access, driveways and infrastructure, plus any ancillary areas to be disturbed as part of construction works. A number of remediation options were considered including no action, on site treatment, off site disposal and on site management (containment). On site management of contaminated soils is considered to be a feasible remediation option to protect human health and the environment and minimise constraints on the future use of the site. Off site management measures have also been proposed to address remediation.

Remediation goals were established with the main objective to place contaminated soils beneath a suitable capping layer of concrete slab / pavement (one designated building footprint) to prevent exposure and accessibility. Any excess material requiring off site disposal should be classified with reference to NSW EPA Waste Classification Guidelines (2014) and disposed to a licensed facility. Additionally, geofabric or alternate layer will be placed on top of contaminated fill materials as a warning / marker layer and to provide separation from overlying materials.

Remediation acceptance criteria are established and these will be deemed to have been attained when the capping has been successfully installed. With exception of localised asbestos, polycyclic aromatic hydrocarbons and total recoverable hydrocarbons contamination within the development area, the soil investigation results meet the adopted Remediation acceptance criteria. A suggested sequence of remediation is provided to outline the remediation methodology.

Excess soils excavated from within the site that cannot be accommodated beneath capping will require temporary stockpiling, sampling and analysis and appropriate off-site disposal by a licenced contractor. Upon the completion of capping, a suitably qualified environmental consultant should prepare a Remediation and Validation report that will be finalised following the completion of construction. A long term Site Management Plan is required at completion of construction for Department of Planning & Environment review and approval and in order for Lake Macquarie City Council to update the Section 149 certificate for the site.

Additional investigation is recommended to delineate the extent of impacted soils and confirm the suitability for on-site management of contaminated soils and aid the assessment and likely volumes. As asbestos material identified on the site was generally in the form of fragments or bundles of fibre cement sheet, there is a low risk of asbestos fibres becoming airborne. However, as a precaution air monitoring will be conducted by the occupational hygienist during remediation. Management measures regarding air monitoring will be included in the contractors CEMP (i.e. additional management measures, stop work etc). Additionally, a Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition to determine any additional controls required to ensure safety of students, staff and visitors.

Appropriate traffic management is required to control and track waste removed from the site and minimise potential for loss of contaminated soil and other waste from the site.

It is noted that fill materials are likely to be present across the school playing fields and it is recommended that these areas be included in ongoing long term site management as a precautionary measure. Staged erosion and sediment control will occur throughout construction to ameliorate potential impact to Johnsons Creek.

Water Quality and Flooding

The study area is located within the Jewells Swamp catchment and is drained by Johnsons Creek to the west, a second order stream. Jewells Swamp is a wetland listed by State Environmental Planning Policy (SEPP) 14 – Coastal Wetlands; therefore the study area is within the catchment of a SEPP 14 wetland. The total site area is approximately 91,055m^2. Stormwater management currently includes a below ground piped stormwater system that discharges to Johnsons Creek to the south west. The Biodiversity Assessment Report found that standard mitigation measures will address potential for indirect impacts on the wetland as part of the construction protocols and stormwater management structures implemented as part of the proposal.

The geotechnical report found free groundwater was observed in Bores 101 and 103 at depths of 1.2 metres and 2.9 metres respectively (approximately RL 26.1 m to 22.6 m AHD, respectively). A groundwater management plan will form part of the Construction Environment Management Plan.

The site is considered a flood control lot – low hazard (Appendix 15). Rainfall events up to a 100 year ARI cannot be accommodated by the below ground pipe network and will be conveyed on the surface via overland flow along the line of the below ground system. Piped flows will pass through the detention system prior to discharge. Bypass flows will travel over the surface and dissipate onto the playing fields to the south western part of the site adjacent to Johnsons Creek. As the post developed flows leaving the site will not exceed existing flows, and the 100 year flood extent is below the level of the site discharge point, it can be seen that the proposed development will have no adverse impact on flooding within or external to the site.

Water efficient devices are proposed in sanitary fixtures and tapware to reduce water usage. The hydraulic design for the redevelopment includes a comprehensive rainwater re-use system supplying non-potable water to the main amenity areas for toilet flushing and will also supply all new hose taps and irrigation systems to landscaped areas. The system includes two rain water tanks with a combined capacity of 75KL supplied by the existing Block M and northern most covered outdoor learning area (COLA) roof catchments, this system is additional to any local authority requirements and has been included to reduce the demand on potable drinking water supplies.

Air Quality

The school has operated at the site since 1959 and there have been no significant air quality incidents as a result of the school. Teacher and student numbers at the school will remain unchanged from current and as such the proposal will not generate additional traffic movements that may impact on air quality. The grounds are generally built on or landscaped with minimal potential for creation of dust.

Dust (airborne particulate matter) is identified as being the key air quality issue to be assessed. Emissions will be produced during the construction phase of the proposal. Appropriate dust control during construction will ameliorate potential off site dust emission. As asbestos material identified on the site was generally in the form of fragments or bundles of fibre cement sheet, there is a low risk of asbestos fibres becoming airborne. However, as a precaution air monitoring will be conducted by the occupational hygienist during remediation. Additionally, a Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition and determine any additional controls required to ensure safety of students, staff and visitors. Management measures regarding air monitoring will be included in the contractors CEMP (i.e. additional management measures, stop work etc).

Noise

An unattended noise survey was conducted to quantify the existing background noise environment. A Construction Noise and Vibration Management Plan has been prepared to quantify noise and vibration emissions from the project to surrounding receivers. Receivers in the locality surrounding the project site are primarily educational, residential and commercial. Existing or future classroom buildings have been assessed for each activity where relevant.

The Interim Construction Noise Guideline sets out procedures to identify and address impacts of construction noise on residences and other sensitive land uses. The noise assessment adopted a quantitative assessment approach including identification of potentially affected receivers, description of activities involved in the project, derivation of the construction noise criteria, quantification of potential noise impacts at receivers and management and mitigation recommendations.

The three construction periods that are considered are:

- Normal construction hours: Monday to Friday 7am to 6pm, Saturday 8am to 1pm , no work on Sundays or public holidays
- Out of hours construction 1: Monday to Friday 6pm to 10pm, Saturday 7am to 8am and 1pm to 10pm, Sunday or public holidays 8am to 6pm
- Out of hours construction 2: Monday to Friday 10pm to 7am, Saturday 10pm to 8am and Sunday or public holidays 6pm to 7am.

To minimise construction noise impacts on students and teachers, and to ensure continuity of studies, some activities may need to be completed during out of hours periods. Strong justification is required to work outside of normal construction hours. Activities proposed outside normal construction hours will be considered against the Construction Noise and Vibration Management Plan to ensure compliance. Schools or commercial receivers are unlikely to be occupied during the out of hours periods so only residential receivers are included in assessment of out of hours construction.

The road traffic noise criteria are provided in the NSW Environment Protection Authority's Road Noise Policy (Freeway/arterial/sub-arterial road categories were adopted for the Pacific Highway which is the primary transportation route of construction vehicles to the project).

Vehicle movements to the project will be from the south and exit to the north via the Pacific Highway. It is anticipated that the maximum workforce on the project will be up to 150 staff per day (i.e. 300 movements). The noise assessment assumed a conservative volume of up to 25 trucks per day (i.e. 50 movements) that will be required for waste removal and/or delivery of construction materials and demonstrates noise levels from construction traffic will remain below relevant day criteria for receivers at a distance of 15m from the roadway and also satisfy the relevant increase criteria.

Major potential sources of construction vibration include impact hammers during demolition of existing buildings. Equipment and plant have the potential to operate at a minimum offset distance of 10m from the nearest existing school classrooms when demolition work occurs. Generally, there is a low probability of adverse comment or disturbance to building occupants for hammering (medium hammer i.e. 900kg) for distances of up to 30 metres allowing for regular respite periods.

Daytime operational noise emission criteria for the project have been set in accordance with the Industrial Noise Policy. A hypothetical noise modelling assessment of mechanical plant noise found that at the nearest receiver (Wiripaang Public School) predicted noise levels from mechanical plant were less than 30dBA and hence satisfy relevant operational noise criteria for an educational receiver.

Noise levels during standard hours construction periods will satisfy relevant Noise Management Levels at all off site catchments. Notwithstanding, construction noise is predicted to impact existing onsite classrooms adjacent to construction/demolitions areas. External exceedances range from1dB to 24dB above relevant Noise Management Levels at several classrooms in close proximity to works, assuming the classrooms have a partially opened window. Construction noise levels are predicted to be above the highly noise affected criteria of 75dBA LAeq(15min) at Bock C during certain stages of construction and mobile noise screens (which can achieve noise reductions of up to 8dBA) and optimising positioning of plant and equipment can occur. Where it is not feasible to implement noise controls, conducting particular construction activities during out of hours periods may be considered. However, priority should be given to conducting work during out of hours period 1 (6pm to 10pm) and where possible, works between out of hours period 2 (10pm to 7am) should be avoided. A hierarchy of noise control strategies has been provided

Should compliance noise monitoring indicate exceedances of the noise criteria, a combination of comprehensive noise mitigation treatments (i.e. noise barriers, equipment enclosures, silencers, regular equipment maintenance, etc) and consultation with the local community will occur to manage exceedances. Where construction activities are completed outside of standard hours, reasonable and feasible noise controls will be implemented.

Flora and Fauna and Bushfire

The Biodiversity Assessment Report found the site is highly disturbed and modified. Small patches of highly modified native vegetation occur mainly in the south eastern corner of the study area, with much smaller remnants elsewhere. Remnant native elements are restricted to individual, robust shrub and herb species that occur sparsely. The remnant native vegetation in the south eastern corner connects with a band of remnant native vegetation alongside the oval to the south of the study area that runs alongside the Pacific Highway.

The proposed development will not impact on any state significant biodiversity links or regionally significant biodiversity links. The proposed development will result in minor losses of highly modified native vegetation and potential fauna habitat, with 0.13 hectares of vegetation across one Plant Community Type – Smooth-barked Apple – Red Bloodwood – Brown Stringybark – Hairpin Banksia heathy open forest of coastal lowlands to be permanently removed.

One threatened flora species was recorded within the subject site, Narrow-leaved Black Peppermint *Eucalyptus nicholii*. Being isolated, it is unlikely that the tree forms a part of any locally interbreeding population. From the habitat assessment the likelihood of occurrence of threatened fauna species within the subject site was determined. With very limited roosting, nesting or foraging opportunities for threatened fauna being found present it was determined that there was a low likelihood of occurrence for most threatened fauna species. The study area does not support important or critical habitat for any threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). The study area does not support the Critically Endangered Ecological Community Central Hunter Valley eucalypt forest and woodland.

Two ecosystem credits for Plant Community Type 1619 (HU833) - *Smooth-barked Apple – Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands* are required to offset the impacts on that vegetation type due to the proposed development. An expression of interest for the required credits was placed on the NSW Office of Environment and Heritage (OEH) 'Credits Wanted Register' on 23 May 2016. Should a period of six months elapse since the expression of interest was placed on the public register with no positive outcome and all other reasonable steps have been exhausted, then a variation of the offset rules will be applied in which credits can be sought from a Plant Community Type in the same vegetation formation as the Plant Community Type to which the required ecosystem credits relate.

In accordance with Planning for Bushfire Protection 2006 the predominant vegetation class has been determined for a distance of at least 140 metres out from the subject land. In accordance with Planning for Bushfire Protection, the subject land within the school can be classified as 'managed lands'. The acceptable solution Asset Protection Zone for a Special Fire Protection Purpose building is 70 metres to the west and south. The managed separation distances provided within the school grounds exceeds 70 metres. Additional Asset Protection Zone establishment or vegetation removal is therefore not required. There are no formal construction requirements under Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas.

Heritage

The site is not located in a heritage precinct and does contain a known non-Indigenous heritage item. A search of the Aboriginal Heritage Information Management System (AHIMS) found one Aboriginal heritage site recorded in or near the study area (50 metre buffer). OEH has advised that the Aboriginal heritage site (card number 38-4-0020) was recorded incorrectly and may be discounted. An assessment was carried out in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* and the assessment found there is unlikely to be potential impact to Aboriginal heritage during the construction or ongoing operation of the school.

Visual

The proposal is a contemporary redevelopment of the school and playground areas. The maximum permissible building height for the site is 8.5 metres and height of the proposed redevelopment is approximately 12.66 metres, however proposed building heights are in keeping with the nature of the school and surrounding development. Architectural and landscape plans present a modern design with materials appropriate to the site and proposed use of the school. Existing aged buildings will be replaced by new contemporary buildings and will provide a positive visual impact. The Graphical Representation prepared by the architect highlights the positive streetscape and internal changes to the school and buildings.

Social

There is ongoing need for quality education in Lake Macquarie and the Hunter generally. The proposal will result in positive social impacts through a redeveloped educational facility. The Crime Risk Assessment Report provides a number of measures to be implemented in the school including surveillance opportunities, landscaping treatments, maintenance and lighting.

Economic

A number of positive economic outcomes will occur as a result of the development such as a minimum number of 1 apprentice for every 4 tradespersons or 20 percent of the average number of tradespersons. The Contractor will also be required to comply with the NSW Government Policy on Aboriginal Participation in Construction. The proposal will result in a minor economic benefit with up to 150 construction jobs generated. The school is an integral part of the community and the redevelopment will ensure ongoing employment for staff and suppliers.

Waste Management

Douglas Partners prepared a Targeted Site Investigation for Contamination. The Remediation Action Plan addresses management of asbestos and contaminated material. Waste management will form part of the Contractors Environmental Management Plan and a Waste Management Plan will be prepared prior to construction activities commencing on site. A Hazardous Materials Report will be prepared prior to demolition to determine potential for hazardous materials in existing buildings. All waste generated by the proposal will be classified in accordance with the NSW Waste Classification Guidelines Part 1: Classifying Wastes and an approved Remediation Action Plan.

Chemical and Fuel Storage

A number of chemicals will be stored on site with a list of likely chemicals based on a stocktake at the school in 2015. Chemicals will be located in appropriate storage locations and bunds to minimise potential for accidental spillage.

Matters of National Environmental Significance

The Biodiversity Assessment Report found the study area does not support important or critical habitat for any threatened species listed under the EPBC Act. Referral under the EPBC Act is not required for the proposed development.

Conclusion and Justification

The development is consistent with the principles of ecologically sustainable development. There is unlikely to be significant impact on the environment as a result of the proposed development provided environmental mitigation measures are adopted. The proposal will not have a significant impact on the environment, including threatened species, populations or ecological communities, or their habitats. Approval is not required under the EPBC Act.

1. INTRODUCTION

1.1 Overview of Proposal

This Environmental Impact Statement (EIS) has been prepared for NSW Department of Education to accompany a Development Application (DA) for redevelopment of the Hunter Sports High School. The proposed redevelopment of Hunter Sports High School is development that requires consent pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development is considered *State Significant Development* in accordance with Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011.

Detailed architectural and staging plans are provided in this EIS to highlight proposed demolition of structures, the areas of redevelopment and ongoing use of the site for education. The EIS has been prepared to address matters referred to in Part 4 of the EP&A Act, matters required to be addressed as outlined in the *EP&A Regulation* and the Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) issued 21 March 2016 (Appendix 32).

The purpose of this EIS is to:

- Describe the land to which the proposal relates and the character of the surrounding area
- Describe the proposed activity
- Define the statutory framework within which the proposal is to be assessed and determined
- Determine environmental impacts of the proposed development
- Provide environmental mitigation measures to manage potential environmental impacts.

1.2 Site Location and Context

The majority of the high school is located within Lot 540 DP 755233; however, the high school redevelopment also occupies a small section of Lot 1410 DP 755233 and Lot 92 DP 1192138 which is part of Wiripaang Public School. The site is on the Pacific Highway at Gateshead which is approximately 13 kilometres south Newcastle.

Hunter Sports High School is the only designated sports high school north of Sydney. The proposed development will provide the school with state of the art facilities, including new classrooms, administration buildings, sports fields and training facilities.

The proposed works associated with the delivery of new or improved facilities includes:

- Classrooms and other learning spaces
- Library
- Hall
- Canteen
- Administration and other staff facilities
- Driveway
- External landscaping
- Associated infrastructure and services
- Demolition of substandard facilities.

1.3 Approvals Pathway

This EIS has been prepared for NSW Department of Education. The proposal includes demolition and redevelopment of most buildings on the school grounds. Section 89C(2) of the EP&A Act states State Significant Development may include development identified within a State Environmental Planning Policy.

Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011 identifies State Significant Development as follows:

> *"15 Educational establishments*
>
> *Development for the purpose of educational establishments (including associated research facilities) that has a capital investment value of more than $30 million."*

The capital investment value for the proposed development is $30,671,743 (Appendix 4) and as such is identified is State significant development under the SEPP.

1.4 Need for Proposal

NSW Department of Education wish to replace existing buildings and facilities at the site. The buildings currently house up to 850 students in a variety of educational setting that are nearing or have passed their economic life. Buildings at the school are aged and need replacement to provide state of the art facilities. The project has the following objectives:

- Provide a long term financially viable solution for ongoing operation of the school
- Comply with relevant codes (National Construction Code and Australian Standard)
- Erect buildings that provide contemporary educational facilities that meets community expectations
- Provide facilities that allow for modern delivery of education to students
- External car parking, driveway and access
- External landscaping and water features
- Associated infrastructure and services.

The proposed development will provide an improved environment for the long term education for residents of Lake Macquarie and broader population.

1.5 Alternatives Considered

As part of the development process various options have been considered with the aim of ensuring the current and future needs with respect education, building standards and ensuring a sustainable and appropriate outcome.

Four options considered were as follows.

1. Redevelopment of school
2. Alternative school location
3. Minor upgrades to existing buildings
4. Do not proceed.

Option 1 involves redevelopment of the existing school including demolishing most of the buildings and constructing new buildings. Option 1 has potential to impact on the environment in a number of ways including waste management, traffic, noise and disruption to current school operations. However, this option provides efficiencies in using existing infrastructure where practicable and minimising disruption to the school by developing in stages.

Option 2 involves constructing the school at a different location. Moving the school to another location would allow the current school to operate while the new school is being built. Option 2 may impact on the environment through potential tree clearing, additional materials for infrastructure, increased costs in purchasing another site and additional consideration of traffic movements to ensure adequate public transport options are available. Option 2 is not the preferred option due to potential environmental impact, additional costs and disruption to the school.

Option 3 involves ongoing operation of the school with minor upgrades to existing buildings. Many of the buildings at the school are beyond their economic life and require significant repair and upgrade. Additionally, some of the buildings contain asbestos. Option 3 is not the preferred option.

Option 4 involves not proceeding with the proposed redevelopment. Currently, the buildings at the school are beyond their economic and physical life. These buildings need to be replaced in order to provide an environment suitable to ensure education of students can occur. Not proceeding with the redevelopment will result in a facility that does not meet the ongoing needs of education for the community and would create unsustainable ongoing repair and maintenance issues.

Option 1 is preferred and is considered throughout this EIS as it would facilitate the redevelopment of the school and associated infrastructure, whilst enable the school to continue operations through the development process. The location of the school, growing demand for education services whilst maximising usage of existing significant infrastructure, transport routes and areas utilised for education purposed for over 40 years.

1.6 Structure of the EIS

- Section 2 presents a summary of the proposed development
- Section 3 presents the site, its attributes and location
- Section 4 presents the statutory context
- Section 5 outlines consultation with agencies and the community
- Section 6 provides an environmental assessment of the proposed development and likely impact on the environment
- Section 7 provides consideration of matters of national environmental significance
- Section 8 provides a list of approvals and licences that may be required
- Section 9 provides consideration of Clause 228 factors
- Section 10 provides a compilation of environmental management measures
- Section 11 provides a conclusion and justification for the proposed development
- Section 12 lists references.

2. THE PROPOSAL

2.1 Introduction

This EIS accompanies an application for the proposed State Significant Development (SSD). It has been prepared for NSW Department of Education and includes the matters referred to in Part 4 of the EP&A Act and the matters required to be addressed as outlined in the NSW Department of Planning & Environment Secretary's Environmental Assessment Requirements issued 21 March 2016 (Appendix 32). The proposed development will provide the school with state of the art facilities, including new classrooms, administration buildings, sports fields and training facilities to meet ongoing education needs of the community.

2.2 Existing Development

Hunter Sports High School is a partially selective high school that balances academic excellence with sporting achievement servicing the immediate area and afar. Located on the Pacific Highway in Gateshead, Hunter Sports High School has forged close ties with its community and offers local students and students selected to participate in the Talented Sports Program with a safe, caring and highly supportive environment in which to complete their secondary education.

Local students are drawn from Gateshead, Gateshead West, Windale and Mt Hutton while selected students come from as far as the Central Coast, Hunter Valley and the Port Stephens area, to take part in the widely recognised sports programs the school offers.

Buildings and facilities at the school include the following:

- Block A – Administration
- Block B – Canteen and class rooms
- Blocks C, D & E – Class rooms
- Block F – Workshops
- Block J – Science laboratories and Arts class rooms
- Block L – Library
- Physical Education Courts
- Covered Outdoor Learning Area.

The site contains a number of assets that have passed or are nearing the end of their life cycle and require significant upgrade or replacement. The various buildings and infrastructure on site are consistent with that on any school site of this nature, in that they vary in type, materials quality and age, are one, two and three storey buildings of brick, timber and other materials. There is existing signage located at the main entrance associated with school activities and general signage around the school associated with way finding and building notation.

2.3 Proposed Development

NSW Department of Education propose to replace existing buildings and facilities at the site. The buildings currently accommodate up to 850 students in a variety of educational settings that are nearing or have passed their economic life. The project has the following objectives:

- Provide a long term financially viable solution for ongoing operation of the school
- Comply with relevant codes (National Construction Code and Australian Standard)
- Erect buildings that provide contemporary educational facilities that meets community expectations
- Provide facilities that allow for modern delivery of education to students
- External car parking, driveway and access

- External landscaping and water features
- Associated infrastructure and services.

The proposed development provides for long term education for residents of Lake Macquarie and broader population. The subject DA relates to provision of new or upgrades to:

- Classrooms and other learning spaces
- Library
- Hall facilities
- Canteen area
- Administration and other staff facilities
- Driveways and other infrastructure
- External landscaping
- Associated infrastructure and service provision.

Development will occur in stages (refer to Section 2.4) and will comprise three main buildings as outlined below:

- Building Block S
    - Building functions: Movement Complex and Canteen
    - Building floor area / footprint: 1,220m^2
    - Number of storeys: 1
    - Building height (maximum): 9.855 metres.
- Building Block T
    - Building functions: Hospitality, Technological and Applied Studies, Science, General Learning Space, Administration, Senior Study Areas, Staff Study and Lounge, Staff Amenities and Student Amenities
    - Building footprint: 2,255m^2
    - Building floor area: 5,792m^2
    - Number of storeys: 3
    - Building height: (maximum): 12.660 metres.
- Building Block U
    - Building functions: Library, Creative and Performing Arts, General Learning Spaces, Big Picture Academy, Minimbah Room, Student Change Room and Amenities
    - Building footprint: 1,695m^2
    - Building floor area: 1,883m^2
    - Number of storeys: 1 and lower ground Change Rooms
    - Building height (maximum): 9.395 metres.

Existing buildings on the site to remain are as follows:

- Agricultural Shed
- Bus Shed
- Cricket Nets
- Covered outdoor learning area
- Covered ball courts

- Roof footprint area / 2,495m^2
- Roof height (maximum): 9.270 metres

- Block Q – Gymnasium
  - Building footprint / floor area: 1.955m^2
  - Number of storeys: 1
  - Building height (maximum): 10.650 metres.

The development includes the following development footprint:

- Site area of 91,055m^2 (not including Wiripaang School site)
- Total new building site footprint area of 5,170m^2 (Blocks S, T and U)
- Total new building floor area of 8,895m^2 (Blocks S, T and U).

2.4 Development Staging

The proposed development will be staged in accordance with the milestones presented in Table 2.1. Visual representation of the milestones is provided in the milestone drawings (Appendix 23).

Table 2.1 – Project Milestones

Milestone Number	Description
1	**Block S - Movement Complex** ➢ Construction of new driveway crossing off Pacific Highway and associated service road ➢ Preparatory works for new electrical and hydraulic services ➢ Construction of new Movement Complex (Block S) including supply and installation of furniture and equipment ➢ Provision of Operation and Maintenance Manuals and compliance certification.
2	**Move No.1** ➢ Assist in the move of staff and student materials from Block L and part of Blocks A and B into new Block S and other parts of the existing school ➢ Contractor is to provide boxes for packing by school staff. Contractor is to coordinate and manage the move process with the school.
3	**Demolition No.1** ➢ Demolish Block L and part of Blocks A and B and make good. Construct temporary stair to Block B.
4	**Block T** ➢ Construction of new 2 & 3 storey classroom and admin building (Block T), including supply and installation of all furniture & equipment ➢ Provision of Operation and Maintenance Manuals and compliance certification. Note: Works associated with the new pedestrian entry and works to the existing visitor carpark are to be scheduled within a school holiday period. Pedestrian and vehicular access in this area is to be maintained during school hours.

5	**Move No.2** ➢ Assist in the move of staff and student materials from Blocks A, B, C, E and F into new Block T and other parts of the school. Relocation of temporary staff room in Movement Complex to new staff room in Block T ➢ Contractor is to provide boxes for packing by school staff. Contractor is to coordinate and manage the move process with the school.
6	**Demolition No.2** ➢ Demolish remainder of Blocks A, B and demolish Blocks C, E and F.
7	**Block U** ➢ Construct new single storey classroom and library building (Block U), including supply and installation of all furniture and equipment ➢ Provision of Operation and Maintenance Manuals and compliance certification.
8	**Move No.3** ➢ Assist in the move of staff and student materials from Blocks D, J and H into new buildings. Relocate temporary library from Movement Complex to Block U ➢ Contractor is to provide boxes for packing by school staff. Contractor is to coordinate and manage the move process with the school.
9	**Demolition No.3** ➢ Demolish Blocks D, J (to slab level) and H.
10	**Tennis Court** ➢ Construction of tennis court to Block J slab ➢ Provision of Operation and Maintenance Manuals and compliance certification.

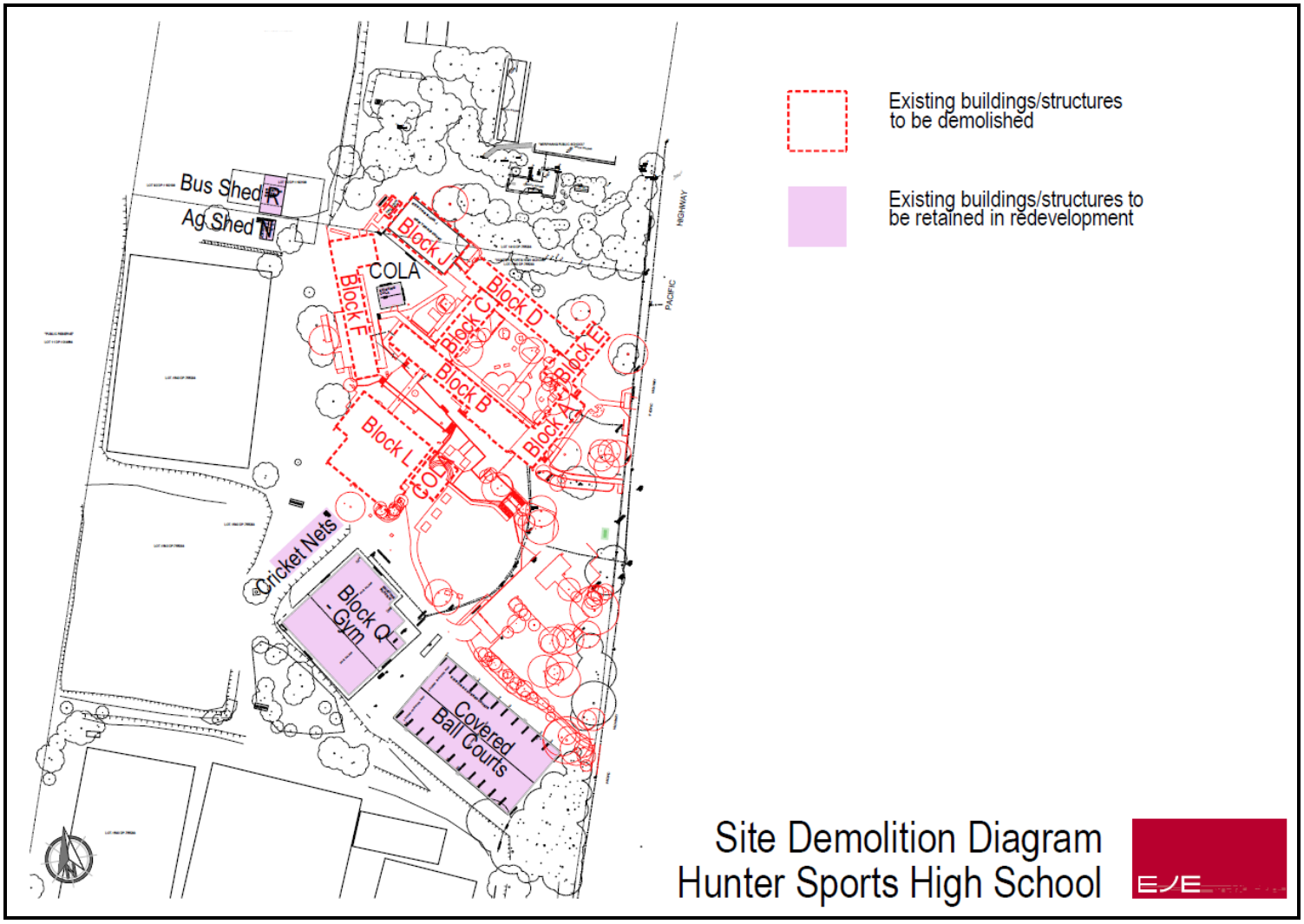

Figure 1 – Proposed Demolition

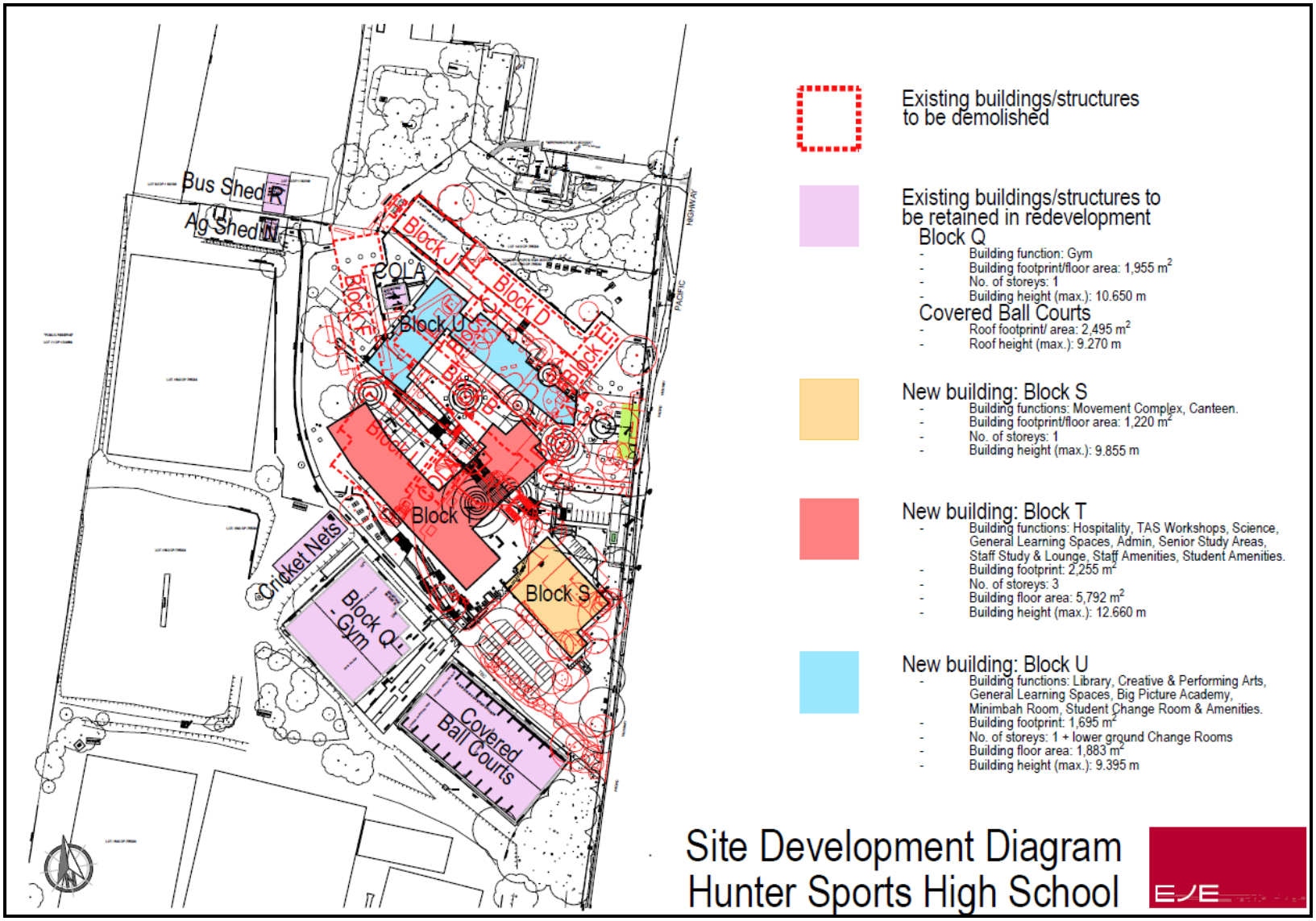

Figure 2 – Proposed Site Development

2.5 Teacher and Student Numbers

Hunter Sports High caters for years 7-12 with a population of 832 students in 2014. According to Mclaren Traffic Engineering (Appendix 17) student enrolments ranged between 832 and 966 between 2010-2014. Approximately 108 staff (69 teachers, 29 administration staff, 6 volunteers and 4 cleaners) are employed at the school. The school can also have up to 10 casual staff with a total of 98 staff expected on a typical school day.

The school consists of the following breakdown (2014 figures):

- 146 Year 7 students
- 151 Year 8 students
- 158 Year 9 students
- 167 Year 10 students
- 127 Year 11 students
- 83 Year 12 students.
- Special education unit consisting of 36 students and 4 staff.

Numbers of teachers and staff in 2016 are as follows:

- 773 students
- 69 staff.

It is important to recognise that numbers fluctuate over time. The school is a 5 stream high school designed to accommodate 850 enrolments. Teaching and student numbers are not expected to change as a result of the proposed development.

2.6 Hours of Operation

School lessons start at 9.30am and finish at 3.10pm on a typical school day. However, students and staff are at school outside of these times for activities common to any school for lesson planning, extracurricular activities or additional classes. As facilities improve, such “common” infrastructure such as the hall may be utilised for other activities or sporting facilities for non-school related sports.

2.7 Hours of Construction

To ensure the continuity of education of students and staff at the high school, on occasion some noise intensive construction activities may need to be conducted outside of standard construction hours. The three construction periods that are considered in this EIS are:

- Standard hours: Monday to Friday 7am to 6pm, Saturday 8am to 1pm , no work on Sundays or public holidays
- Out of hours construction 1: Monday to Friday 6pm to 10 pm, Saturday 7am to 8am and 1pm to 10pm, Sunday or public holidays 8am to 6pm
- Out of hours construction 2: Monday to Friday 10pm to 7am, Saturday 10pm to 8am and Sunday or public holidays 6pm to 7am.

2.8 Signage

Proposed external signage is shown in the signage schedule in Appendix 5. The signage proposed is in keeping with the area, in some cases reusing existing signage, and will be sympathetic to the overall development. Proposed signage includes the following:

- School electronic sign (relocate existing sign)
- Pylon signs (relocate existing)

- Inspirational quotes highlighting respect, responsibility and success printed on adhesive film fixed to curved wall
- Other walls including stair well, canteen and reception
- Building identification signage.

2.9 Landscaping

Landscaping plans have been prepared to provide a positive outcome for the school and integrate the development into the site and surrounds (Appendix 6). The landscape plans present a range of materials including tactile ground surface indicators, sandstone seating concrete bench seating and retaining walls. Landscaping has been designed to define various spaces within the site while providing appropriate low maintenance cover for the school grounds.

2.10 Materials and Finishes

The building will have a contemporary character with co-ordinated internal and external materials, textures and colour schemes. As shown in the architectural plans (Appendix 5) the exterior of the building will create interest through using various materials and finishes. The materials are annotated on the architectural plans and schedule of external finishes in Appendix 5 and include:

- Low sheen acrylic paint (including black caviar, whisper white, birdie, Adriatic blue, shale grey and wallaby)
- Concrete with clear steel trowel finish
- Brickwork including granite and grey
- Synthetic grass
- Colorbond (shale grey, wallaby and surfmist)
- Various metal finishes
- Other timber, ceramic and lighting finishes and fixtures.

2.11 Building Code of Australia

A review of proposed buildings against the Building Code of Australia (Appendix 22) assessed the referenced architectural documentation with respect to the Building Code of Australia 2015 as well as the Disability (Access to Premises – Buildings) Standards 2010. The design is at a point where the inherent BCA philosophies have been checked and development consent can be sought. The finer details with respect to BCA 2015 (or 2016) compliance can be finalised prior to the issue of a Construction Certificate.

3. Site Attributes and Location

3.1 Site Location

The site primarily comprises Lot 540 DP 755233 at 2 Pacific Highway, Gateshead and includes Lot 1410 DP 755233 and Lot 92 DP 119213. Development in the area includes residential and commercial. As shown on the location and aerial plans (Appendix 1 and 2) the site is adjacent to the Pacific Highway and commercial property to the east, Wiripaang Public School to the north and recreation land to the south and west.

The site has a total area of around 91,055m^2. Site area will not change as a result of the development.

Photo 1 – Frontage (looking north west)

Photo 2 – Administration (looking west)

Photo 3 – Existing Classrooms (looking south west)

Photo 4 – Playground (looking west)

3.2 Physical Features

3.2.1 Topography

Locally the geography is generally flat with a slight decline to the western boundary of the site. As shown in the survey in Appendix 5, the site generally falls to Johnsons Creek to the west.

3.2.2 Geotechnical

The site is located in Geotechnical Zone T6. According to Douglas Partners (Appendix 12) the site is underlain by carbonaceous clays (completely weathered coal). Site classification ranges from M to P due to 2 metre depth of filling encountered in one bore (Appendix 12).

3.2.3 Flooding

The site is considered a flood control lot – low hazard (Appendix 15). A stormwater management plan (Appendix 14) found major stormwater flows from rainfall events up to a 100 year ARI cannot be accommodated by the below ground pipe network and will be conveyed on the surface via overland flow along the line of the below ground system. Piped flows will pass through the detention system prior to discharge. Bypass flows will

travel over the surface and dissipate onto the playing fields to the south western part of the site adjacent to Johnsons Creek.

3.2.4 Vegetation and Trees

According to the Arborist report (Appendix 9) there is scattered vegetation in the area of proposed development. The area around the existing carpark and eastern boundary generally consists of remnant trees that are growing in relatively close proximity to each other. As can be expected in this situation many of the trees exhibit less than perfect form with crown asymmetry, suppression and poor branch structure being the predominant problem caused by phototropism. A number of trees along the eastern boundary have also been pruned significantly due to nearby overhead powerlines.

In other areas of the school the majority of trees have been planted and consist of locally occurring native species, non-local native species and exotics (Appendix 9).

3.2.5 Traffic and Access

Access from the Pacific Highway is the main vehicular entry that provides access to the administration building, carpark and school. A new entrance is proposed south of the existing entrance to serve as the main driveway.

3.2.6 Coastal Zone

The site is not located within the coastal zone.

3.2.7 Mine Subsidence

The site is located within a Mine Subsidence District and conditional approval has been granted by the Mine Subsidence Board (Appendix 7).

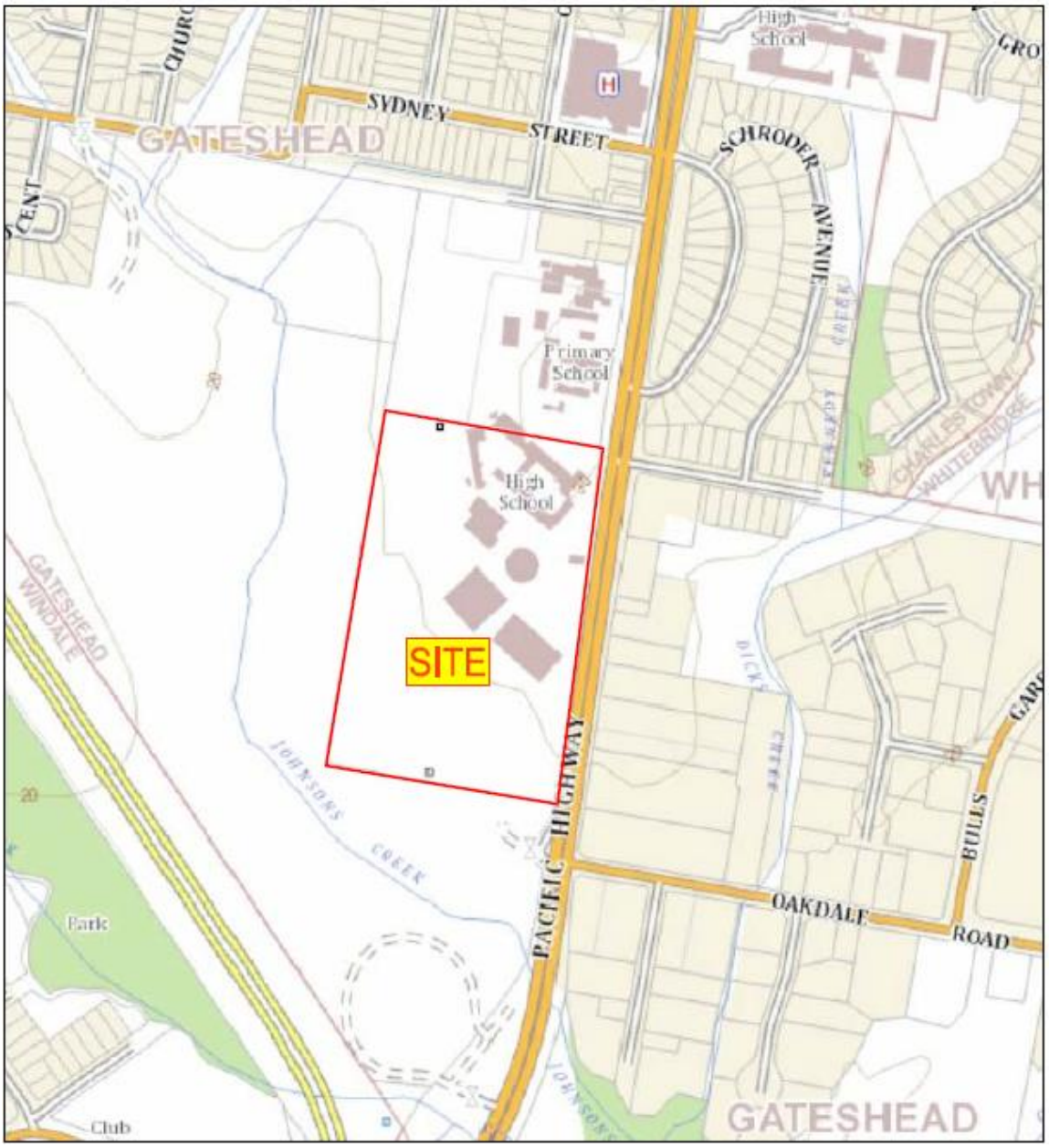

Figure 3 – Site Location

3.4 Surrounding Area

3.2.8 Land to the North

Wiripaang Public School is located immediately north of the site (on which the proposed shared car park will be located). A number of commercial premises are located further north on Hughes Street and Pacific Highway.

Photo 5 – Wiripaang School (looking north)

3.2.9 Land to the East

Commercial premises area located east of the site on the Pacific Highway. Commercial uses include car sales and car part sales.

Photo 6 – Commercial Premises on Pacific Highway (looking south east)

3.2.10 Land to the South

As shown in Appendix 2 recreation ovals and Johnsons Creek are located south of the site. The Newcastle Inner City Bypass is located further south.

Photo 7 – Recreation Oval and Johnsons Creek south of the site (looking south)

3.2.11 Land to the West

Johnsons Creek and recreation ovals are located west of the school. Residences are located west of the ovals.

Photo 8 – Vegetation, Recreation Oval and Johnsons Creek (looking west)

3.3 Building Code of Australia and Accessibility

A Pre-Construction Review of the proposed development (Appendix 22) and Accessibility Review (Appendix 16) were prepared to consider the Building Code of Australia (BCA) and access requirements.

A review of proposed buildings against the Building Code of Australia (Appendix 22) assessed the referenced architectural documentation with respect to the Building Code of Australia 2015 as well as the Disability (Access to Premises – Buildings) Standards 2010. The design is at a point where the inherent BCA philosophies have been checked and development consent can be sought. The finer details with respect to BCA 2015 (or 2016) compliance can be confirmed prior to finalising construction plans.

The Accessibility Review (Appendix 16) provides a comprehensive review of the proposed project documentation with consideration to all aspects of accessibility to the site and throughout the development and with reference to the Building Code of Australia (BCA), Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards), relevant Australian Standards as they relate to access to premises and the spirit and intent of the Disability Discrimination Act 1992 (Commonwealth) (DDA).

The proposed development is capable of achieving a high level of access for people with disabilities and meeting all the relevant standards. The design documentation is considered to be compliant once constructed if the recommendations within the BCA and Access Reports are incorporated.

4. STATUTORY CONTEXT

4.1 Commonwealth Legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national framework for environmental protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places. Part 3 of the EPBC Act lists nine matters of National Environmental Significance (NES) that may require approval from the Commonwealth Minister for the Environment. Further details regarding the impact of the development on places or matters of NES is provided in Section 7.

An action taken by any person on Commonwealth land that is likely to have a significant impact on the environment (Section 26(1)) or an action taken by any person outside of Commonwealth land that is likely to have a significant impact on Commonwealth land (Section 26(2)) may require approval from the Commonwealth Minister for the Environment. The proposal does not involve work by a Commonwealth agency and will not impact or be impacted by an activity, or impact, on Commonwealth land.

4.2 Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000

The proposal is development that requires consent pursuant to Part 4 the EP&A Act. The development is SSD in accordance with Section 89C(2) of the EP&A Act that states SSD may include development identified within a State Environmental Planning Policy, in this case State Environmental Planning Policy (State and Regional Development) 2011 (refer to Section 4.2.1).

Permissibility / existing use

Section 41 of the EP&A Act allows for the following:

> *(1) An existing use may, subject to this Division:*
>
> *(a) be enlarged, expanded or intensified, or*
>
> *(b) be altered or extended, or*
>
> *(c) be rebuilt, or…*

The proposed development will involve redevelopment of an existing approved use. Relevant existing development consents relate to an educational establishment that has been at the site for over 40 years. The proposed use will not change and as such the proposed development is permissible in the R2 Low Density zone under the provisions of Section 41 of the EP&A Act.

Certification

Under Section 109R of EP&A Act, the Crown self-certifies its own building work. In this instance the NSW Department of Education will manage its own certification under state building laws.

Contributions

Section 94 of the EP&A Act states if a consent authority is satisfied that development for which development consent is sought will or is likely to require the provision of or increase demand for public amenities and public services within the area, the consent authority may grant the development consent subject to a condition requiring dedication of land free of cost and / or payment of a monetary contribution. The proposed development is the replacement of existing buildings and will not increase demand for public amenities or services.

Information requirements

Section 89(G) of the EP&A Act requires a development application for SSD to be accompanied by an EIS prepared by or on behalf of the applicant in the form prescribed by the EP&A Regulation. Schedule 2 of the EP&A Regulation outlines the requirements of the Secretary of the Department of Planning & Environment and approval bodies relating to the preparation of an EIS.

In accordance with Schedule 2, Section 3, an application was made to the Secretary for the Environmental Assessment Requirements (SEARs) with respect to the proposed development. SEARs were provided on 21 March 2016 (Appendix 32) and are summarised in Table 4.1 with a corresponding comment on where each requirement has been addressed in the EIS.

Table 4.1 – Summary of Secretary's Environmental Assessment Requirements (SEARs)

Matter	Key Issues to be addressed	Relevant Section of EIS
General requirements	Prepared in accordance with Schedule	Section 1 and Throughout
	Environmental Risk Assessment	Section 6.17
	Baseline data, potential cumulative environmental impact and environmental management measures	Section 6
	Quantity surveyor providing CIV, estimated number of jobs during construction and operation and certification	Section 1.3 and 6.10 and Appendix 4
Key Issues	Statutory and Strategic context	Section 4
	Permissibility	Section 4
	Development standards	Section 4.2.6
	Policies	Section 4.3
	Built form and urban design	Section 2.3 and 6.8
	Environmental amenity	Section 6
	Transport and accessibility	Section 6.1
	Ecologically sustainable development	Section 6.16
	Biodiversity	Section 6.6 and Appendix 11
	Aboriginal heritage	Section 6.7
	Noise and vibration	Section 6.5 and Appendix 26
	Contamination	Section 6.2 and Appendix 13
	Utilities	Section 4.2.6
	Contributions	Section 4.2
	Drainage	Section 6.3
	Flooding	Section 6.3
	Waste	Section 6.11
	Bushfire	Section 6.6
Plans and documents	Architectural	Section 2.3 and 6.8 and Appendix 5
	Survey	Section 3.2.1
	Site analysis	Section 2.3 and Appendix 5
	Stormwater concept	Section 6.3
	Sediment and erosion control	Section 6.3

Matter	Key Issues to be addressed	Relevant Section of EIS
	Shadow diagrams	Section 2.3 and 6.8 and Appendix 5
	View analysis / photomontages	Section 6.8 and Appendix 5
	Landscape plan (including tree removal and retention)	Section2.8 and Appendix 6
	Preliminary construction management plan	Section 10
	Geotechnical and structural report	Section 6.2 and Appendix 12
	Accessibility report	Section 3.4 and Appendix 16
	Arborist report	Section 6.6 and Appendix 9
	Acid sulfate soils management plan	Section 6.2
	Schedule of materials and finishes	Section 2.9 and Appendix 5
Consultation	Local, State and Commonwealth government authorities	Section 5
References	Guidelines, policies and plans	Section 12

4.3 State Environmental Planning Policy (State and Regional Development) 2011

Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011 identifies State Significant Development as follows:

> *"15 Educational establishments*
>
> *Development for the purpose of educational establishments (including associated research facilities) that has a capital investment value of more than $30 million."*

The capital investment value for the proposed development is $30,671,743 (Appendix 4) and as such is identified as State significant development under the SEPP.

4.4 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure) seeks to provide a consistent planning regime for infrastructure and the provision of services across NSW. Clause 28(2)(a) and (b) of SEPP Infrastructure states development for the purpose of educational establishments may be carried out by any person with consent on land on which there is an existing educational establishment and on land adjacent to the existing educational establishment.

Part 3 Division 3 of SEPP Infrastructure identifies development for the purpose of educational establishments that can occur as exempt, complying, without consent and with consent. However, Section 89E(4) of the EP&A Act states if part of a single proposed development that is State significant development requires development consent to be carried out and the other part may be carried out without development consent then Part 5 does not apply and the proposed development is taken to be development that may not be carried out except with development consent. The project has been identified as SSD under State Environmental Planning Policy (State and Regional Development) 2011.

Permissibility

Clause 27 of SEPP (Infrastructure) identifies the *R2 Low Density Residential* zone as a *Prescribed Zone*. Clause 28 of SEPP (Infrastructure) states:

"(1) Development for the purpose of educational establishments may be carried out by any person with consent on land in a prescribed zone.

…

(2) Development for any of the following purposes may be carried out by any person with consent on any of the following land:

(a) development for the purpose of educational establishments—on land on which there is an existing educational establishment,"

The proposed development is permissible with consent in the R2 Low Density Residential zone pursuant to Clause 28 of SEPP (Infrastructure).

Policies

Clause 32 of SEPP (Infrastructure) states:

> *Before determining a development application for development for the purposes of a school, the consent authority must take into consideration all relevant standards in the following State government publications (as in force on the commencement of this Policy):*
>
> *(a) School Facilities Standards—Landscape Standard—Version 22 (March 2002)*
>
> *(b) Schools Facilities Standards—Design Standard (Version 1/09/2006)*
>
> *(c) Schools Facilities Standards—Specification Standard (Version 01/11/2008).*

The School Facilities Standards have now been replaced with the "Education Facilities Standards and Guidelines (EFSG)". They set out the minimum standards and design criteria for all new Department of Education projects. The EFSG website states that "These documents are not intended to limit facilities planners, in consultation with project stakeholders, from exercising creativity in providing alternative solutions within the available project budget". Hunter Sports High School has been designed in reference to the EFSG and where consultation with stakeholders has led to a departure from these guidelines; these departures have been documented and signed-off.

Traffic generating development

Schedule 3 of SEPP (Infrastructure) states educational establishments that have a capacity of 50 or more students is considered a Traffic Generating Development that needs to be referred to RMS. The school currently educates 850 students, furthermore the Pacific Highway is under care and control of RMS, and as such the proposal will be referred to RMS.

RMS has advised (Appendix 18) *"there are numerous constraints at this location, and as the development does not include any increase in student or staff numbers, a formal deceleration will not be required. Roads and Maritime considers that the removal of parking on approach to the proposed driveway (that is designed with appropriate splays and width) will be sufficient to ensure the safety and efficiency of the Pacific Highway is not compromised. The amount of parking to be removed will be subject to further investigation*".

4.5 State Environmental Planning Policy No.14 – Coastal Wetlands

The aim of this policy is to ensure that coastal wetlands are preserved and protected in the environmental and economic interests of the State. The boundaries of designated wetlands covered by State Environmental Planning Policy No.14 – Coastal Wetlands (SEPP 14) are mapped under the policy.

According to the Biodiversity Assessment Report (Appendix 11) the study area is located within the Jewells Swamp catchment, a small catchment on the eastern side of Lake Macquarie within the Lake Macquarie LGA. The study area is drained by Johnson's Creek to the west, a second order stream that flows south-easterly into Jewells Swamp via Scrubby Creek. The wetland is drained by Crokers Creek that enters the Pacific Ocean at Nine Mile Beach, Redhead. No identified streams or watercourses flow through the study area itself. Jewells Swamp is a wetland listed by SEPP 14; therefore the study area is within the catchment of a SEPP 14 wetland (Appendix 11).

4.6 State Environmental Planning Policy No.44 – Koala Habitat Protection

State Environmental Planning Policy No.44 – Koala Habitat Protection (SEPP 44) aims to encourage the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range and to reverse the current trend of koala-population decline. It applies to areas of native vegetation greater than one hectare and for Councils listed in Schedule 1 to the SEPP.

According to the Biodiversity Assessment Report (Appendix 11) the study area is located within the Lake Macquarie LGA, a Schedule 1 listed Council, however the area of native vegetation involved is less than one hectare therefore SEPP 44 is not relevant to the current assessment and is not discussed further.

4.7 State Environmental Planning Policy No.55 – Remediation of Land

State Environmental Planning Policy No.55 – Remediation of Land (SEPP 55) aims to promote remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. A Preliminary and Targeted Site Investigation for Contamination was prepared by Douglas Partners (Appendix 13). The investigation found the site is considered to be generally suitable for the proposed development, subject to remediation and/or management of identified impacts including preparation of a Remediation Action Plan and testing soil prior to removal from site. The Remediation Action Plan (Appendix 31) states implementation of the Remediation Action Plan will render the site suitable for the proposed development and proposed site remediation works are considered to be Category 2 under SEPP 55 and do not require development consent. Contamination is discussed in Section 6.2.

4.8 Lake Macquarie Local Environmental Plan 2014

Section 89E(2) of the EP&A Act states development consent may not be granted if the development is wholly prohibited by an environmental planning instrument. The Lake Macquarie Local Environmental Plan 2014 (LEP) provides a planning framework to facilitate development in an appropriate manner with due consideration to ecologically sustainable development. Relevant Clauses of the LEP are discussed in Table 4.2.

Table 4.2 – Consistency with LEP 2014

Clause	Consistency
1.2 Aims	The LEP provides for appropriate development within the LGA. The proposal has given due consideration to the site and surrounds and is in keeping with the aims of the LEP.
2.1 Land use zones	The site is zoned R2 Low Density Residential (see Appendix 3).
2.3 Zone objectives	Objectives of the R2 zone are as follows: ➢ To provide for the housing needs of the community within a low density residential environment. ➢ To enable other land uses that provide facilities or services to meet the day to day needs of residents. ➢ To encourage development that is sympathetic to the scenic, aesthetic and cultural heritage qualities of the built and natural environment. The proposal provides for the development of an existing site that has been used for educational purposes for over 40 years. The proposed development is permissible with consent pursuant to *SEPP (Infrastructure)* (see Section 4.2.2). Furthermore, the educational establishment is an existing use under Section 41 of the EP&A Act (Section 4.2) and the redevelopment is permissible as an existing use. The proposal is permissible under SEPP (Infrastructure) and as an existing use and as such is not wholly prohibited and can proceed with consent.
4.3 Height of buildings	The maximum building height for the site is 8.5 metres. Maximum building height of the proposed redevelopment is approximately 12.66 metres.
4.4 Floor space ratio	Council has not adopted a floor space ratio in the LEP.
4.6 Exceptions to development standards	Flexibility is provided in the LEP for certain development standards for particular development. The maximum building height is appropriate to the site and its location to achieve an architecturally designed building that meets the needs of high quality education facilities. At the concept meeting Council advised that "it is not anticipated that there would be any unacceptable impacts resulting from a height non-compliance, having regard to current use of the site, existing development within the locality and the fact that the site is not directly adjacent to any residential properties" (Appendix 8). It is considered unnecessary and unreasonable to require an 8.5 metre maximum height for the school site and as such an exception to the development standard is required to achieve the overall objectives of the development.
5.6 Architectural roof features	Architectural plans are provided in Appendix 5 and provide a range of designs and contemporary roof treatments.
5.9 Preservation of trees or vegetation	This SEE forms part of the application for consent for the proposed development that includes removal of trees. The Arborist Report (Appendix 9) recommends removal of trees or retention and pruning of deadwood. A Biodiversity Assessment Report has been prepared to assess the environmental impact of vegetation removal (Appendix 11). A Landscape Plan has been prepared to ameliorate loss of trees and soften built form of the proposed development (Appendix 6).
5.10 Heritage conservation	The site is not located in heritage precinct and does not contain known heritage items.
6.2 Public utility infrastructure	Services are available to the site and will be augmented as required for the proposed development.

Clause	Consistency
7.1 Acid sulfate soils	The site is not mapped by Council as containing acid sulfate soils.
7.2 Earthworks	Earthworks will occur across the site to accommodate buildings and floor levels. EJE has advised that maximum fill will be approximately 2.2 metres under the covered learning undercroft in Block T.
7.3 Flood planning	Council has identified the site as a Flood Control Lot – Low Hazard.
7.4 Coastal risk planning	The site is not identified as a coastal risk.
7.5 Terrestrial biodiversity	The Arborist Report (Appendix 9) identifies and records relevant data pertaining to trees located within the nominated site. Further, it includes an impact assessment on how the proposed development may affect the trees and where suitable, provide recommendations for the management of trees to be retained both during and after construction. A Biodiversity Assessment Report was prepared to consider impact of the proposed development on flora and fauna (Appendix 11). The report found two ecosystem credits for Plant Community Type - Smooth-barked Apple – Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands are required to offset the impacts on that vegetation type due to the proposed development.
7.21 Essential services	Essential services will be provided to the proposed development. Through the development process application to the relevant service authorities will be required.

4.8.1 Other NSW Legislation

Table 4.3 details relevant NSW legislation, purpose of the legislation and its relevance to the Proposal.

Table 4.3 – Legislative Requirements and Approvals

Legislation (Responsible Agency)	Purposes of Legislation	Relevance to the Proposal and Approval Requirements
Contaminated Land Management Act 2008	The Act establishes a process for investigating and (where appropriate) remediating land that the Environment Protection Authority (EPA) considers to be contaminated significantly enough to require regulation under Division 2 of Part 3. Furthermore, under Section 60 a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify the EPA when they become aware of the contamination.	The Report on Targeted Site Investigation for Contamination (Appendix 13) found the site is considered to be generally suitable for the proposed development, subject to remediation and/or management of identified impacts. Section 12 of the investigation (Appendix 13) states an assessment of the requirement to report contamination for the subject site has been made with reference to the EPA guidelines (NSW EPA, 2015). With reference to the processes and notification triggers in the guidelines, it is considered that a notification to the NSW EPA is not required for the subject site (Appendix 13). Recommended control measures and ongoing management of identified contamination (as recommended in Section 12.1 [of Appendix 13]) are considered appropriate for the proposed development and ongoing site use. A Remediation Action Plan has been prepared for the development (Appendix 31)
Environmentally Hazardous Chemicals Act 1985	The Act regulates use and storage of environmentally hazardous chemicals or declared chemical waste. It provides the OEH with assessment and control mechanisms for chemicals and chemical wastes.	No storage of environmentally hazardous chemicals or declared chemical waste is proposed. No further assessment is required.
Fisheries Management Act 1994 and Fisheries Management Regulation (General) 2002	The objects of this Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It outlines the circumstances in which approvals are required in order to carry out dredging or reclamation work, and the exemptions that apply. Reclamation work refers to using any material to fill in or reclaim water land, or depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or draining water from water land for the purpose of its reclamation.	No approvals or licences are required pursuant to the Fisheries Management Act 1994 and the Fisheries Management Regulation (General) 2002.
Heritage Act 1977	The Heritage Act is administered by the Heritage Office within the Office of Environment & Heritage and concerns protection and restoration and enhancement of State heritage items. The relevant provisions of the Act are: ➢ Section 139 prohibits disturbance of a relic unless an excavation permit is obtained from the Heritage Office ➢ Section 146 requires notification to the Heritage Office of any discovery of relics.	No State or local heritage items are listed for the site or immediate vicinity. The Proposal will not require removal of or impact to a heritage item.
Mine Subsidence Compensation Act 1961	Section 15 requires approval to alter or erect improvements within a mine subsidence district or to subdivide land therein.	Conditional approval has been granted by the Mine Subsidence Board (Appendix 7)
National Parks and Wildlife Act 1974	The Act aims to conserve nature and objects, places or features of cultural value. An Aboriginal Heritage Impact Permit is required	An Aboriginal Heritage Information Management System (AHIMS) search returned 1 Aboriginal heritage site and no Aboriginal places at the site

Legislation (Responsible Agency)	Purposes of Legislation	Relevance to the Proposal and Approval Requirements
	under Section 90 to harm or desecrate Aboriginal objects or places.	or within 50m (Appendix 21). Assessment under the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (NSW Government Department of Environment, Climate Change & Water, 2010) found the proposal can proceed with caution (Section 6.7).
Native Vegetation Act 2003	The Act aims to prevent broad scale clearing, protect native vegetation of high conservation value and improve conditions of existing native vegetation.	The Act provides for, encourages and promotes the management of native vegetation on a regional basis and regulates the clearing of native vegetation on land in NSW. Under the Act no clearing of native vegetation is allowed except in accordance with prior development consent from the relevant Council or under a Property Vegetation Plan (PVP) approved by the relevant Catchment Management Authority. Lake Macquarie City Council is one of the LGAs to which the Act applies. The study area is zoned R2 Low Density Residential. This zone is excluded from requirement for assessment under the Act. Therefore the *Native Vegetation Act 2003* is not relevant to the current assessment (Appendix 11).
Noxious Weeds Act 1993	Objects of the Act include reducing negative impact of weeds on the economy, community and environment of NSW.	Refer to Section 6.6 for further discussion on weed management.
Protection of the Environment Operations Act 1997	The POEO Act primarily regulates pollution control and waste disposal in NSW and is administered by the OEH. It identifies development for which a POEO Licence is required.	Reasonable and feasible environmental measures must be implemented to minimise pollution as a result of the Proposal. Refer to Section 10 for environmental management measures that will ameliorate potential impact to the environment.
Roads Act 1993	Objects of the Act are to, among other things, confer certain functions (in particular, the function of carrying out road work) on RMS and on other roads authorities, and to provide for the distribution of the functions conferred by this Act between RMS and other roads authorities.	Traffic issues are addressed in Section 6.1.
Rural Fires Act 1997	Under Section 63 public authorities must take all practicable steps to prevent the occurrence and spread of bush fires on or from land vested in or under its control or management.	A Bushfire Threat Assessment has been prepared (Appendix 10). The subject land is identified as being bushfire prone land on the Lake Macquarie City Council Bush Fire Prone Land Map and the development is defined by the EP&A Act as Special Fire Protection Purpose (SFPP) development. The development therefore has been assessed to comply with Section 100B of the Rural Fires Act 1997, which includes the consideration of the NSW Rural Fire Service (RFS) document Planning for Bushfire Protection 2006 (NSWRFS 2006), referred to as 'PBP'. Bushfire is discussed in Section 6.6.
Soil Conservation Act 1938	The Act allows for conservation of soil resources and erosion mitigation.	Erosion and sediment control is discussed in Section 6.3. and Appendix 14
Threatened Species Conservation Act 1995 (TSC Act)	A 7-Part Test assessment of significance is a set of factors which must be considered by decision makers regarding the effect of a proposed development or activity on threatened species, population or ecological communities or their habitats, in accordance with section 5A	Flora and fauna are discussed in Section 6.6 and Appendix 11.

Legislation (Responsible Agency)	Purposes of Legislation	Relevance to the Proposal and Approval Requirements
	of the EP&A Act. If there is a chance of an impact, then a 7-Part Test assessment of significance is required to determine the significance of the impact. If there is likelihood for a significant impact on threatened species, populations and their habitat or on ecological communities then a Species Impact Assessment is required.	
Waste Avoidance and Resource Recovery Act 2001	Objects of the Act include encouraging efficient use of resources and reducing environmental harm in accordance with the principals of ecologically sustainable development. The Act establishes the waste hierarchy of avoidance, resource recovery and disposal.	Waste management is discussed in Section 6.11.
Water Management Act 2000	The Act outlines approval requirements for activities at a specified location in, on or under waterfront land. Waterfront land includes the bed of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary. The Act also outlines water access rights and approval / concurrence requirements for use of groundwater and surface water runoff. Taking groundwater that is not managed by a water sharing plan requires a groundwater licence (Section 92).	No work will occur within 40 metres of waterfront land. A controlled activity approval is not required for the proposed development. Potential impact to watercourses is discussed in Section 6.3. The development is unlikely to require extraction of significant amounts of groundwater. However, if during construction more than 3 megalitres of groundwater is proposed to be extracted an approval/license is required from the NSW Office of Water.
Work Health and Safety Regulation	Chapter 8 of the Regulation details prohibitions and authorised conduct in relation to asbestos and asbestos containing material.	Approval is required from WorkCover NSW for asbestos removal work.

4.9 NSW Plans

4.9.1 NSW State Priorities

One of the NSW State priorities is improving education standards as well as academic result. The proposed redevelopment of Hunter Sports High will provide quality facilities for students and staff to provide ongoing improvements in education in the region and NSW. The proposed development is in keeping with the NSW State priorities.

4.9.2 NSW Long Term Transport Master Plan 2012

Traffic arrangements to and from the site will not alter significantly and in any case the proposal will require referral to the NSW Roads and Maritime Services. The proposed redevelopment will have a positive impact on traffic and as such is in keeping with the NSW Long Term Transport Master Plan.

4.9.3 Hunter Regional Transport Plan 2014

Movement of traffic to and from the site has been considered in the development. A Traffic & Parking Impact Assessment and Supplementary Information (Appendix 17) found the proposed development sufficiently caters for the safe and efficient operation of the high school in regards to traffic and parking. A bike and car parking arrangement plan is provided in Appendix 25.

4.9.4 Healthy Urban Development Checklist, NSW Health

Reflecting the understanding of health and urban development and the determinants of health, the ten characteristics of healthy urban development focused on in the Healthy Urban Development Checklist are:

- Healthy food

- Physical activity
- Housing
- Transport and physical connectivity
- Quality employment
- Community safety and security
- Public open space
- Social infrastructure
- Social cohesion and social connectivity
- Environment and health.

As an educational establishment focused around academia and sports, Hunter Sports High promotes physical activity, healthy food, community involvement and quality education. The school provides appropriate levels of sporting activity and facilities for students and allows for a healthy lifestyle. The proposed redevelopment which will sustain and improve the schools existing activities is in keeping with the Healthy Urban Development Checklist.

4.10 Regional Plans

4.10.1 Draft Hunter Regional Plan

The proposal is consistent with the draft Hunter Regional Plan. Action 4.2.6 Plan for schools to meet growing and changing needs is relevant to the proposal. The Plan identifies that schools in existing centres will experience the greatest growth, and schooling needs in the region are constantly changing. The plan states there are opportunities to improve provision and distribution of school places across the region. The proposed redevelopment will provide facilities designed to meet current and future education needs in the immediate area and within the region.

5. CONSULTATION

5.1 Agencies

EPA

A meeting was held with the NSW Environment Protection Authority (EPA) on 7 April 2016. SEARs were discussed at the meeting, including need for a licence under the *Protection of the Environment Operations Act 1997*. Matters raised in the meeting were also raised in the SEARs and have been addressed in this EIS.

OEH

A meeting was held with the NSW OEH on 8 April 2016. SEARs were discussed at the meeting, including need for specialist ecology, flooding and heritage reports. Matters raised in the meeting were also raised in the SEARs and have been addressed in this EIS.

RMS

A meeting was held with RMS on 29 October 2015. An email dated 30 October 2015 RMS advised *"there are numerous constraints at this location, and as the development does not include any increase in student or staff numbers, a formal deceleration will not be required. Roads and Maritime considers that the removal of parking on approach to the proposed driveway (that is designed with appropriate splays and width) will be sufficient to ensure the safety and efficiency of the Pacific Highway is not compromised. The amount of parking to be removed will be subject to further investigation*" (Appendix 18).

5.2 Lake Macquarie City Council

A Pre-Lodgement Concept Meeting was held with Lake Macquarie City Council (Appendix 8). Key issues discussed were:

- Architectural design
- Engineering
- Traffic
- Access
- Stormwater
- Ecology
- Landscaping
- Bushfire
- Materials and finishes
- Visual impact
- Crime prevention
- Mine subsidence
- Section 94 contributions.

Comments from the meeting were considered in the design of the redevelopment.

5.3 Community

Fortnightly Project Review Group meetings have been held at the school throughout the master planning and design process. The Project Review Group consists of the Director of Public Schools for Lake Macquarie East, the Hunter Sports High School Principal, the vice President of the Aboriginal Education Consultative Group, the President of the Parents and Citizens Group, the Asset Manager from Department of Education Hunter/Central

Coast Asset Management Unit, the schools communication officer, the Project Manager, the design architects and others on an as needed basis.

The vice President of the Aboriginal Education Consultative Group has been the conduit between the Project Review Group and the Aboriginal community. In this way the community has been kept informed of the redevelopment plans and provided feedback to the Project Review Group. The design team presented the proposed design to the Aboriginal Education Consultative Group Annual General Meeting in December 2015. Feedback and input were considered in the development of the design

Likewise, the President of the Parents and Citizens Group has been the conduit between the Project Review Group and the Parents and Citizens Group providing feedback and input into the design development. The design team presented the proposed design to the Parents and Citizens Group meeting in December 2015.

School students have been engaged in furniture selection and through a design competition to propose the graphics for the entry to the school. School staff have been involved in reviewing the layout of spaces specific to their area of teaching.

The project team has also consulted with the wider community through two community surveys, an information booth at a local shopping centre and at a community event. The survey responses were considered in the development of the design.

The school has maintained communication with the neighbouring Wiripaang Public School and businesses in the vicinity of the school in relation to the proposed development.

The school has also maintained regular updates of project progress on the school's website (which has a dedicated page for the redevelopment), the school's Facebook page and the fortnightly school newsletters. Any feedback from these communications has been collated by the school's communication officer and provided to the Project Review Group. The feedback has been overwhelmingly positive with only one or two negative comments which have been addressed.

5.4 Exhibition

After lodgement of the application, community consultation will be undertaken in accordance with the EP&A Act. Section 89F of the EP&A Act outlines exhibition and notification requirements for SSD and requires the consent authority to:

> (a) place the application and any accompanying information on public exhibition for a period (of not less than 30 days) prescribed by the regulations (the submission period) commencing on the day after which notice of the application is first published as referred to in paragraph (b), and
>
> (b) cause notice of the application to be given and published in accordance with the regulations.

6. ENVIRONMENTAL ASSESSMENT

6.1 Traffic and Transport

6.1.1 Existing Environment

A Traffic and Parking Impact Assessment and Supplementary Information summarise the existing situation and potential impact of the redevelopment (Appendix 17). The existing Traffic and Parking Impact Assessment is based on an earlier development scheme and has been updated through several documents (Appendix 17).

The school is surrounded by a number of sports fields and is located adjacent to Gateshead Public School with Lakeside Public School, Wiripaang Public School and Lake Macquarie Private Hospital located further to the north along the Pacific Highway. The school is accessed from the Pacific Highway with an off-street carpark on site that caters for all staff driving to work. The school contracts Newcastle Buses for its bus service and in 2014 430 students had bus travel passes (or 1 per 1.9 students or 52%).

There are currently approximately 50 formal parking spaces with opportunity for informal parking located at the northern boundary of the school, shared with the primary school (refer to Figure 4 for location of existing on site car parking). Kerbside parking is available on the western side of the Pacific Highway and capacity is not exceeded during peak usage. The Pacific Highway is located east of the site and has the following characteristics:

- RMS classified State Road (Road No. 10)
- Approximately 23 metres in width kerb-to-kerb
- Divided four lane (two lanes in each direction) carriageway with restricted parking on either side of the road
- 60km/h speed limit applies, reducing to 40km/h during school zone periods
- 1.2-2 metres wide footpaths along either side of the road
- Indented bus stop located along the school frontage
- Access to Hunter Sports High School existing staff carpark
- Southbound U-turn facility at Oakdale Road to the south of the school.

Other roads in the area are local roads with 50km/h speeds limits reducing to 40km/h during school zone periods. The driveway provides vehicular access to all site parking including heavy vehicles such as 20 seater buses.

Public Transport

In terms of public transport Newcastle buses operates two public services along the site frontage being the 349 and 350 routes. Both services run half hourly in both directions providing a good link to the Charlestown Bus Interchange and further into the Newcastle CBD.

Intersection Performance

Intersection performance analyses were completed at four intersections using SIDRA modelling for their existing conditions and traffic volumes. These included intersections of Pacific Highway with:

- Sydney Street and The Crescent
- Hughes Street
- Macquarie Avenue
- Oakdale Road.

The intersections operate at Levels of Service (LoS) A, B and C. It is assumed that a portion of the vehicles surveyed to park after 9am and prior to 3pm are student drivers (estimated as 7-10 vehicles parking on the Pacific Highway) which result in negligible impact on the existing operation.

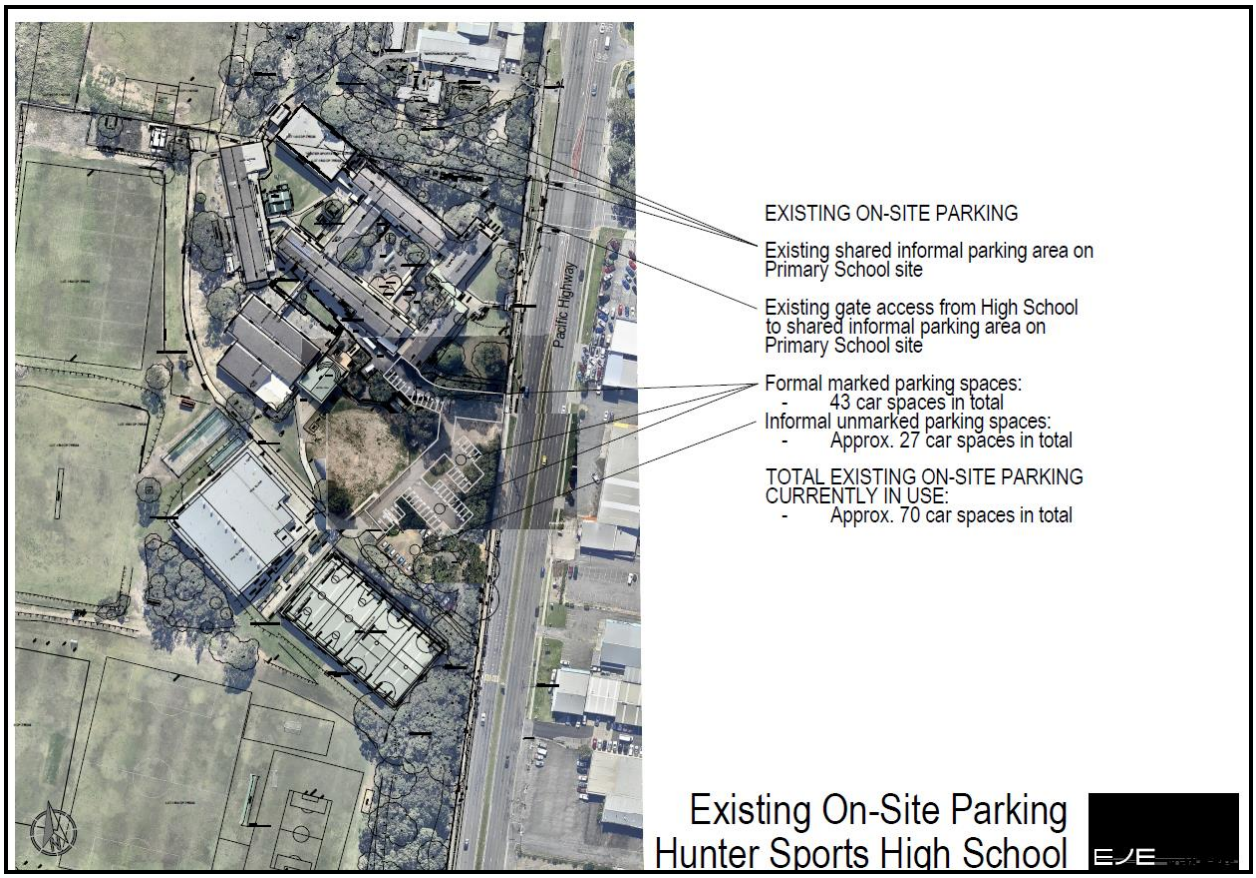

Figure 4 – Existing On Site Car Parking

6.1.2 Potential Environmental Impact

The Traffic and Parking Impact Assessment and Supplementary Information (Appendix 17) considered impacts on the site from the proposed development with no increase in students. Parking demand will remain the same and parking provision will be similarly provided on site with a minimum of approximately 70 spaces in total including 62 informal and 8 formal spaces. The proposed parking is split into three separate areas:

- Existing indented bus stop on Pacific Highway to be retained (student walking distance from bus stop to building core will be increased but is acceptable)
- Shared informal parking to the north of the site, share with Wiripaang Public School. This parking is not currently utilised by high school staff and will facilitate approximately 36 spaces
- Existing formal 8 visitor spaces directly to the north of Block S
- Redesigned informal parking to the south of Block S to include approximately 26 spaces and a one-way through system facilitating drop-off of assisted transport students with access provided via a new two-way driveway from the Pacific Highway
- 24 secure bicycle spaces, where none are currently provided on-site
- Kerbside parking is readily available on the western side of Pacific Highway and is currently utilised for the drop-off and pick-up of students. The proposed driveway result in the removal of one (1) kerbside space. The loss of one space will not impact the safe operation of the school or the Pacific Highway.

6.1.2.1 Construction Traffic and Parking

Construction vehicles will enter and exit the site outside of peak times, partly during the school holiday period (when peak flows are greatly reduced). The design of the internal site areas and driveways is sufficient to accommodate typical construction vehicles with no concerns and it is expected that the parking of workers will be

contained entirely within the site. No unreasonable impact on the surrounding traffic and parking conditions will result from the proposed construction on the subject site.

6.1.2.2 Parking Spaces

Existing parking areas do not appear to strictly comply with AS2890.1, but operate safely and efficiently on the basis that all users of the car parks are regular staff with typically tidal vehicular flows into and out of the car parking areas. The proposed parking areas, while similarly technically non-compliant with AS2890.1 (in that although the parking module and circulation aisle sizes used to calculate the resulting vehicle capacity are in accordance with the requirements of the Standard, parking modules are not line-marked in accordance with AS2890.1), are an improvement upon the design of the existing parking areas in terms of parking and manoeuvring.

Implementation of a one-way through drop-off and pick-up area for assisted transport students and for the school's existing 20 seat bus (Toyota Coaster) present improved outcomes in terms of disabled access and child safety. In terms of safety and efficiency, the proposed operation of the parking areas will exceed that of the existing on-site parking arrangements.

Lake Macquarie Development Control Plan 2014 (DCP) Part 3 – Development in Residential Zones requires 1 space per 1.5 full-time staff and 1 additional space per 50 students. Applying the rate from the DCP the total parking requirement for the school is summarised in Table 6.1.

Table 6.1 – DCP Parking Requirement

Land use	Type	Scale	Rate	Spaces required
High School	Staff	98	1 space per 1.5 full-time staff	65
	Students	900	1 space per 50 students	18
Total				**83**

As shown above the school requires a total of 83 off street spaces. The existing school provides 70 staff spaces on site with significant nearby adjacent kerbside parking being available for parents during drop-off and pickup times.

At the concept meeting with Council (Appendix 8) Council's traffic engineer advised that Council would prefer car-parking to be onsite (particularly staff parking) as it is safer and provides a better outcome. The Traffic and Parking Impact Assessment and Supplementary Information (Appendix 17) found existing parking will be sufficient if the proposal is the same size or smaller than the existing school (in regards to student and staff numbers).

A visual representation of proposed car parking, bicycle storage and access is provided in Appendix 25 and Figure 5. The diagram shows the following arrangements:

- Shared informal parking on Wiripaang Public School grounds of approximately 44 spaces (36 for the high school)
- Formal parking for 8 visitor spaces
- Informal unmarked parking on Hunter Sports High of 26 cars
- Secure bicycle racks near main entrance to school of 24 racks
- New driveway for internal access to school grounds
- Assisted transport student drop off zone near new driveway entrance
- Existing public bus drop off and pick up at front of school
- Total formal and informal car parking spaces shown is 70.

<u>Parent Parking</u>

The practical and efficient provision for parent parking should follow the "Interim Guideline for the Planning and Design of School Traffic and Pedestrian Facilities" as published by the RMS (formerly Traffic Authority of NSW) which states the following in respect of parent parking:

"It is recommended that off-street parent pick-up and drop-off zones should ideally be provided off the vehicular carriageway with left in, left out movements. This would facilitate students to leave the vehicle and step immediately on to the footpath, and vice versa. The parent pick-up / drop-off zones, if provided, require complete separation from the bus zone.

The length of a car pick-up zone can be determined by estimating the maximum number of cars likely to arrive at any one time. To avoid U-turn movements at these zones, signposting and barrier lines should be used."

Given the length of the Pacific Highway frontage, the site proposes to retain use of the existing kerbside parking and 5 minute time restriction during drop-off and pick-up times for the school, and extend the zone for the length appropriate to facilitate the anticipated demand of the school in peak times.

Typically school movements suggest that approximately 120 cars will pickup students in the 30 minutes following the school day ending. The parking counts in Annexure E (of Traffic and Parking Impact Assessment Appendix 17) show the common occurrence of parents to arrive up to 30 minutes prior to school closing to wait for the students. In the case of this school, approximately 50 cars per day arrive early. Parking demand analysis utilises average rates for pickup efficiency though do not account for early arrival of some cars. The analysis however suggests that if parents only started arriving once school ended then 17 spaces are adequate 66% of the time, 18 spaces would meet the demand 89% of the time but 20 spaces would meet the demand 99% of the time. This analysis is only an indication but does show support of the Development Control Plan and DEC requirement for 18 parking spaces to be available for pickup operations. It is recommended that the 5 min parking zone be shifted to the south to be located closer to the proposed school core and be extended to a length of 120 metres starting 10 metres downstream of the southern driveway entrance. This would ensure there is a minimum of 20 spaces available to parents in the pick-up time, with a further 11 un-restricted spaces available at the northern end of the parking area prior to the traffic signals. Since the school's location allows a minimum of 20 and up to 31 cars to be parked kerbside on the safe side of the road, the parent parking supply is deemed to be satisfied safely, efficiently and numerically adequate.

Servicing

Currently the site completes servicing and delivery operations from within the informal existing car park. This operation is satisfactory and shall be maintained. Once the southern carpark is constructed, it may be appropriate to transfer deliveries and garbage collection to this location however a simple management plan will likely be required to ensure the larger manoeuvring area required for a medium rigid vehicle (8.8 metres as denoted in AS2890.2) is clear from parked cars during scheduled garbage collection times (Appendix 17).

Bus Parking

The two existing bus bays on the Pacific Highway can accommodate up to a total of 4 buses simultaneously. The existing operation shows that this is practically sufficient and the rule of thumb bus provision is for 3 buses at once for a school of 900 students (Appendix 17).

Special Events & Community Use

Special events, such as presentation nights, parent teacher interviews and school plays are likely to be held in the school hall during and after school hours. Additionally, the hall will likely be available for community use outside of school hours.

Parking for these times will be both on site and offsite and prior to construction of the southern car park will mirror existing operation. The only currently anticipated event which would require a high overspill of visitors is the end of year annual presentation. It is assumed that depending on the number of patrons attending, the kerbside parking during these times may extend beyond the regular 200 metre parking zone for schools, and would be acceptable in any case considering the low frequency of occurrence (Appendix 17).

Department of Education Position on Car Parking

NSW Public Works has prepared a submission addressing car parking requirements (Appendix 27). The submission outlines current parking arrangements at the school and that there is no proposed increase in student and staff numbers. The submission states that the proposed car parking arrangement will provide the same capacity as the current formal and informal on site capacity to satisfy Lake Macquarie City Council's parking

requirements. Additionally the formal car parking will be sealed and drained in accordance with Council's Development Control Plan 2014 and AS2890.

Disabled Parking

Implementation of a one-way through drop-off and pick-up area for assisted transport students and for the school's existing 20 seat bus (Toyota Coaster) present improved outcomes in terms of disabled access and child safety.

The DEC parking rate includes one (1) disabled space to be provided on site. The proposed modifications to the existing carpark allow for disabled parking for both a disabled staff vehicle and a disabled visitor vehicle. The existing operation of the school implies that no changes are required (Appendix 17).

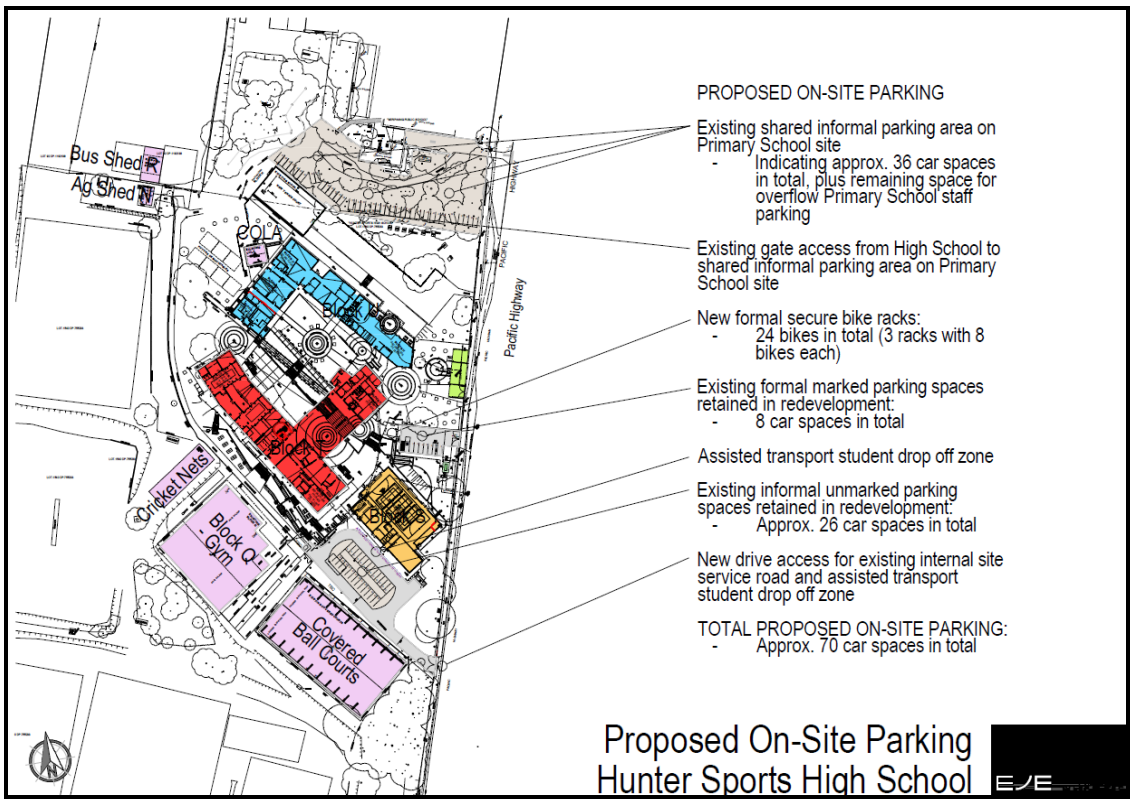

Figure 5 – Proposed On Site Car Parking

6.1.2.3 Traffic Assessment

The expected future behaviour of the local traffic network is as described by the existing operation and Table 6.2. It is anticipated that there will be slightly higher volumes of traffic at the intersection of Pacific Highway/Oakdale Road resulting in approximately double the U-Turn movements currently completed.

The results of the SIDRA analysis for the future performance of the nearby intersection are shown in Table 6.2.

Table 6.2 – Future Intersection Performance

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (seconds/vehicle?	Level of Service[3]	Control Type	Worst Movement
Existing Performance						
Pacific Hwy / Oakdale Rd	PM	1.00	39.1 (62.2)	C (Worst: E)	Signals	Right Turn from Pacific Hwy S
Future Performance (Post-Development)						
Pacific Hwy / Oakdale Rd	PM	1.00	39.2 (62.2)	C (Worst: E)	Signals	Right Turn from Pacific Hwy S

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

As shown in Table 6.2, the increase of U-turn movements at the Pacific Highway / Oakdale Road intersection during the PM peak period has not had any impact on the existing Level of Service and performance of the intersection. Therefore, the proposed development is acceptable in terms of its traffic generation and impact to the surrounding road network.

6.1.2.4 School Accessibility

Driveway Access

At present, the sole driveway access to the site provides vehicular access to all site parking including heavy vehicles such as 20 seater buses, delivery vehicles, staff vehicles and waste collection vehicles. The proposed design includes a 7.5m wide driveway plus splays and a 20m upstream “no parking” zone, which will provide site access for the 20 seater buses, delivery and service vehicles; separate from the proposed staff and visitor vehicle access. The driveway operates safely and efficiently, even at peak traffic times, and the proposed new driveway should be designed in a similar fashion.

Bus Bay

The site has two existing bus zones on the western side of the Pacific Highway and makes frequent use of these in the drop-off and pickup times. The zones can facilitate up to four (4) buses simultaneously and this is considered sufficient based on the size of the school and existing operation. The walking distance to these bus zones will be increased by approximately 175 metres. There is scope in the future to relocate the bus zone and install kerbside parking where the zone currently is, however, neither is necessary nor included as part of this proposal.

Car Parking Access

The proposed driveways serving the on site car parking areas and service areas satisfy location requirements of AS2890.1-2004. Sight distances at these driveways can readily achieve those distances specified in Figure 3.2 of AS2890.1-2004 for the design speed of 60km/h and 40km/h for the frontage local roads.

The proposed southern carpark is near to the U-turn bay on the Pacific Highway at the intersection with Oakdale Road. To ensure safety is achieved at this location it is important to offset the driveway access by an appropriate distance to allow U-turning vehicles to safely enter the stream of traffic and decelerate adequately to enter the driveway. Austroads Guide to Road Design Part 3 Section 5.3 provides the following method of calculation for stopping distance.

Assuming then that a car exits the U-turn bay at 40km/h (during school zone times) to turn into the southern carpark, the reaction time is actually a 3 second decision time of whether to enter the driveway or not and the longitudinal friction factor (d) is the recommended 0.36, then the required stopping distance is 50.8m. The southern car park entrance should therefore be offset from the U-turn bay by at least 51m to be safe and efficient. Outside of school hours there is adequate sight distance from the south for well above 60km/h speeds both for exiting and entering traffic.

The proposal includes separation of parking areas such that the southern carpark is intended for teaching staff, service vehicles and school shuttle buses while the northern carpark is for other staff and occasional school time visitors. The new driveway will operate as a Left IN/Left OUT vehicular access and there is a minimum of 150m sight distance to approaching vehicles. It is not deemed necessary that a dedicated deceleration lane be provided to the new driveway; particularly noting that peak usage occurs during school zone times when the prevailing speed limit is 40km/h.

The internal carparks are for shuttle buses and staff parking only and hence there would not be the influx of parents which could be experienced if pickup/drop-off operations were intended to be completed on site. There is sufficient space on site for the 20 seater buses and staff vehicles such that no propping or queueing would occur beyond the site boundary and the operation is therefore supported.

Servicing

As previously noted, the servicing/loading areas are adequately designed to cater for Small Rigid Vehicles (SRV). No change to existing operation is expected in the short term. If the future yields construction of the southern carpark then some servicing should be moved to this area such as garbage collection and deliveries. It is noted that the gymnasium should have access by emergency and service vehicles at all times even if the remained servicing is completed at the southern carpark.

Emergency Access

Provision is made for emergency vehicle access to the school grounds. Usual practice is to provide the vehicular access directly via the car parking areas and/or directly to open space playing fields. The southern carpark should provide access to emergency vehicles, potentially by use of the whole internal driveway as this is a rare occurrence. Any modifications to the existing carpark should maintain or improve access to the sports field/s by emergency vehicles, particularly ambulances.

6.1.3 Environmental Management Measures

The following environmental management measures are proposed:

- Comply with Traffic and Parking Impact Assessment and Supplementary Information (Appendix 17)
- Driveway to be 7.5 metres wide, plus splays, and a 20 metres upstream no parking zone
- New driveway to operate as a Left IN/Left OUT
- A dedicated deceleration lane is not deemed necessary
- Parent parking should follow the "*Interim Guideline for the Planning and Design of School Traffic and Pedestrian Facilities*" as published by the RMS (formerly Traffic Authority of NSW)
- On site carpark designed in accordance with AS2890.1, AS2890.6 and AS2890.2 except where existing operation supports departure
- Relocate "5 min 8:00-9:30am; 2:30-4:00pm School Days Only" parking zone to start 10m from the proposed southern carpark driveway and extend for 120 metres
- Incorporate access for ambulance and fire service vehicles to all sports fields and parking areas
- Offset of 51m minimum from Pacific Highway U-Turn bay to proposed southern carpark driveway to allow decision and deceleration distance
- Retention of existing bus zones and service arrangements
- Prepare Construction Traffic Management Plan as part of the Construction Environment Management Plan to manage traffic during construction.

6.2 Soils, Geology and Contamination

6.2.1 Existing Environment

Geotechnical

The site is located in a Mine Subsidence District. Conditional approval has been granted by the Mine Subsidence Board (Appendix 7).

A Report on Geotechnical Investigation (Appendix 12), Preliminary Site Investigation (Contamination) (Appendix 13) and Report on Targeted Site Investigation for Contamination (Appendix 13) summarise the existing situation and potential impact of the redevelopment.

Reference to the 1:31,680 Surface Geology of the Newcastle Coalfield geological map indicates that the majority of the school site is underlain by the Permian aged Kahibah Formation of the Adamstown subgroup of the Newcastle Coal Measures. The Kahibah Formation typically comprises conglomerate, sandstone, siltstone, coal and tuff.

The Montrose Coal Seam is shown to outcrop to the north-west of the site. Previous work in the Gateshead area indicates that the Montrose Coal Seam is sometimes associated with shallow groundwater which can also be under artesian pressure. The conditions encountered in the geotechnical investigation were generally consistent with the geotechnical mapping.

Reference to the Acid Sulfate Soil Risk Map for Wallsend prepared by the Department of Land & Water Conservation indicates that the site is in an area of no known occurrence of acid sulfate soils.

According to Douglas Partners (Appendix 13) the site is underlain by carbonaceous clays (completely weathered coal). Based on previous geotechnical investigations the geotechnical conditions are:

- variable depth to rock
- presence of coal seams
- presence of carbonaceous clay layers
- groundwater.

Contamination

The site is contaminated by previous activities and includes buildings that contain asbestos. A Preliminary Site Investigation was prepared by Douglas Partners (Appendix 13). The report found that potential for gross contamination at the site is low with some occurrence of Potential Asbestos Containing Materials, minor quantities of fuels and chemicals and potential PCB contamination associated with the former substation.

Douglas Partners prepared a Targeted Site Investigation for Contamination (Appendix 13). A summary of site features includes:

- former substation area in the central-eastern portion of the site
- former location of bus shed (Building M) in the eastern portion of the site
- former location of dome structure (Building G) in the central-eastern portion of the site
- asphalt paved area between Block B and L (i.e. area of demolition of former structures)
- storage shed on the western side of Block F, which included storage of small quantities of chemical, paints and fuels
- fill and fibro fragments at the surface adjacent to Blocks F and L
- filling at the southern/south-western extents of playing fields
- fibro fragments observed at the surface across the site.

A total of 19 soil samples (including two replicate soil samples) and six material samples (fibro sheeting fragments) were selected to provide an assessment of soil/fill conditions. The samples were selected to target the identified potential sources of contamination and were analysed for some or all of the following potential contaminants:

- Total Recoverable Hydrocarbons (TRH)
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Polychlorinated Aromatic Hydrocarbons (PAH)

- Organochloride and Organophosphorus Pesticides (OCP/OPP)
- Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn, Mn, Fe)
- Asbestos identification.

In addition to the above testing, selected soil samples were analysed for leachability using the following methods:

- Toxicity Characteristic Leaching Procedure (TCLP) for assessment of leachable characteristics for waste classification
- Australian Standard Leaching Procedure (ASLP) for assessment of leaching characteristics in water, for assessment of possible on site management of contaminated soils.

Subsurface investigation identified fill materials across the site with minor soil impacts. Results of the subsurface investigation and laboratory testing indicated the following:

- presence of localised lead impact in filling at one location (Bore 214), likely to be attributed to particulate metal in the sample
- presence of localised hydrocarbon impact in filling at one location (Bore 204), likely to be attributed to the overlying asphalt pavement
- presence of localised and margin benzo(a)pyrene impact in filling at one location (Bore 203)
- presence of building rubble in filling at several locations, including asbestos containing materials in near surface filling and at the surface in several areas of the site.

6.2.2 Potential Environmental Impact

Geotechnical

The site classification in the area of the proposed two and three storey buildings is generally considered to be commensurate with a Class M classification, with the exception of the area of the proposed building over the COLA which is Class P due to 2 metre depth of filling encountered in Bore 105. Provided all the footings are founded in natural material below the filling, it is suggested that reactive soil movements commensurate with a Class M site should be accommodated in design.

The site classification given above is for normal seasonal moisture fluctuations without the influence of trees. It is noted that there were some trees on parts of the school site. The presence of the trees can increase the soil suction and therefore increase reactive clay movement. Removal of the trees prior to construction and the associated suction change is expected to result in swell movements that are additional to the characteristic surface movements. Reference should be made to AS2870-2011, Appendix CH (of Appendix 12) or guidance on design of footings to take into account the presence of existing or proposed trees.

Founding conditions are expected to range from bedrock to generally stiff to very stiff clay and silty clay. The Geotechnical Investigation (Appendix 12) provides comment on excavation and batters, retaining walls, pavement design and subgrade preparation.

Contamination

According to the Targeted Site Investigation for Contamination prepared by Douglas Partners (Appendix 13) the site is considered to be generally suitable for the proposed development, subject to remediation as follows:

- remediation of identified surface asbestos contamination, with subsequent site clearance by an appropriately qualified consultant. This remediation should be done as an immediate interim management measure, prior to the commencement of further works at the site (NSW Department of Education has advised that visible surface material has been collected by a contractor)
- remediation and/or management of filling containing elevated metal, non-volatile hydrocarbon concentrations and asbestos impact. The impacted filling was generally encountered within the top 1metre to 2 metres of the soil profile. Remediation options generally include excavation and off site disposal, or on site management of impacted soils.

If fill materials are required to be removed from site as part of construction works, a preliminary classification of 'General Solid Waste' for general filling, or 'General Solid Waste' with bonded asbestos materials (Special Waste)

will apply, depending on the presence of asbestos impact. Further detailed investigation and testing for waste classification, however, are recommended for confirmation.

It is recommended that the presence and extent of identified impacts within the proposed development area is further assessed following demolition of site structures which currently cover a significant portion of the development area.

It is noted that fill materials are likely present across the school playing fields. The potential for contamination within filling has been identified within the site. These areas should be included in ongoing long term site management as a precautionary measure.

Site remediation and management will be conducted in accordance with the Remediation Action Plan (Appendix 31) that is summarised below:

The Remediation Action Plan defines the site as those areas of proposed development, including associated access, driveways and infrastructure, plus any ancillary areas to be disturbed as part of construction works. Procedures presented in the Remediation Action Plan are not expected to be required outside milestone areas as presented in Appendix B of Appendix 31). It is noted that fill materials are likely to be present across the school playing fields and it is recommended that these areas be included in ongoing long term site management as a precautionary measure.

A Conceptual Site Model has been prepared with reference to the National Environment Protection (Assessment of Site Contamination) Measure 1999. The Conceptual Site Model (Table 1 of Appendix 31) identifies potential contaminant sources and contaminants of concern, contaminant release mechanisms, exposure pathways and potential receptors. A number of remediation options were considered:

- No action
- Off site disposal of contaminated soils to a licensed landfill
- On site treatment and re-use (volatile hydrocarbon impacted soils only)
- On site management (i.e. containment) of contaminated soils
- A combination of Options 2 and 4.

On site management of contaminated soils is considered to be a feasible remediation option to protect human health and the environment and minimise constraints on the future use of the site.

Remediation Goals

The main objective of the remediation programme will be to place contaminated soils beneath a suitable capping layer of concrete slab / pavement to prevent exposure and accessibility. Any excess material requiring off site disposal should be classified with reference to NSW EPA Waste Classification Guidelines (2014) and disposed to a licensed facility.

Additionally, the following measures should occur in the construction capping layer within the development area.

- Placement of a geofabric layer on top of the contaminated fill materials to act as a warning / marker layer and to provide separation from overlying materials (plastic sheeting may be used as an alternative layer beneath concrete slabs)
- Preparation of a long term Site Management Plan to outline precautionary management procedures to be adopted if the permanent capping layer is breached in future. The Site Management Plan will also promote awareness of the contamination management and the requirement of avoiding disturbance to the capping where possible.

Remediation Acceptance Criteria

Achievement of the objective of capping and containment of the asbestos, polycyclic aromatic hydrocarbons and total recoverable hydrocarbons contamination identified within the proposed development area will be demonstrated by successful construction of the capping layer. The Remediation Acceptance Criteria for contained soils will be deemed to have been attained when the capping has been successfully installed.

Imported fill used to reinstate site excavations, raise site levels (if required) and in pavement or landscape areas should be classified as Virgin Excavation Natural Material (VENM) or Excavation Natural Material (ENM) and

should be accompanied by a certificate from the supplier, otherwise detailed assessment (including analysis of representative samples) will be required prior to use on site.

Where remediation / validation of parts of the site are considered, the Remediation Acceptance Criteria for soils remaining on site with respect to the proposed land use and identified contaminants are provided in Table 2 and Section 6.2 of Appendix 31. It is considered that validation analysis should focus on identified areas of concern and associated contamination; however, to provide for contingency situations Remediation Acceptance Criteria have been established for other contaminants (if required) (Table 2 of Appendix 31).

It is noted that with exception of localised asbestos, polycyclic aromatic hydrocarbons and total recoverable hydrocarbons contamination within the development area, the soil investigation results provided Tables 5 to 8 (Appendix 13) meet the adopted Remediation Acceptance Criteria.

Sequence of Remediation

Table 3 of Appendix 31 presents construction milestones and summarises activities within each milestone that require remediation actions based on excavation / disturbance of contaminated soils in the development area. The following remediation methodology is recommended to achieve the remediation goals:

1. Client/Contractor obtains all necessary approvals and notifications to allow commencement of the works, including Department of Planning & Environment approvals and Work Cover NSW permit for asbestos related works (i.e. excavation, handling, placement and capping of soils containing possible asbestos containing material). The contractor should hold the relevant licenses/approvals as a precaution for any asbestos related works

2. Inception meeting between the client, contractor, occupational hygienist and environmental consultant to confirm responsibilities and procedures for remediation and construction

3. Additional investigation of polycyclic aromatic hydrocarbons and total recoverable hydrocarbons impacted soils identified within the proposed building footprint of development area Block T to delineate the extent and determine volume of material to be placed under the capping layer if suitable, see Section 9.2 (of Appendix 31)

4. Co-ordinate excavations for service trenches (i.e. drainage / stormwater) in the north-eastern potion of development area Block T so that excess trench spoil (contaminated soils) can be utilised beneath capping if suitable. Contaminated trench spoil should not be re-used within service trenches

5. Prior to capping, the site surface should be surveyed by a registered surveyor to confirm that appropriate levels have been achieved (i.e. to allow design finished levels for concrete slabs and pavements. Construction of building pad and pavements should only commence once appropriate levels have been achieved

6. Following survey confirmation of site levels, place a geofabric marker/separation layer (Bidim A34 or similar) over the placed materials across the site. Plastic sheeting could be utilised immediately beneath concrete floor slabs or concrete pavements in lieu of the geofabric

7. Excess soils excavated from within the site that cannot be accommodated beneath capping will require the following:

- Temporary stockpiling
- Sampling and analysis to confirm waste classification in accordance with EPA guidelines for off site disposal to a licenced landfill
- Appropriate off-site disposal by a licenced contractor

8. At the completion of capping, a validation inspection should be conducted by a suitably qualified environmental consultant to confirm that appropriate capping has been achieved in accordance with the Remediation Action Plan (Appendix 31)

9. Upon the completion of capping, a suitably qualified environmental consultant should prepare a Remediation and Validation report that will be finalised following the completion of construction. A long term Site Management Plan would be required at the completion of construction for Department of Planning and Environment review and approval and in order for Lake Macquarie City Council to update

the S149 certificate for the site. The Site Management Plan will be limited to the development area (i.e. building and associated pavements). A separate Site Management Plan will be prepared for the greater school grounds, including landscape areas to manage soils across the greater school site.

It is recommended that contaminated soils be placed beneath capping of one designated building footprint (e.g. Block T) to minimise notifications on the S149 certificate.

Due regard should be given to the geotechnical requirements for site development so that site works are compatible with remediation requirements. Staged construction should be conducted, including work outside school hours (where practical) in order to minimise potential exposure/risks to site users.

It is noted that the above procedure is not prescriptive and the contractor should confirm the construction process that will achieve the objectives of remediation in a practical and economical manner, with due regard to WHS. This procedure should be presented in the CEMP for the work. Should remediation and validation of contamination outside the development area be required during works, consideration should be given to management of the identified additional contamination beneath pavements/buildings and/or filling within the milestone areas as part of the proposed works.

Previous investigations within the southern portion of the site and north-eastern portion of the site identified lead (south) and polycyclic aromatic hydrocarbons and total recoverable hydrocarbons (north-east, Block T development area) impact in filling. Additional investigation is recommended to delineate the extent of impacted soils and confirm the suitability for on-site management of contaminated soils and aid the assessment and likely volumes. The scope of work for additional investigations is provided in Section 9.2 of Appendix 31.

As asbestos material identified on the site was generally in the form of fragments or bundles of fibre cement sheet, there is a low risk of asbestos fibres becoming airborne. However, as a precaution air monitoring will be conducted by the occupational hygienist during remediation. Management measures regarding air monitoring will be included in the contractors CEMP (i.e. additional management measures, stop work etc). There is potential that movement of vehicles may result in off site emissions of waste. Appropriate traffic management is required to control and track waste removed from the site and minimise potential for loss of contaminated soil and other waste from the site.

Erosion and Sediment

Excavations proposed within the proposed building footprint of 'Block T' and 'Block U' are shown in the client supplied excavation plan in Appendix B. Based on information supplied by the client, the cut excavation within 'Block T' (southern shaded area as shown on the attached excavation plan) will be approximately 600m^2 in area, approximately 2.2 metres depth below ground level and will generate approximately 1,300m^3 of material. The cut excavation within 'Block U' T' (northern shaded area as shown on the attached excavation plan) will be approximately 135m^2 in area, approximately 2.2 metre depth below ground level and will generate approximately 300m^3 of spoil (Appendix 31).

Construction has potential to result in erosion and subsequent loss of topsoil. Excess soil from construction will need to be managed on site or disposed off site. Excess soil will need to be managed to ensure it is not lost into previously undisturbed areas or into adjacent land. A designated stockpile location will be required at the construction compound. As shown in Appendix C of Appendix 14 the construction compound will be located on the south eastern portion of the site and will move throughout construction to minimise impact to operation of the school.

It is proposed to reuse excavated material within the site; however greater detail will be provided through the construction phase. Reuse of excavated material will be subject the Remedial Action Plan (Appendix 31).

Mine Subsidence

The site is located in a Mine Subsidence District. Conditional approval has been granted by the Mine Subsidence Board (Appendix 7).

6.2.3 Environmental Management Measures

The following environmental management measures are proposed:

- Comply with conditional approval of Mine Subsidence Board dated 22 January 2016

- Construction to comply with requirements of the Report on Geotechnical Investigation, Douglas Partners, October 2015 including excavation and batters, retaining walls and subgrade preparation
- No person will be permitted to enter an unsupported excavation where it is more than 1.5 metres deep or where it is considered to be unstable, irrespective of depth
- Site remediation and management will be conducted in accordance with the Remediation Action Plan (Appendix 31)
- Staged construction will be conducted, including work outside school hours (where practical) in order to minimise potential exposure/risks to site users
- Imported fill used to reinstate site excavations, raise site levels (if required) and in pavement or landscape areas should be classified as Virgin Excavation Natural Material (VENM) or Excavation Natural Material (ENM)
- Records of all imported filling and placement should also be maintained by the contractor
- Additional investigation for contamination will also occur following demolition of site structures in order to confirm remediation requirements
- Additional investigation will occur to delineate the extent of impacted soils and confirm the suitability for on site management of contaminated soils and aid the assessment and likely volumes
- Materials requiring off-site disposal must be classified in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014)
- Asbestos contaminated soil/fill from the development area that cannot be accommodated under capping will require disposal to a licensed landfill as 'special waste' in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014)
- Classification of materials for off-site disposal will include inspection, sampling and analysis at generally not less than one per 25m^3. The frequency of testing required for classification should be confirmed by a suitably qualified environmental consultant, and will depend on the volume and consistency of the material
- Appropriate tracking of the excess soils should be conducted by the licenced contractor
- Contaminated material should be stockpiled at suitable locations within the site. All stockpiles of contaminated material shall be appropriately fenced and demarcated to clearly delineate their boundaries. Stockpiles shall be lightly conditioned by water sprinkler and covered by geotextile or similar cover to prevent dust blow. Geotextile silt fences or hay bales should be erected around each stockpile to prevent losses by surface erosion where required or sediment run-off. The location and quantity of stockpiled contaminated soils should be recorded by the contactor
- If temporary stockpiling is required outside 'the site' area or within the site following capping, stockpiles should be placed over plastic to minimise cross-contamination with underlying soils. The footprint of such stockpiles should also be validated via inspection and testing following removal
- The following procedure is recommended for the loading and transport of contaminated materials from the site (if required):
    - Transport of contaminated material off the site should be via a clearly demarcated haul route
    - Removal of waste materials from the site should only be carried out by an experienced contractor holding appropriate licences, consents and approvals
    - Details of all contaminated materials removed from the site should be documented by the contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate). Such information should be provided to the environmental consultant responsible for site validation for reporting purposes
    - Measures should be implemented to minimise the potential for contaminated material to be spilled onto public roadways or tracked off-site on vehicle wheels

- In the event that contamination is found to be migrating along preferential pathways (e.g. observed staining/odours within service trenches and conduits), the following contingency procedure will be adopted:
- Remedial excavations will be continued in the direction of migration to the practical extent possible (without causing damage to infrastructure) as directed by the structural engineer (it is anticipated that the extent to which impacted materials can be chased-out along service conduits would be limited due to structural elements and services) and site boundaries
- If impacted materials are present at the practical limits of the remedial excavation, validation samples will be collected and analysed per the requirements of Section 10.1 (of Appendix 31) to determine the degree of residual contamination present
- If concentrations of residual contaminants at the practical extent of the remedial excavation exceed the landuse criteria then the following additional contingencies may be adopted:
    - Site specific risk assessment will be undertaken to determine the actual level of risk to human health
    - Groundwater monitoring wells/soil bores will be considered (if feasible) hydraulically down gradient of the observed impacted material/preferential pathway to attempt to define extent and degree of preferential migration
    - Based on the results of the above, additional management controls and/or groundwater remediation measures may be required
- The environmental consultant responsible for site validation should assess sampling accuracy and precision
- A validation report will be prepared by a suitably qualified environmental consultant including inspection to confirm that appropriate capping has been achieved in accordance with the Remediation Action Plan
- A long term Site Management Plan will be prepared at completion of remediation works to promote awareness of contamination management and requirements to avoid disturbance (where possible). The Site Management Plan will be in accordance with the Remediation Action Plan (Appendix 31) and noted on the Section 149 certificate
- A WorkCover NSW asbestos removal work licence under the Work Health and Safety Regulation 2011 will be issued and complied with, including appropriate notification prior to commencement
- 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 "The Blue Book",* Landcom (2004) and Aurecon plan (Appendix 14) with regard to recommendations of Douglas Partners Report on Targeted Site Investigation for Contamination (Appendix 13) and Remediation Action Plan (Appendix 31)
- Appropriate measures will be taken to minimise the potential for potentially contaminated water or sediments to leave the site. Such measures could include:
    - Construction of diversion bunds to divert stormwater from contaminated areas and contaminated
    - soil stockpiles
    - Provision of sediment traps including geotextiles or hay bales. This would be required for contaminated soil stockpiles to prevent losses by surface erosio
    - Construction of sediment control basins (if required)
- Discharge of any waters should meet the consent conditions from the appropriate authority. This will be verified by sampling and analyses undertaken by the contractor
- If gross soil contamination is identified on site during remediation works, the materials should be appropriately investigated by a suitably qualified environmental consultant and either managed on site (if appropriate) or disposed off-site to a licenced landfill following classification

- Prepare contingency procedures including incident management and unexpected finds protocol (refer to Section 9.9 of Appendix 31)
- Playing fields will be included in ongoing long term site management as a precautionary measure
- Construction and ongoing use of the site will be in accordance with the Remediation Action Plan, including Section 7 – Responsibilities (Appendix 31)
- The contractor is responsible that the site works comply with the following conditions:
    - Wastes generated at the site are disposed in an appropriate manner
    - Fugitive dust leaving the confines of the site is minimised. As a precaution, air monitoring will be conducted at the boundaries of the site to monitor the presence of airborne asbestos fibres
    - No water containing any suspended matter or contaminants leaves the site in a manner which could pollute the environment
    - Vehicles shall be cleaned and secured so that no mud, soil or water are deposited on any public roadways or adjacent areas
    - Noise and vibration levels at the site boundaries comply with the legislative requirements
- Appropriate air monitoring will be conducted by the occupational hygienist during remediation. Management measures regarding air monitoring will be established (i.e. additional management measures, stop work etc)
- All vehicular traffic shall use only routes approved by Council, to and from the selected landfill where off-site disposal is undertaken. The proposed landfill should be consulted for any additional requirements
- All loads shall be tarpaulin covered and lightly wetted to minimise the potential for materials or dust are dropped or deposited outside or within the site
- Each vehicle that has trafficked potentially impacted site soils within the site shall be inspected for cleanliness before being logged out as clean (wheels and chassis), or hosed down into a wheel wash or wash down bay (located at the site exit) until designated as clean when exiting the site
- Wheel wash silt residues should be collected periodically and either returned to the excavation area or included in the remediation stockpile. Such material will be treated as contaminated unless analysis proves otherwise
- Removal of waste materials from the site shall only be carried out by a licensed contractor holding appropriate licence, consent or approvals to dispose the waste materials according to the classification
- Waste tracking should be conducted by the licensed contractor in accordance with regulatory requirements. Details of all materials removed from the site shall be documented by a contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate) provided to the environmental consultant responsible for site validation. A site log shall be maintained by the contractor to track disposed loads against on-site origin and location of the materials
- Truck dispatch shall be logged and recorded by the contractor for each load leaving the site. A record of the truck dispatch should be provided to the environmental consultant responsible for site validation by the contractor
- Similarly tracking and documentation of all on site movements of material should be maintained by the contractor
- Prior to demolition a Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition and determine any additional controls required to ensure safety of students, staff and visitors.

6.3 Water Quality and Flooding

6.3.1 Existing Environment

The study area is located within the Jewells Swamp catchment, a small catchment on the eastern side of Lake Macquarie within the Lake Macquarie LGA. The study area is drained by Johnsons Creek to the west, a second order stream that flows south-easterly into Jewells Swamp via Scrubby Creek. The wetland is drained by Crokers Creek that enters the Pacific Ocean at Nine Mile Beach, Redhead. No identified streams or watercourses flow through the study area itself. Jewells Swamp is a wetland listed by SEPP 14; therefore the study area is within the catchment of a SEPP 14 wetland (Appendix 11).

Johnsons Creek forms the western and southern boundary of the school site. Johnsons Creek forms part of the Jewells Wetland catchment. The total site area is approximately 91,055m^2. Stormwater management currently includes a below ground piped stormwater system that discharges to Johnsons Creek to the south west.

According to Appendix 1, a new Gymnasium complex was built in 2010 which provided a 60kL rainwater tank for irrigation reuse on the site. Additionally, this development is connected to an on site detention system providing 55 cumecs of below ground storage.

The geotechnical report (Appendix 12) found free groundwater was observed in Bores 101 and 103 at depths of 1.2 m and 2.9 m respectively (approximately RL 26.1 m to 22.6 m AHD, respectively). No free groundwater was observed in Bores 105 to 107 whilst auguring. The use of drilling fluids below the augured depths at Bores 102 and 104 precluded the observation of groundwater. It should be noted that groundwater levels are affected by factors such as recent weather conditions and soil permeability and will vary with time.

Bureau of Meteorology data indicates that the mean monthly rainfall ranges from 55.9mm (August) to 159.8mm (February) (Edgeworth WWTP approximately 8.6 km away). Mean monthly rainfalls are outlined in Table 6.3.

Table 6.3 – Mean Monthly Rainfall (millimetres)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
99.0	159.8	113.7	132.5	104.6	116.0	58.5	55.9	63.7	65.6	100.9	88.2

As shown in Table 6.3 higher rainfall occurs during warmer months. As construction will occur over a two year period there is limited option to avoid periods of heavier rainfall. Erosion and sediment control will be required to adapt during periods of rainfall and minimise storage of soil and construction

6.3.2 Potential Environmental Impact

6.3.2.1 Groundwater

The development is unlikely to require extraction of significant amounts of groundwater. However, if during construction more than 3 Ml of groundwater is proposed to be extracted an approval/license is required from the NSW Office of Water.

6.3.2.2 Flooding

The site is considered a flood control lot – low hazard (Appendix 15). A stormwater management plan (Appendix 14) found major stormwater flows from rainfall events up to a 100 year ARI cannot be accommodated by the below ground pipe network and will be conveyed on the surface via overland flow along the line of the below ground system. Piped flows will pass through the detention system prior to discharge. Bypass flows will travel over the surface and dissipate onto the playing fields to the south western part of the site adjacent to Johnsons Creek.

Aurecon has advised the following:

The school has a natural surface fall from North to South across the site. Any current stormwater surface flow is physically intersected by existing blocks D, E & J that run from East to West at the top of the school site. The water flows are then picked up by pits and conveyed via a below ground piped stormwater system through the site and to the outlet into Johnsons creek to the Southwest of the site.

In the proposed development, existing blocks D, E & J are being removed and replaced by Block U which also runs East to West and perpendicular to the natural surface fall. The proposed stormwater system has been designed to replicate the existing and pick up all surface flows intersected by the building and convey the flows via a below ground piped system to a new detention tank.

The proposed development floor levels have been designed to follow the fall of the existing site as much as practicable. The stormwater system has been designed to accommodate these levels and capture water from all areas of the new works. As a result, and as filling will not be required to the Northern section of Block U, there will be no additional impediments to the movement of surface and groundwater flows across the site.

As set out in the stormwater management plan, the proposed stormwater system has been designed to ensure that post developed flows leaving the site will be less than the existing pre developed flows. This will be achieved by routing the stormwater flows through a detention tank which will throttle the peak flows and release them gradually. As a result, in most design storm events, the flows leaving the site will be significantly lower than the existing flows.

The Jewells Wetland Flood Study 2013 (JWFS2013) shows that the 100yr flood extent in Johnson's creek does not encroach within the school boundaries. The outlet point for the school stormwater system discharges into Johnson's creek at around RL 18.0, whereas JWFS2013 shows the 100yr flood level at the same location is approximately RL 17.0.

As the post developed flows leaving the site will not exceed existing flows, and the 100yr flood extent is below the level of the site discharge point, it can be seen that the proposed development will have no adverse impact on flooding within or external to the site.

6.3.2.3 Stormwater

A stormwater management plan (Appendix 14) presents the proposed stormwater management system that is summarised below.

Minor Drainage

The piped minor drainage system will be designed to accommodate the 1 in 20yr flows and will be distributed throughout the development to capture flows from roof downpipes along with landscaped and paved surfaces. All stormwater pipes will be directed to an onsite detention tank located adjacent to Block T and to the North of the existing service roadway. This system is documented on the Civil Stormwater Plan CV-001 provided in Appendix A (of Appendix 14).

Due to the recent additions to the site and the large areas of playing fields, only the area to the North of the existing service road has been included in the current stormwater analysis for the proposed development (as agreed with Mr Greg Field from Lake Macquarie City Council). This area captures the full extent of the proposed new works.

Note that the existing stormwater system below the service road will be retained unaltered. This area includes the following:

- Existing below ground piped drainage system discharging into Johnsons Creek to the western boundary of the site
- Existing rainwater collection tank (60kL) attached to the Gymnasium roof (currently not in use)
- Existing below ground detention tanks (45kL & 10kL) adjacent to the Gymnasium
- Overland flow paths directing surface flows towards the Southwestern boundary along pipe drainage routes.

Major Drainage

The major stormwater flows from rainfall events up to a 100 year ARI that cannot be accommodated by the below ground pipe network will be conveyed through the new development on the surface via overland flow along the line of the below ground system. Piped flows will pass through the detention system and discharge at the rates as below. Bypass flows unable to be directed to, and accommodated by the tank will be intercepted by the existing kerbed access road to the South of the new works. Flows will be directed by formed kerbs to the pit at the low point of the road where it will be detained until it is either empties through the piped network, or overflows into the above ground drainage swales. In both cases the water will be directed to the existing discharge point in the Southwestern part of the site adjacent to Johnsons Creek.

Detention Storage

A volume of detention storage will be provided appropriate to store peak flows from the proposed new development and limit discharges such that post developed flows will be limited to the pre developed flow for all storm events. All outflows from the detention tank will be discharged through the existing stormwater system to Johnsons Creek.

Note that as there has been a nett decrease in the impervious area with the proposed new development, the Post developed flows will actually be slightly less than the Pre developed flows. Whilst this satisfies the Lake Macquarie City Council requirements, an on site detention (OSD) tank has been adopted in the proposed system to further manage major storm events by storing peak inflows and releasing them at rates able to be managed by the piped system. This will both restrict the site flows from all storms in the Post developed case, and improve safety by minimizing any surface overflows during major storm events. The analysis of the upper school catchment and detention system has been carried out using the DRAINS software. The upper catchment was modelling for the predeveloped case to determine existing site flows, and then the post developed case was modelled using a detention storage which was adjusted to ensure the peak outflows were able to be conveyed from the tank with no overflows.

Table 6.4 – Storage and Discharge from Detention Tank

Storm ARI	Storage Required m^3	Site Discharge – Pre-Development (L/s)	Site Discharge – Post-Development (L/s)	Over Flows from Detention Tank (L/s)
2	38.9	54	44	0
5	39.6	75	45	0
20	40.4	102	45	0
100	44.3	124	52	0

Note: High Early Discharge weir at RL 1m

Stormwater Quality Improvement and Reuse

All new stormwater pits on the site will incorporate EnviroPod™ 200micron filter inserts to remove contaminants from the stormwater by the mechanism of direct screening. The inserts act as a Gross Pollutant Trap and allow for pollutants and coarse sediments to be captured at the source. Given the educational nature of the development, it is anticipated that litter will be the primary pollutant which will be captured at the pit and not allowed to be transmitted through the system to the outfall. Additional Oil Absorbent Media pouches are also specified to new pits in trafficable areas. These pouches will capture first flush oil and grease deposits to improve the water quality at the source.

It is also proposed that the out of service rainwater tank connected to the Gymnasium will be recommissioned. The water will be reused for the main building toilet flushing and for irrigation of the new landscaped areas. (Note that the recycled rainwater is not proposed to be used to irrigate the existing playing fields).

The Biodiversity Assessment Report (Appendix 11) found indirect impacts could occur on the SEPP 14 wetland to the south-east of the study area as a result of siltation, sedimentation and unmitigated runoff if adequate controls are not implemented during and following construction. It is expected that standard mitigation measures will address the potential for such indirect impacts as part of the construction protocols and stormwater management structures implemented as part of the proposal.

Erosion and Sediment

Construction has potential to result in erosion and subsequent loss of topsoil. Excess soil from construction will need to be managed on site or disposed off site. It is proposed to reuse excavated material within the site; however greater detail will be provided through the construction phase. Reuse of excavated material will be in accordance with the Remediation Action Plan (Appendix 31).

Erosion and sediment controls will be required during the construction phase to capture, control and treat sediment laden water leaving the site. Sediment and erosion controls will consist of various sediment control elements installed around the lower extents of the works, and will include:

- Stabilised entry/exit point consisting of large diameter crushed rock pad that is approximately 5 metres by 3 metres.
- Sediment fences along lower edges
- Stormwater pit protection barriers
- Designated material stockpile locations (Appendix 14).

As the works are to be broken up into milestones, the erosion and sediment control measures will need to be moved to suit the disturbed construction areas relative to the current milestone. As the post developed flows are being reduced from pre developed flow, and the discharges are being conveyed via the existing piped network, it is not proposed to carry out any works at the site discharge point near Johnson's creek, nor any below the existing service road. Additionally, due to this flow reduction, it is not expected that any detrimental effects such as erosion will occur at the site discharge point and there are unlikely to be any impacts to Johnson's creek as a result of the development (Appendix 14).

The site contains contaminated soil (Appendix 31) that may be discharged off site during construction. According to the Remediation Action Plan (Appendix 31) appropriate measures to minimise the potential for potentially contaminated water or sediments to leave the site could include:

- Construction of diversion bunds to divert stormwater from contaminated areas and contaminated soil stockpiles
- Provision of sediment traps including geotextiles or hay bales. This would be required for contaminated soil stockpiles to prevent losses by surface erosion
- Construction of sediment control basins (if required)

Discharge of any waters should meet the consent conditions from the appropriate authority. This should be verified by sampling and analyses undertaken by the contractor. For example, if excavations fill with water during validation works (i.e. due to rainfall), the water will require analysis to determine appropriate options for discharge (i.e. disposal to stormwater, sewer or collection by a licensed contractor). Should construction of a sediment pond be required during construction, the pond should be assessed for contamination and validated following decommissioning.

6.3.2.4 Potable Water

The hydraulic design for the project includes specification of the most efficient sanitary fixtures and tapware based on the current Water Efficiency Labelling and Standards Scheme (WELS), exceeding both the minimum requirements of AS3600 and the Education Facilities Standards and Guidelines (EFSG).

The minimum WELS rating of both sanitary fixtures and tapware to comply with AS6400 requirements is 1 star, with a maximum star rating of 3 stars for showers and 6 star for tap outlets, urinals and toilets of which has been specified. The current EFSG minimum requirements for sanitary fixtures and tapware efficiency are as follows:

- Basins, sinks and bubblers - 5 Star
- Showers - 3 Star
- Toilets and urinals - 4 Star

Specified sanitary fixtures and tapware efficiency will be as follows:

- Basins, sinks, bubblers and urinals - 6 Star
- Showers - 3 Star
- Toilets - 5 Star

The hydraulic design for the redevelopment includes a comprehensive rainwater re-use system supplying non-potable water to the main amenity areas for toilet flushing and will also supply all new hose taps and irrigation systems to landscaped areas. The system includes two rain water tanks with a combined capacity of 75KL supplied by the existing Block M and Northern most Cola Roof catchments, this system is additional to any local authority requirements and has been included to reduce the demand on potable drinking water supplies.

6.3.3 Environmental Management Measures

The following environmental management measures will be implemented:

- 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 "The Blue Book",* Landcom (2004) and Aurecon plan (Appendix 14) with regard to recommendations of Douglas Partners Report on Targeted Site Investigation for Contamination (Appendix 13)
- Appropriate measures provided in the Remediation Action Plan (Appendix 31) taken to minimise potential for potentially contaminated water or sediments to leave the site could include:
    - Use of a water cart, as and when appropriate, to eliminate wind-blown dust
    - Use of sprays/sprinklers to prevent dust blow from stockpiles
    - Covering of stockpiles with plastic sheeting or geotextile membranes
    - Restriction of stockpile heights to 2 m above surrounding site level
    - Ceasing works during periods of inclement weather such as high winds or heavy rain
    - Regular checking of the fugitive dust and odour issues. Undertake immediate remediation measures to rectify any cases of excessive dust or odour
    - Provision of temporary capping over site soils such as the contractor staging area
- Stormwater management will be in accordance with Stormwater Management Plan prepared by Aurecon (Appendix 14)
- Stormwater management will be staged in accordance with construction milestones (Appendix 23)
- All new stormwater pits on the site will incorporate EnviroPod™ 200micron filter inserts and maintained in accordance with manufacturers requirements
- 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 (Appendix 14)
- Potable water reuse and efficient water saving equipment will be provided in accordance with Section 6.2.3 of this EIS
- A groundwater management plan will be included in the CEMP to minimise potential for erosion and sedimentation and ensure appropriate disposal of groundwater
- If during construction more than 3 Ml of groundwater is proposed to be extracted an approval/license is required from the NSW Office of Water.

6.4 Air quality

6.4.1 Existing Environment

The school has operated at the site since 1959 and there have been no significant air quality incidents as a result of the school. Teacher and student numbers at the school will remain unchanged from current and as such the proposal will not generate additional traffic movements that may impact on air quality.

The grounds are generally built on or landscaped with minimal potential for creation of dust. The existing buildings and grounds contain asbestos.

Air quality in the area is typical of an urban environment. The NSW Air Quality Statement 2015 (OEH, 2016) states in 2015 there were no exceedances of nitrogen dioxide, sulfur dioxide and carbon monoxide standards, with levels remaining well below relevant standards.

While levels of ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide in the Hunter Valley remained below national standards, particle levels in the Hunter Valley did exceed national standards at some stations. Annual average $PM_{2.5}$ levels in Stockton are higher than at other locations in the Hunter Valley. The main sources of $PM_{2.5}$ within the Hunter are combustion related (transport, industry, wood fired heaters, bushfires) and natural (sea salt).

Monitoring at larger population centres in the Hunter Valley during 2015 showed the following:

- All Hunter stations, except Stockton, met the PM_{10} goal of five or less days over the standard
- Annual average PM_{10} levels were below 25µg/m^3 (the new standard) at all stations except Stockton (see below)
- The maximum daily average PM_{10} in the Upper Hunter was 85.3µg/m^3 (Singleton 6 May) and 101.4 µg/m3 in Newcastle (Stockton 4 October)
- Daily average PM_{10} levels were above national standards on eight days at one or more large population centres (excluding Stockton – see below) compared to seven days in 2014
- Levels were above the daily average PM_{10} standard at Stockton on 67 days in 2015, mainly due to sea salt spray under predominant onshore flows in the warmer months
- Levels above the $PM_{2.5}$ daily national standard were recorded on occasion at Beresfield, Carrington, Mayfield, Newcastle, Stockton and Muswellbrook, while Carrington, Stockton and Muswellbrook also recorded $PM_{2.5}$ levels above the annual standard
- Across the Hunter there were nine days during 2015 when daily $PM_{2.5}$ levels exceeded the standard at one or more sites, compared to six days during 2014. In the cooler months, use of wood-fired heaters influences $PM_{2.5}$ levels at upper Hunter sites; elevated $PM_{2.5}$ levels at Stockton were associated with north-westerly winds. Fires in August likely impacted $PM_{2.5}$ levels throughout the region
- A statewide dust storm originating from the Victorian Mallee and south west NSW region contributed to high PM_{10} levels on 6 May. Smoke from a bushfire near Kurri Kurri (RFS2015b) led to elevated PM_{10} levels in the Hunter region on 26 November. High daily $PM_{2.5}$ at Muswellbrook on other days occurred overnight under generally calm conditions, and was most likely from smoke from residential wood fires.

6.4.2 Potential Environmental Impact

As discussed previously, construction will occur over two years in stages. Areas of exposed soil and stockpiles will move progressively during construction. Dust (airborne particulate matter) is identified as being the key air quality issue to be assessed. Emissions will be produced during the construction phase of the proposal. Appropriate dust control during construction will ameliorate potential off site dust emission.

However due to proposed building and landscaping dust is unlikely to be produced during operation of the school. There is low risk of asbestos fibres in contaminated fill becoming airborne (Appendix 31). However, as a precaution air monitoring should be conducted by an occupational hygienist during remediation. Additionally, a Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition and determine any additional controls required to ensure safety of students, staff and visitors. Management measures regarding air monitoring should be included in the contractors CEMP (i.e. additional management measures, stop work etc).

The fume cupboards are currently located in Block J and D of the existing school. The two existing fume cupboards will be relocated when these existing buildings are demolished, and installed within new Science laboratories in the new Block T as part of the redevelopment. The new exhaust system provided for the relocated fume cupboards will comply with all relevant statutory requirements.

Furthermore, additional traffic and associated vehicle emissions will remain unchanged from the current situation once construction is complete and the school is operating.

6.4.3 Environmental Management Measures

The following environmental management measures will be implemented:

Construction Phase

- Prior to demolition a Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition and determine any additional controls required to ensure safety of students, staff and visitors
- Appropriate air monitoring will be conducted by the occupational hygienist during remediation. Management measures regarding air monitoring will be established (i.e. additional management measures, stop work etc)
- 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.

Operational Phase

- Empty outdoor bins at the end of each day
- Maintain landscaping to minimise exposed soil
- Exhaust system provided for the relocated fume cupboards will comply with all relevant statutory requirements.

6.5 Noise

6.5.1 Existing Environment

A Construction Noise and Vibration Management Plan (Appendix 26) has been prepared to quantify noise and vibration emissions from the project to surrounding receivers. Receivers in the locality surrounding the project site are primarily educational, residential and commercial and for assessment purposes have been organised into noise catchments (NCs). Table 1 summarises the surrounding NCs and receiver types.

Figure 6.1 provides a locality plan identifying the position of nearest receiver catchments in relation to the project. For assessment purposes existing or future classroom buildings have been assessed for each activity where relevant, although are not shown in Table 6.5.

Table 6.5 – Sensitive Receivers and Relevant Noise Catchments

Noise Catchment ID	Address	Receiver Category	Distance to Site Boundary[1]
NC1	9 to 21 Pacific Highway	Commercial	55 metres
NC2	25 to 39 Pacific Highway	Commercial	50 metres
NC3	2-6 Macquarie Ave & 1A – 5 The Crescent	Residential	75 metres
NC4	2 to 16 The Crescent	Residential	110 metres
NC5	Wiripaang Public School	Educational	30 metres
NC6	10 to 42 Sydney Street & 54 Goundry Street	Residential	265 metres

Note 1: Approximate distance to nearest project site boundary.

Figure 6.1 – Noise Catchments

6.5.2 Potential Environmental Impact

To quantify the existing background noise environment of the area, unattended noise logging was conducted at 54 Goundry Street (L1) and 2 Macquarie Street (L2), Gateshead, NSW (Figure 6.1). The unattended noise survey was conducted in general accordance with the procedures described in Australian Standard AS 1055-1997, "Acoustics - Description and Measurement of Environmental Noise". Noise monitoring summary is provided in Table 6.6.

Table 6.6 – Background Noise Monitoring Summary

Monitoring Location	Period[1]	Measured Background Noise Level (LA_{90}), RBL dBA	Measured LAeq, dBA
L1	Day	39	58
	Evening	37	51
	Night	29	49
L2	Day	48	61
	Evening	40	59
	Night	33	56

Note 1: Monday to Saturday: Day 7am to 6pm; Evening 6pm to 10pm; Night 10pm to 7am. On Sundays and Public Holidays, Daytime 8am to 6pm; Evening 6pm to 10pm; Night-time 10pm-8am.

Note: excludes periods of wind or rain affected data, meteorological data obtained from the Bureau of Meteorology Nobbys Pilot Station.

Noise Modelling

Brüel and Kjær Predictor Type 7810 (Version 11.00) noise modelling software was used to assess potential noise impacts associated with the proposal. A three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. Where relevant, the construction noise impact assessment has adopted the items of equipment presented in Table 15 (of Appendix 26) and associated noise emission data, as obtained from the MAC noise database.

Construction Noise

The Interim Construction Noise Guideline (ICNG) sets out procedures to identify and address the impacts of construction noise on residences and other sensitive land uses. This section provides a summary of noise objectives that are applicable to the assessment.

The ICNG provides two methodologies for the assessment of construction noise emissions:

- Quantitative, which is suited to major construction projects with typical durations of more than three weeks
- Qualitative, which is suited to short term infrastructure maintenance (<three weeks).

This study has adopted a quantitative assessment approach and includes identification of potentially affected receivers, description of activities involved in the project, derivation of the construction noise criteria, quantification of potential noise impacts at receivers and, provides management and mitigation recommendations.

The three construction periods that are considered in this EIS are:

- Normal construction hours: Monday to Friday 7am to 6pm, Saturday 8am to 1pm , no work on Sundays or public holidays
- Out of hours construction 1: Monday to Friday 6pm to 10 pm, Saturday 7am to 8am and 1pm to 10pm, Sunday or public holidays 8am to 6pm
- Out of hours construction 2: Monday to Friday 10pm to 7am, Saturday 10pm to 8am and Sunday or public holidays 6pm to 7am.

Strong justification is required to work outside of normal construction hours. Activities proposed outside normal construction hours will be considered against the Construction Noise and Vibration Management Plan to ensure compliance. Table 6.7 presents the standard construction period Noise Management Levels for residential and non-residential receivers in close proximity to the project in accordance with the ICNG. For the educational receiver, it may be more practical to assess against an external noise management levels. Therefore, the Noise Management Levels for educational receivers has been adjusted to an external management level assuming 10dB attenuation for a partially open window.

Table 6.7 – ICNG Noise Management Levels

Noise Catchment ID	Receiver Type	Noise Management Level LAeq (15 minute)
NC1	Commercial	70
NC2	Commercial	70
NC3	Residential	68
NC4	Residential	68
NC5	Educational	45 (internal) / 55 (external)
NC6	Residential	49

To minimise construction noise impacts on students and teachers, and to ensure continuity of studies, some activities may need to be completed during out of hours periods. Table 6.8 presents the relevant Noise Management Levels for out of hours periods. It is reiterated that schools or commercial receivers are unlikely to be occupied during the out of hours periods. Hence, only residential receivers have been included in the out of hours assessment (refer to Figure 6.1 for noise catchment).

Table 6.8 – ICNG Out of Hours Noise Management Levels, LAeq (15min)

NC ID	Receiver Type	Period	OOH RBL	Noise Management Lever LAeq (15 min) (RBL + 5dB for OOH periods)
NC3	Residential	Evening (OOH1)	40	45
		Night (OOH2)	33	38
NC4	Residential	Evening (OOH1)	40	45
		Night (OOH2)	33	38
NC5	Residential	Evening (OOH1)	37	42
		Night (OOH2)	30 (29)[1]	35

Note 1: Where the RBL is lower than 30dBA a RBL of 30dBA is applied – the measured RBL is shown in brackets.

Road Noise Policy

The road traffic noise criteria are provided in the NSW EPA's Road Noise Policy (RNP) (2011). The 'Freeway/arterial/sub-arterial road' categories as specified in the RNP are adopted for the Pacific Highway for this assessment which is the primary transportation route of construction vehicles to the project. Table 6.8 presents the road traffic noise assessment criteria reproduced from the RNP relevant for this road type.

Table 6.9 – Road Traffic Noise Assessment Criteria for Residential Land Uses

Road Category	Type of Project / Development	Assessment Criteria – dBA	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway / arterial / sub-arterial road	Existing residences affected by additional traffic on existing freeways / sub-arterial/roads generated by land use developments	60dBA, LAeq(15hr)	55dBA, LAeq(9hr)

Additionally, the RNP states where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2dB, which is generally accepted as the threshold of perceptibility to a change in noise level.

In addition to meeting the assessment criteria, any significant increase in total traffic noise at receivers must be considered. Receivers experiencing increases in total traffic noise levels above those presented in Table 7 (of Appendix 26) due to the addition of construction vehicles on the roads surrounding the project should be considered for mitigation.

Vehicle movements to the project would be from the south and exit to the north via the Pacific Highway. It is anticipated that the maximum workforce on the project would be up to 150 staff per day (i.e. 300movements). Furthermore, this assessment has assumed a conservative volume of up to 25 trucks per day (i.e. 50 movements) that will be required for waste removal and/or delivery of construction materials. The road noise calculations assume that all vehicles travel along the Pacific Highway north past residences that are situated approximately 15m from the road alignment. The results of the traffic noise calculations are presented in Appendix 26 and demonstrate the noise levels from construction traffic would remain below the relevant day criteria for receivers at a distance of 15 metres from the roadway and also satisfy the relevant increase criteria.

Vibration Assessment Guidelines

For structural damage, vibration should be assessed at the foundation of a building or structure. In the absence of an Australian Standard, German Standard DIN 4150 - Part 3: 1999 provides the strictest guideline levels of vibration velocity for evaluating the effects of vibration in structures. The limits presented in this standard are generally recognised to be conservative. The DIN 4150 values (maximum levels measured in any direction at the foundation, or maximum levels measured in (x) or (y) horizontal directions, in the plane of the uppermost floor), are summarised in Table 8 (of Appendix 26).

Humans are far more sensitive to vibration than is commonly realised and may detect vibration levels which are well below levels that may cause damage to buildings or structures. Assessing vibration: a technical guideline was published in February of 2006 by the DEC and is based on guidelines contained in BS 6472 – 1992, Evaluation of human exposure to vibration in buildings (1-80Hz) and provides guidance on assessing vibration against human comfort. Appendix C of the guideline outlines acceptable criteria for human exposure to continuous vibration (1-80Hz), the criteria are dependent on both the time of activity (usually daytime or night-time) and the (as defined in Section 2.1 of the DEC guideline) is assessed using the vibration dose concept which occupied place being assessed. Table 10 (of Appendix 26) reproduces the preferred and maximum criteria relating to measured peak velocity.

Intermittent vibration relates to vibration magnitude and exposure time. Intermittent vibration is representative of activities such as impact hammering, rolling or general excavation work (such as an excavator tracking). Section 2.4 of the DEC Guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV) which requires the measurement of the overall weighted rms (root mean square) acceleration levels over the frequency range 1 Hz to 80 Hz.

The major potential sources of construction vibration include impact hammers during demolition of existing buildings. Equipment and plant have the potential to operate at a minimum offset distance of 10m from the nearest existing school classrooms when demolition work occurs. Generally, there is a low probability of adverse comment or disturbance to building occupants for hammering (medium hammer i.e. 900kg) for distances of up to 30 metres allowing for regular respite periods (Appendix 26).

Operational Noise

The EPA released the NSW INP in January 2000. The INP provides a process for establishing noise criteria for consents and licences enabling the EPA to regulate noise emissions from scheduled premises under the *Protection of the Environment Operations Act 1997*. The daytime operational noise emission criteria for the project have been set in accordance with Section 4.0 of the INP. It is noted that school hours are generally between 9am and 3pm, therefore, only the day assessment period is relevant to this project The Project Specific Noise Levels (PSNLs) (project criteria) is the lower of the intrusive or amenity criteria.

Table 6.10 – Project Specific Noise Criteria, dBA LAeq(15min)

Receiver	Measured RBL LA90, dBA	Intrusiveness Criteria LAea(15min), dBA	Amenity Criterion LAea(15min), dBA	PSNL
Wiripaang Public School	N/A	N/A	35 (internal) / 45 (external)[1] Noisiest 1 hour period	35
Residential NC3 and NC4	48	53	55	53
Residential NC6	39	44	55	44

Note 1: External criteria assumes 10dB for a partially open window.

A hypothetical noise modelling assessment of mechanical plant noise was completed. The model assumed that mechanical air conditioning plant was situated on the northern façade of Block U. Results of the modellings at the nearest receiver NC5 (Wiripaang Public School) predicted noise levels from mechanical plant at <30dBA, and hence satisfies the relevant operational noise criteria for an educational receiver (Appendix 26).

Noise Mitigation of Construction Activities

Construction works associated with the project are expected to be divided into several activities. The activities, plant and duration/occurrence are presented in Table 15 (of Appendix 26). Construction hours are as follows:

- Standard hours: Monday to Friday 7am to 6pm, Saturday 8am to 1pm , no work on Sundays or public holidays
- Out of hours construction 1: Monday to Friday 6pm to 10 pm, Saturday 7am to 8am and 1pm to 10pm, Sunday or public holidays 8am to 6pm
- Out of hours construction 2: Monday to Friday 10pm to 7am, Saturday 10pm to 8am and Sunday or public holidays 6pm to 7am.

The results of the noise assessment demonstrate that levels during standard hours construction periods would satisfy relevant Noise Management Levels at all off site catchments. Notwithstanding, are predicted to impact existing onsite classrooms adjacent to the construction/demolitions areas. External exceedances range from1dB to 24dB above relevant Noise Management Levels at several classrooms in close proximity to works, assuming the classrooms have a partially opened window. It is noted that received internal noise levels would reduce by an additional 10dB (i.e. 20dB attenuation overall) if classroom windows remained closed.

Construction noise levels are predicted to be above the highly noise affected criteria of 75dBA LAeq(15min) at Bock C during Activity 2 and at Block T during Activity 5. 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 sight 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 out of hours periods should be considered. Notwithstanding, priority should be given to conduct work during OOH period 1 (ie 6pm to 10pm) and where possible, works between OOH period 2 (10pm to 7am) should be avoided.

Given the potential for the predicted noise exceedances, noise mitigation strategies should be implemented wherever feasible and practicable during standard or OOH construction 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 the HSHS classrooms and surrounding community.

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.

Australian Standard AS 2436-2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites" sets out numerous practical recommendations to assist in mitigating construction noise emissions. These recommendations include operational strategies, source noise control strategies, noise barrier control strategies, and community consultation. Employing these strategies could potentially result in noise level reductions ranging:

- Up to 10 dBA in instances where space requirements place limitations on the attenuation options available; or
- To potentially over 20 dBA where equipment controls (enclosures, silencers, etc) can be combined with noise barriers and management techniques (eg avoidance of clustering).

Should compliance noise monitoring indicate exceedances of the noise criteria, a combination of comprehensive noise mitigation treatments (i.e. noise barriers, equipment enclosures, silencers, regular equipment maintenance, etc) and consultation with the local community will be considered to manage exceedances. Further descriptions of management measures and mitigation options are provided for specific construction activities and work areas in the following sections.

Results of the assessment demonstrate that construction noise levels would satisfy the relevant Noise Management Levels at all offsite noise catchments during standard construction hours. Onsite noise levels at classrooms were identified to be above the relevant Noise Management Levels, although the Construction Noise and Vibration Management Plan provides prescriptive reasonable and feasible recommendations that can be implemented to reduce potential impacts. In particular, it is recommended that noise intensive activities be completed outside of school hours to minimise the disruption to students. Where construction activities are completed outside of standard hours, reasonable and feasible noise controls will be implemented to minimise offsite noise impacts on the surrounding community and will be validated via attended measurements. It is recommended that during construction and demolition, noise control and management measures provided in this report are adopted to minimise impacts on the adjoining school classrooms and the surrounding community, especially if works are required during out of hours periods to minimise impacts on students and staff.

6.5.3 Environmental Management Measures

During construction and demolition activities, mitigation strategies to manage noise include:

- Up to 25 trucks per day will be required for waste removal and/or delivery of construction materials
- 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 school hours, or in school 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 hi-frequency type reverse alarm
- Minimising the need for reversing or movement alarms
- Conduct noise monitoring throughout the proposal work.

Consultation and notification for out of hours work will include the following:

- Inform affected residents and other sensitive land use occupants the levels of impacts, the associated duration of each activity and what is being adopted at the project to minimize noise impacts to the community. This information should be provided to the community seven days before commencement
- Provide information to neighbours before and during construction through media such as letterbox drops, meetings or individual contact. A website could also be established for the project to provide information
- Implement a site information board at the front of the site with the name of the organisation responsible for the site and their contact details, hours of operation and regular information updates. This signage should be clearly visible from the outside and include standard and after hours emergency contact details
- Maintain good communication between the community and project staff.

Complaints handling will include the following:

- Provide a readily accessible contact point, for example, through a 24-hour toll-free information and complaints line and give complaints a fair hearing
- Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow
- Records of all community complaints will be maintained on an up-to-date complaints register. The records will include:
    - date and time of the complaint
    - the means by which the complaint was made (telephone, mail or email)
    - any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
    - the nature of the complaint
    - any actions taken by the site supervisor/construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action

- if no action was taken by site supervisor/construction contractor in relation to the complaint, the reason why no action was taken.

- Community complaints will be allocated to a responsible contractor representative immediately to facilitate the implementation of corrective actions. The details of the complaint will also be circulated to the applicable construction personnel for action, where required.

Vibration management will include the following:

- To satisfy the human comfort criteria, small hydraulic hammers or hand held jackhammers will be used when in close proximity to adjoining classrooms (ie when at distances of 7m to 23m)
- To minimise vibration impacts during construction/demolition activities vibrating plant selection will take into account relevant offset distances to receivers to achieve both the human comfort and structural damage criteria
- For newly constructed buildings vibration monitoring will be considered so that vibration levels from the project can be quantified and proactively managed against relevant structural criteria

Noise monitoring will be undertaken by a suitably qualified acoustic specialist or suitably qualified and trained environment officer to guide, manage, quantify and control noise emissions from standard and out of hours construction activities. Where monitoring indicates exceedances, additional mitigation measures and controls may be considered to minimise impacts to nearby sensitive receptors. Noise monitoring will include the following:

- Assess construction noise levels against derived Noise Management Levels presented in Section 3.1.1 of the report in Appendix 26, with consideration given to non-site related ambient and background noise at the time of measurements;
- Identify potential noise sources and their relative contribution to noise impacts from construction;
- Specify appropriate intervals for noise monitoring to evaluate, assess and report the noise contribution due to construction;
- Outline the methodologies to be adopted for monitoring construction noise, including justification for monitoring intervals or triggers, weather conditions, monitoring location selection and timing; and
- Incorporate noise management, mitigation and monitoring strategies outlined in the Construction Noise and Vibration Management Plan (Appendix 26)
- Noise measurement procedures employed throughout the monitoring programme shall be guided by the requirements of AS 1055 1997 “Acoustics - Description and Measurement of Environmental Noise” and the EPA’s Industrial Noise Policy (INP), 2000
- In the event of an exceedance of the relevant Noise Management Levels, the Project Manager shall be promptly informed of the location, the margin of exceedance and the source of emission. The noise, meteorological conditions at the time of the survey and plant operating data shall be documented and forwarded to the Project Manager so that an appropriate response can be made with respect to conformance.

6.6 Flora, Fauna and Bushfire

6.6.1 Existing Environment – Ecology

A Biodiversity Assessment Report (BAR) was prepared by Biosis (Appendix 11) and is summarised below.

The study area is within the:

- Sydney Basin Interim Biogeographic Regionalisation of Australia (IBRA) Region
- Wyong IBRA Subregion
- Gosford-Cooranbong Coastal Slopes Mitchell Landscape
- Lake Macquarie Local Government Area (LGA).

Johnsons Creek forms a second order stream that flows through the patch of native vegetation adjoining the ovals to the west flowing north to south and thence south-east into Jewells Wetland. No watercourses or identifiable natural drainage lines occur within the study area.

The study area is located on a flatter area within an area of generally dissected and undulating topography characterised by deep gullies, steep slopes and ridges. Soil landscapes within the study area are from the Late Permian Adamstown Subgroup of Newcastle Coal Measures consisting of conglomerate, sandstone, siltstone, coal and tuff (Hawley *et al*, 1994).

The study area is highly disturbed and modified. It is mostly cleared of native vegetation and replaced by existing school buildings. Small patches of highly modified native vegetation occur mainly in the south eastern corner of the study area, with much smaller remnants elsewhere. The remnant native vegetation generally lacks any native shrub or ground layer. Remnant native elements are restricted to individual, robust shrub and herb species that occur sparsely. The remnant native vegetation in the south eastern corner connects with a band of remnant native vegetation alongside the oval to the south of the study area that runs alongside the Pacific Highway.

Elsewhere within the study area, vegetation is artificially planted in landscaped areas and consists of either a mixture of exotic and native (mostly not locally native) species, or planting arrangements of locally native species such as rows of Spotted Gum *Corymbia maculata* Ironbark *Eucalyptus paniculata* and Swamp Mahogany *Eucalyptus robusta* that are not part of the naturally-occurring vegetation type within the study area.

Extent of Native Vegetation Cover

The extent of native vegetation cover before development for both outer and inner assessment circles was determined as the sum of areas of each of the native vegetation map units listed below, excluding Unclassified Vegetation. To determine the extent of native vegetation cover after development, the extent of vegetation required for removal (0.13 hectares) was subtracted from the extent of native vegetation cover before development.

Bell and Driscoll (2012) map nine native vegetation communities within the outer assessment circle, including:

- MU 5g – Glenrock Sheltered Bluegum Forest
- MU11– Coastal Sheltered Apple-Peppermint Forest.
- MU15 – Coastal Foothills Spotted Gum - Ironbark Forest.
- MU30 – Coastal Plains Smooth-barked Apple Woodland.
- MU31 – Coastal Plains Scribbly Gum Woodland.
- MU37 – Swamp Mahogany - Paperbark Forest.
- MU37e – Coastal Sand Swamp Forest.
- MU44l – Munmorah Impeded Sand Sedgeland.
- MU119 – Kahibah Snappy Gum Forest.

A tenth map unit is unclassified vegetation:

- LM07 – Unclassified Vegetation.

Minor areas are mapped as Unclassified Vegetation, which on examination of high resolution aerial imagery; appear to consist of mostly non-native vegetation or predominantly weedy areas.

To determine the extent of native vegetation cover after development, the extent of vegetation required for removal (0.13 hectares) was subtracted from the extent of native vegetation cover before development. Table 6.11 provides a summary of the extent of native vegetation cover within the inner and outer assessments circles, before and after development. The incremental removal of native vegetation due to the development has not altered the range into which the areas for either the outer or inner assessment circles fall before or after development.

Table 6.11 – Extent of Native Vegetation Cover Before and After Development

Assessment Circle	Before Development		After Development	
	Area (ha)	Percent	Area (ha)	Percent
Outer	325	32.5	325	32.5
Inner	21.5	21.5	21.3	21.3

Assessment of Connectivity Value

The study area does not support any of the following:

- An area identified as being part of a state significant biodiversity link.
- A riparian buffer 50 metres either side of a 6th order stream.
- A riparian buffer 50 metres around an important wetland or estuarine area.
- An area identified as being part of a regionally significant biodiversity link.
- A riparian buffer 20 metres either side of a 4th or 5th order stream,

Therefore, the proposed development will not impact on any state significant biodiversity links or regionally significant biodiversity links.

The study area was assessed as being part of one connective link, with native vegetation to the south of the study area providing connectivity with native vegetation that extends to the west of the study area via narrow links to the south (Appendix 11). The connecting native vegetation is clearly bound by the Newcastle Inner City Bypass to the west, and is deemed to be not connected further by a gap of greater than 100 metres in native vegetation south of the Willow Way overpass.

The study area does not connect to native vegetation the east due to development nor to the north by development, apart from a small patch of remnant native vegetation within the adjoining primary school grounds. The southern section of the single connective link was deemed to be the most limited, with a minimum linkage width of about 20 metres prior to development. This linkage width will be unaffected by the proposed development, and no change in linkage width classes will occur. Therefore, the connectivity width category both before and after development will be the same at >5 metres - 30 metres.

Vegetation within the study area forms part of a relatively small patch of connecting vegetation, extending south to Johnsons Creek and along the eastern side of the Newcastle Inner City Bypass for some distance. While native vegetation also occurs on the western side of the bypass, this road poses a 'hostile barrier' being a four-lane freeway, and is not considered to be connected to the patch. The connection is deemed to end at the Willow Road crossing over the bypass, where greater than a 100 metre gap occurs in native vegetation. The study area was assessed as having a patch size of 21.5 hectares.

Regardless of the estimated level of clearing within the Gosford-Cooranbong Coastal Slopes Mitchell Landscape, at this patch size the study area fits into the 'Small' patch size class.

Vegetation Description

The study area supports 0.13 hectares of identifiable native vegetation that could be aligned with a Plant Community Type (PCT). This formed a single vegetation zone with a very high level of disturbance evident across the subject site. The vegetation zone occurs in several small patches throughout the subject site, with the largest two patches occurring in the south-eastern corner of the subject site. Much smaller patches occur in the central, northern and western parts of the subject site.

Plant Community Types

Only one vegetation type was found to conform to an identifiable native vegetation type that could be aligned with one of the PCTs associated with NSW VIS: Classification Version 2.1 (Table 6.6.2).

Other vegetation types were artificial, and of two types:

- Planted predominantly exotic trees and shrubs, or native trees that are not locally-occurring, many native to other states or regions. This vegetation type occupies several patches and accounts for a moderate portion of the vegetation within the subject site.
- Planted trees, generally consisting of one or two predominantly locally occurring species that are not a part of any naturally-occurring PCT in the site. This vegetation type occupies a minor area within the subject site.

Site investigations, including determination of vegetation communities using the methodology outlined in Section 4.2.1, confirmed the presence of one vegetation community mapped by Bell and Driscoll (2016) within the study area. The distribution of this vegetation community within the study area differed slightly to that as mapped by Bell and Driscoll (2016).

Areas of planted native trees could not be aligned within any PCT in accordance with the FBA requirement and were not considered to constitute native vegetation. They therefore require no further assessment in the FBA (section 5.1.1.3), unless they are assessed as habitat for threatened species.

All areas of native vegetation were assessed as being in moderate/good-poor condition using the FBA (OEH 2014), resulting in one Vegetation Zone within the subject site. The native vegetation zone identified within the study area, including the PCT, the vegetation formation and vegetation class (Keith 2004), its alignment with vegetation communities described by Bell and Driscoll (2016) and the area of the Vegetation Zone is described in Table 6.12 and presented in Figure 6.2.

Table 6.12 – Vegetation Zone Mapped Within the Study Area

Vegetation zone	Plant community type	Vegetation formation	Vegetation class	Vegetation community (Bell and Driscoll, 2016)	Area (ha)
01	PCT 1691: Smooth-barked Apple – Red Bloodwood – Brown Stringybark – Hairpin Banksia heathy open forest of coastal lowlands.	Dry Sclerophyll Forests (Shrubby subformation)	Sydney Coastal Dry Sclerophyll Forests	Coastal Plains Smooth-barked Apple Woodland (MU30)	0.13

The Vegetation Zone shows very high levels of modification and disturbance in the subject site, with minimal levels of shrub and ground cover, including both native and exotic species. The condition of the PCT is generally much lower in the subject site than in the study area more broadly.

Disturbance is primarily the result of past clearing. In the largest patch, the ground in this area has been covered with a layer of gravel to provide space for an informal car parking area. Weeds where they occur generally consist of exotic herbs and grasses. Regeneration is severely inhibited by the gravel layer on the ground and the compaction caused by vehicle parking under the native overstorey trees.

The PCT is generally much more intact in adjoining parts of the study area outside the subject site, with lower ongoing levels of disturbance and higher native species richness. Declared noxious weeds identified in the study area include:

- Bitou Bush *Chrysanthemoides monilifera* subsp. *rotundata*
- Fireweed *Senecio madagascariensis*

Both species are also Weeds of National Significance (WoNS).

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Figure 6.2 – Native Vegetation and BioBanking Plot

Fauna Habitat Present

Trees of a range of sizes were present and comprised remnant native species and planted trees, both native and exotic. No wet areas, mistletoe, rocky areas, large sheoaks, fallen timber, dense canopy foliage or dense understorey vegetation were present.

Only trees 4 and 32 within the subject site (numbering from Terras 2016) were found to contain small to medium hollows. A few trees contained dead sections of the trunk. Some winter flowering tree species were present, comprising mostly planted Spotted Gums and a few planted Swamp Mahogany trees. Some exotic species such as palms provide additional foraging resources on the site for nectivores.

Koala feed tree species present include a few planted Tallowwood *Eucalyptus microcorys* and Swamp Mahogany *Eucalyptus robusta* trees, although these were mostly small trees, and a few Scribbly Gums *Eucalyptus haemastoma*. A patch of remnant vegetation in the south-east corner of the study area (outside the subject site) was found to contain standing dead trees and hollow-bearing trees. An old Common Ringtail Possum drey was observed in this area.

A range of common bird species were observed within the subject site comprising Grey Butcherbird, Noisy Miner, Australian Magpie, Masked Lapwing, Laughing Kookaburra, Australian Raven, Sulphur-crested Cockatoo, Australian Kestrel, Rainbow Lorikeet, Welcome Swallow and Crested Pigeon. A Water Skink was observed to emerge from a concrete drainage sump within the subject site. Anecdotal evidence (Hunter Sports High School General Assistant) indicates that rats and possums are common on the site.

Plots and transect survey data was entered into the BioBanking credit calculator to determine site value scores. Plot and transect survey data is presented in Appendix 1 (of Appendix 11). Current site value for the single Vegetation Zone is outlined in Table 6.13.

Table 6.13 – Site Value Score for the Vegetation Zone

Vegetation Zone	PCT	Site value score	Area (ha)
01	PCT 1619 – Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal Lowlands.	21.88	0.13

Targeted Threatened Flora Survey

One threatened flora species was recorded within the subject site, Narrow-leaved Black Peppermint *Eucalyptus nicholii*. This species is listed Vulnerable by both the NSW TSC Act and Commonwealth EPBC Act. A single tree of the species occurs to the west of the central car park, and is identified as Tree No. 56 in the Arborist Report (Terras 2016). This species is native to the New England area of NSW, and is not a naturally occurring species in the Lake Macquarie area. It has been artificially planted many years previously as part of the landscaping for the school grounds. The specimen has been recommended for removal by the Arborist Report, because of a large amount of dead wood and dieback, and hanging branches (Terras 2016). The tree is therefore likely to be towards the end of its lifespan and in the normal course of events would probably die naturally within the next few years. No additional trees of the species were found to occur within the study area. Being isolated, it is unlikely that the tree forms a part of any locally interbreeding population.

It is therefore concluded in this assessment that it is not appropriate to assess the tree for species credits and no offsets or replacement planting for the species are considered to be required. The species is not considered further in this assessment.

Targeted Threatened Fauna Survey

The habitat assessment carried out within the subject site identified highly modified habitats for fauna within the subject site providing very limited habitat features for threatened fauna species. From the habitat assessment the likelihood of occurrence of threatened fauna species within the subject site was determined (Table 18). With very limited roosting, nesting or foraging opportunities for threatened fauna being found present it was determined that there was a low likelihood of occurrence for most threatened fauna species. Targeted threatened fauna surveys were not carried out for this reason.

Geographic Habitat Features

An assessment of the occurrence of geographic habitat features, in accordance with Section 6.3 of the NSW FBA (OEH 2014) was undertaken, along with a determination of whether impacts to these habitat features will result from the proposed development. The species generated by the calculator associated with the NSW FBA (OEH 2014), along with the results of this assessment are outlined in Table 5 of Appendix 11.

Ecosystem Credit Species

A list of ecosystem credit species predicted to occur within the study area, based on the PCTs present and generated by the calculator associated with the NSW FBA (OEH 2014), along with an assessment of whether they occur within the study area and the Vegetation Zone they are predicted to occur in is provided in Table 6 (of Appendix 11). The potential for a species to occur within the study area was assessed in accordance with Section 6.3 of the NSW FBA (OEH 2014).

None of the ecosystem credit fauna species are associated with the PCT identified as present within the development site. Targeted threatened fauna species surveys were not undertaken for this reason. However, the potential presence of some species could not be dismissed and it was assumed that those species occur within the impact area. The Tg values were reduced for some species assumed present.

Tg values represent how well a species will respond to management at a Biobank site, and, therefore, how the removal of habitat features will impact on the species in a local area. If a species is reliant on habitat features that take a long time to develop (e.g. hollows), or management actions are ineffective at addressing a species decline, or the species has poor fecundity or dispersal capability this will generate a higher Tg value.

Tg values were reduced for the following species:

- Bush Stone-curlew
- Barking Owl
- Speckled Warbler

A number of threatened microbat species have a Tg value of 0.45 and a resultant threatened species offset multiplier of 2.2. These species include:

- Eastern False Pipistrelle
- Eastern Freetail-bat
- Greater Broad-nosed Bat
- Yellow-bellied Sheathtail-bat.

A list of species credit species (flora) predicted to occur within the study area, based on the PCT present, along with an assessment of whether the study area provides suitable habitat and whether the species will be impacted by the development is provided in Table 7 (of Appendix 11). The potential for a species to occur within the study area was assessed in accordance with Section 6.5 of the NSW FBA (OEH 2014).

The assessed likelihood of occurrence of threatened flora species was strongly influenced by the current condition of the habitat available within the proposed impact area (subject site). The remnant native vegetation within the subject site has been subject to a long history of disturbance, including maintenance regimes, high levels of human foot traffic and clearing of the ground and shrub layers and spreading of gravel over most parts of the impact area to provide an informal car park. Most of the ground layer is therefore subject to compaction from regular vehicle use.

Two flora species, *Grevillea parviflora* subsp. *parviflora* and *Rutidosis heterogama*, were identified as candidate species for further assessment, in accordance with Section 6.5 of the FBA. Targeted surveys for these species failed to record any threatened flora species within the study area.

No fauna species were identified as candidate species for further assessment, in accordance with Section 6.5 of the NSW Biobanking Assessment Methodology (OEH 2014). Targeted surveys were not therefore required.

A list of species credit species (fauna) predicted to occur within the study area, based on the PCT present, along with an assessment of whether the study area provides suitable habitat and whether the species will be impacted

by the development is provided in Table 8 (of Appendix 11). The potential for a species to occur within the study area was assessed in accordance with Section 6.5 of the FBA (OEH 2014).

Species Listed Under EPBC Act

Lists of threatened species listed under the EPBC Act recorded or predicted to occur within five kilometres of the study area (from database records or predicted to occur by the BioBanking credit calculator or EPBC Act PMST) are provided in Appendix 3 (of Appendix 11). An assessment of the likelihood of these species occurring in the study area is shown in Table 17 (flora) (of Appendix 11) and Table 18 (fauna) (of Appendix 11). Previous records of threatened species within the locality are shown in Figure 6 (flora) (of Appendix 11) and Figure 7 (fauna) (of Appendix 11). Known habitats for migratory species have been considered and are addressed in Table 6.14.

Vegetation mapping of the study area has been used to determine the presence of threatened ecological communities

Table 6.14 – Assessment of Project Ecological Impacts Against EPBC Act

Matter of NES	Background review	Relevance to the study area and potential for significant impact
Threatened species (flora and fauna)	Thirteen threatened flora species and 13 threatened fauna species have been recorded or are predicted to occur in the locality. An assessment of the likelihood of these species occurring in the study area is provided in Table 17 (flora) (of Appendix 11) and Table 18 (fauna) (of Appendix 11).	Only one of these species (Grey-headed Flying-fox) is considered likely to utilise foraging resources within the study area however, development is unlikely to constitute a significant impact on this species.
Threatened ecological communities	The EPBC Act listed Threatened Ecological Community (TEC) Central Hunter Valley eucalypt forest and woodland is predicted to occur within the study area.	The TEC does not occur in the study area.
Migratory species	Fourteen migratory species have been recorded or are predicted to occur in the locality (Table 19) (of Appendix 1).	While some of these species would be expected to use the study area on occasions, some may do so regularly and others may be resident, the study area does not provide important habitat for an ecologically significant proportion of any of these species.
Wetlands of international importance (Ramsar sites)	There are 12 Ramsar sites in NSW, the closest one being the Hunter Estuary Wetlands.	The study area does not flow directly into any Ramsar site and the development is not likely to result in a significant impact.

The study area does not support important or critical habitat for any threatened species listed under the EPBC Act. The study area does not support the CEEC Central Hunter Valley eucalypt forest and woodland.

6.6.2 Potential Environmental Impact – Ecology

The proposed development will result in minor losses of highly modified native vegetation and potential fauna habitat, with 0.13 hectares of vegetation across one PCT to be permanently removed. This vegetation type is not listed as a NSW or Commonwealth listed threatened ecological community. The study area does not support species credit species, but may provide limited habitat for some ecosystem credit species. Measures to avoid and minimise impacts to vegetation were considered during planning for the school redevelopment and in the Arborist Report (Appendix 9), with additional impact minimisation and mitigation measures considered as a part of the current assessment.

The design of the development during the Planning Proposal phase sought to avoid and minimise impacts to higher value ecological features identified by Terras Landscape Architects (Appendix 9) and de Witt Consulting (2016), however, incremental removal of native trees, some of which form part of highly modified native vegetation remnants, is unavoidable. Identification of the higher value clusters of native trees and remnant native vegetation has resulted in the recommendation by Terras Landscape Architects (Appendix 9) to fence off these areas from the development. Protection of retained areas of native trees by temporary tree protection fencing has been incorporated into the project proposal (Appendix 9).

Potential environmental impacts on flora and fauna are summarised as:

- The area of impacted vegetation within the subject site has not been identified as a Red Flag in the credit calculator. No consideration of red flag areas is required by the FBA
- The study area does not support any 4th, 5th or 6th order streams, estuarine areas, important wetlands, or state or regional biodiversity links
- No offsets for threatened species are required
- Indirect impacts could occur on the SEPP 14 wetland to the south-east of the study area as a result of siltation, sedimentation and unmitigated runoff if adequate controls are not implemented during and following construction. It is expected that standard mitigation measures will address the potential for such indirect impacts as part of the construction protocols and stormwater management structures implemented as part of the proposal. Details of broad measures required are provided in the recommendations
- No species credits were generated by the assessment
- A Biodiversity Offset Strategy is required for submission with the EIS to address the two ecosystem credits required due to native vegetation removal. These credits can be retired either from a suitable offset site or by purchasing the credits required on the market
- Declared noxious weeds identified in the study area include Bitou Bush Chrysanthemoides monilifera subsp. Rotundata and Fireweed Senecio madagascariensis. Both species are also Weeds of National Significance (WoNS) and must be managed.

Potential direct and indirect impacts arising from the development proposal are outlined below.

Potential direct impacts:

- Removal of 0.13 hectares of highly modified and simplified native vegetation from fragmented patches across the subject site for development
- Removal of a total of 80 exotic and native trees. Some of the trees will be removed due to their location in areas where new school infrastructure is required, while others have been recommended for removal by Terras Landscape Architects (Appendix 9) due to their state of health, including their AZ (retention value) rating.

Potential indirect impacts:

- Decreased viability of retained vegetation due to edge effects and use of retained areas of native vegetation resulting from disturbance and degradation of habitat, including damage to seedlings and new growth
- Sedimentation and pollution of waterways from the proposed development, leading to a reduction in water quality along Johnsons Creek, and ultimately the SEPP 14 wetland Jewells Swamp downstream
- Encroachment of invasive exotic weeds species, leading to loss of habitat and suppression of native seedling establishment resulting in changes to vegetation communities over time.

Biodiversity Offset Strategy

Two ecosystem credits for PCT 1619 (HU833) - *Smooth-barked Apple – Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands* are required to offset the impacts on that vegetation type due to the proposed development.

Given the small number of credits required, NSW Department of Education has elected to seek retirement of the credits by purchasing them on the open market, subject to availability, rather than identifying a suitable offset site to obtain the credits. The pathway to be followed to retire the credits will follow the procedure and guidelines for retiring credits as set out in Appendix A of the NSW Biodiversity Offsets Policy for Major Projects (OEH 2014b).

In the first instance, every effort to obtain like-for-like offsets has been or will be pursued. The plan to address this requirement is as follows:

- The BioBanking public register has been checked for the availability of credits of the same PCT as that being impacted. There are no matching credits currently available on the public register.
- An expression of interest for the required credits was placed on the OEH 'Credits Wanted Register' on 23 May 2016 and can be viewed at:

  http://www.environment.nsw.gov.au/bimsprapp/SearchCWR.aspx?ID=65
- The local (Newcastle) OEH office was consulted for advice regarding the availability of appropriate credits or potentially suitable offset sites for the PCT in the local area. No such credits or potential suitable offset sites are currently known to be available. OEH advised that local credit brokers may know of suitable credits that are available.
- Alex Cockerill (National Manager, Ecology - WSP Parsons Brinckerhoff, Newcastle) was contacted to check whether any credits are available for purchases that are not otherwise listed. At this point, Biosis is awaiting advice on this request.

Should all of the above strategies fail to yield the required credits; the following steps will be undertaken:

- Lake Macquarie City Council will be contacted to ascertain whether any suitable credits or land held by Council are available.
- As mentioned above, the low number of ecosystem credits required makes the purchase of an offset site impractical, therefore this strategy has been rejected as an appropriate option.
- Should a period of six months elapse since the expression of interest was placed on the public register with no positive outcome and all other reasonable steps have been exhausted, then a variation of the offset rules (section 10.5.4 of the FBA) will be applied in which credits can be sought from a PCT in the same vegetation formation as the PCT to which the required ecosystem credits relate (OEH 2014a).

Conclusion

The proposed development will result in minor losses of highly modified native vegetation and potential fauna habitat, with 0.13 hectares of vegetation across one PCT to be permanently removed. This vegetation type is not listed as a NSW or Commonwealth listed threatened ecological community. The study area does not support species credit species, but may provide limited habitat for some ecosystem credit species.

Measures to avoid and minimise impacts to vegetation were considered during planning for the school redevelopment and in the arborist report (Terras 2016), with additional impact minimisation and mitigation measures considered as a part of the current assessment. The impacts to native vegetation and species habitat will require retirement of two biodiversity credits across one PCT – *Smooth-barked Apple - Red Bloodwood – Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands*.

6.6.3 Existing Environment – Bushfire

Bushfire Hazard

A Bushfire Protection Assessment has been prepared to consider bushfire requirements for the proposed redevelopment (Appendix 10). In accordance with PBP the predominant vegetation class has been determined for a distance of at least 140 metres out from the subject land. The vegetation consists predominantly of dry sclerophyll forest and coastal swamp forest. This forest is to the west and south within the adjoining Johnsons

Creek riparian corridor. The treed areas within the school grounds and along the southern school boundary is not considered bushfire prone vegetation as there is no understorey and is currently managed; however it is listed as an environmental constraint. In accordance with PBP, the subject land within the school can be classified as 'managed lands'.

In accordance with PBP the slope that would most significantly influence fire behaviour was determined over a distance of 100 metres out from the proposed buildings towards where the bushfire hazard was found. To be conservative, the slope underneath the forest to the west and south has been assessed as within the PBP slope class of '0-5' degree downslope.

Table A2.6 of PBP has been used to determine the width of any required Asset Protection Zone (APZ) for the proposed future buildings. The results of the APZ analysis are shown in Table 6.6.5 below.

The acceptable solution APZ for a Special Fire Protection Purpose building is 70m to the west and south. The managed separation distances (APZ) provided within the school grounds exceeds 70m as shown in Table 1. Additional APZ establishment or vegetation removal is therefore not required. The basketball courts were assessed as part of the APZ rather than a formal building.

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of AS 3959-2009 Construction of buildings in bushfire-prone areas (AS 3959). The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

6.6.4 Potential Environmental Impact – Bushfire

In accordance with the BAL assessment shown in Table 6.15 and Figure 6.3, the proposed buildings are rated as being beyond the requirement for BAL-12.5.

Table 6.15 – Determination of APZ and Construction Standards

Direction	Slope	Vegetation	PBP required APZ	Proposed APZ	AS3959 Bushfire Attack Level	Comment
West	0-5^0 downslope	Forest	70 metres	>100 metres	No requirement	Existing APZ exceeds requirement. Vegetation removal not required.
South	0-5^0 downslope	Forest	70 metres	>100 metres	No requirement	Existing APZ exceeds requirement. Vegetation removal not required.
All other directions	Managed lands.					

1. Direction of assessment from proposed development.

2. Effective slope assessed over 100 m from proposed development where the bushfire hazard occurs.

3. Predominant vegetation classification over 140 m from proposed development.

4. Minimum APZ required by PBP acceptable solution for residential development.

5. APZ proposed to be established and/or provided by existing management arrangements.

6. Bushfire Attack Level (BAL) corresponding to construction requirements under AS 3959-2009 'Construction of Buildings in Bushfire Prone Areas'.

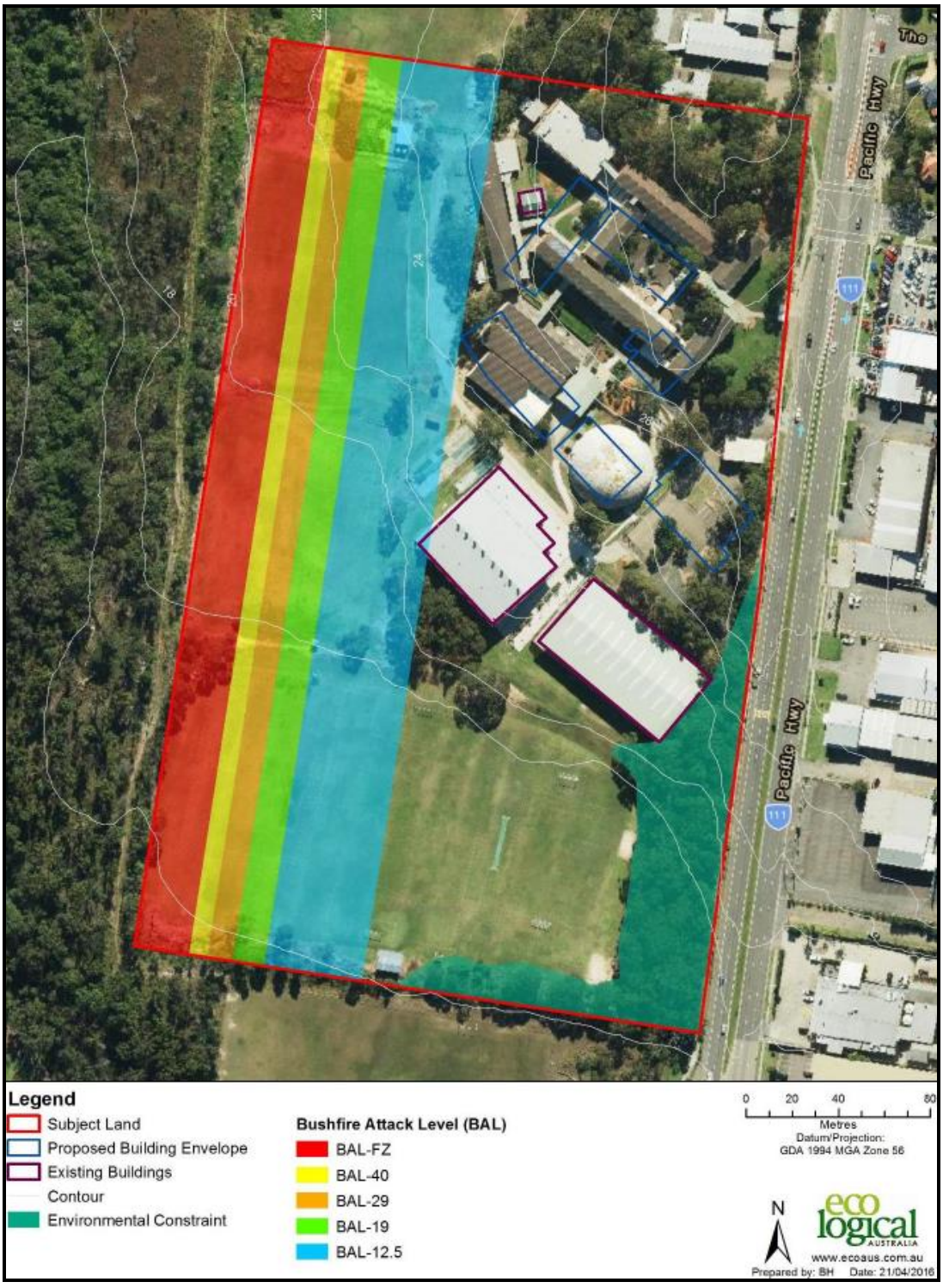

Figure 6.3 – Bushfire Attack Level

Access

The school and proposed development can be accessed directly from the Pacific Highway, driveways along the front of the school and from playing fields surrounding the rear of the school. Access to the development site however cannot be easily gained through the school grounds as the entire interior of the school is security fenced. These details should however have been already addressed with local emergency service authorities.

The state of the existing vehicle access complies with PBP however measures need to be installed to ensure that emergency services have adequate access to the buildings for firefighting operations. No additional provisions are required to support this proposal.

Water Supply

The school is serviced by reticulated water and features hydrants for fire suppression. Hydrants are located within the school at the main entrance and are also located periodically throughout the school. These hydrants will be the closest to the development and the distance between the two (within 60 m) complies with PBP. Additional water supplies are not required for bushfire protection.

Gas and Electrical Supplies

The electrical supply to the subject land is overhead. Tree branches and leaves should not be closer to a powerline than the distance specified in '*ISSC 3 Guideline for Managing Vegetation Near Power Lines*' (Industry Safety Steering Committee, 2005).

Any gas service to be installed is to be in accordance with *AS/NZS 1596:2008 The storage and handling of LP gas* (Standards Australia, 2008).

Conclusion

The proposal consists of the redevelopment of existing school buildings on bushfire prone land and as such is defined as Special Fire Protection Purpose (SFPP) development. The building will have a managed separation distance to the bushfire hazard that exceeds the minimum requirements. This assessment has found that the development can achieve all the acceptable solutions of PBP required for SFPP development, hence achieving the aim and objectives of PBP.

There are no formal construction requirements under Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas.

6.6.5 Proposed Landscaping

Landscape plans in Appendix 6 present the 96 new trees proposed to be planted. Plan drawings showing specific locations of those new tree plantings are Landscape Drawings L12 to L20.

6.6.6 Environmental Management Measures

The following environmental management measures will be implemented:

- Retire two ecosystem credits for PCT 1619 (HU833) - *Smooth-barked Apple – Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands* to offset the impacts on that vegetation type due to the proposed development
- Implement stormwater controls to minimise impacts to aquatic environments from stormwater run-off
- Retain trees wherever possible, particularly those identified in the Landscape Plan (Appendix 6)
- Install appropriate exclusion fencing to the boundary of the retained vegetation and any construction areas where there is some potential for accidental encroachment. This would include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'
- Identify the location of any 'No Go Zones' in site inductions and the Construction Environmental Management Plan
- Ensure construction impacts are retained within the development area, and no encroachment into retained vegetation results from the development. All material stockpiles, vehicle parking and machinery storage should be located within already cleared areas or the areas proposed for clearing, and not in areas of native vegetation that are to be retained

- Wet down areas to reduce dust generation during construction
- Develop an Ecological Management Plan, for inclusion in the Construction Environmental Management Plan. This Ecological Management Plan should outline measures for vegetation clearing to manage fauna species during tree removal, including having a spotter / catcher present. Removal of the two hollow-bearing trees (locations shown as tree nos. 4 and 32 in Appendix 9) should be undertaken separately following prior inspection by a spotter / catcher
- Where feasible, relocate hollows removed from trees to areas of retained vegetation for reuse as either hollows attached to trees or hollow-bearing logs to be placed on the ground as habitat for ground-dwelling fauna
- Native vegetation cleared from the subject site should be mulched for re-use on the site, to stabilise bare ground
- All work boots, machinery and equipment should be cleaned prior to entering the study area, and before being transferred to another site, to minimise risk of transferring soil-borne pathogens and fungi
- Sediment and erosion control measures should be implemented prior to works commencing within the study area (e.g. silt fences, sediment traps), to protect terrestrial and aquatic habitats downstream, particularly the SEPP 14 wetland that is within the catchment. These measures should conform to relevant guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works
- Weed control and management should be undertaken in areas of retained native vegetation within the study area, In particular, Bitou Bush and Fireweed within the construction area should be removed and disposed of appropriately, in such a manner as to avoid its spread and proliferation in areas of native vegetation that are to be retained. Elsewhere, it should be controlled and managed using appropriate removal/control methods for the situation
- Prescriptions for mitigation of potential impacts of construction activities on retained native vegetation and habitat should be addressed in the Construction Environmental Management Plan. An Ecological Management Plan should be prepared to guide removal of vegetation, including recommendations for vegetation management.
- Tree branches and leaves should not be closer to a powerline than the distance specified in 'ISSC 3 Guideline for Managing Vegetation Near Power Lines' (Industry Safety Steering Committee, 2005)
- Any gas service to be installed is to be in accordance with AS/NZS 1596:2008 The storage and handling of LP gas (Standards Australia, 2008)
- Provide landscaping in accordance with Landscape Plans prepared by Terras Landscape Architects (Appendix 6).

6.7 Heritage

6.7.1 Existing Environment

The site is not located in a heritage precinct and does contain a known non-Indigenous heritage item.

A search of the Aboriginal Heritage Information Management System (AHIMS) found one Aboriginal heritage site recorded in or near the study area (50 metre buffer) (Appendix 21).

6.7.2 Potential Environmental Impact

OEH has advised that the Aboriginal heritage site (card number 38-4-0020) was recorded incorrectly and may be discounted. An assessment was carried out in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). This code provides a process whereby a reasonable determination can be made whether or not Aboriginal objects will be harmed by an activity, whether further investigation is warranted and whether the activity requires an AHIP application.

Table 6.16 – Due Diligence Assessment

Question	Response
1. Will the activity disturb the ground surface or any culturally modified trees?	Yes, the Proposal will involve excavation for footings to buildings and pathways.
2. Are there any: a) relevant confirmed site records or other associated landscape feature information on AHIMS? b) any other sources of information of which a person is already aware? c) landscape features that are likely to indicate presence of Aboriginal objects?	 No, there are no recorded sites on AHIMS (site 38-4-0020 has been recorded incorrectly). No, there is no other readily available information that will indicate presence of Aboriginal objects. The site is within 200 metres of watercourse; however the ground is heavily disturbed and is currently used as a school. The site is not within a sand-dune system, located on a ridge top, ridge line or headland, and located within 200 metres below of above a cliff face or within 20 metres of or in a cave, rock shelter or a cave mouth.
Conclusion:	AHIP application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify OEH.

It is considered that there is unlikely to be potential impact to Aboriginal heritage during the construction or ongoing operation of the school.

6.7.3 Environmental Management Measures

As there were no non-Indigenous items identified within the study area, no statement of heritage impact is proposed. As no Aboriginal heritage items were identified near or within the study area mitigation measure proposed relate to unexpected finds.

The following environmental management measures will be implemented:

- 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 skeletal remains are discovered cease work immediately and contact OEH and NSW Police.

6.8 Visual

6.8.1 Existing Environment

The existing environment is shown in Photos 1-8. Buildings on the school are typical of a school environment with one and two storey buildings and associated outdoor learning and recreation areas. Existing buildings are a mix of metal, brick and concrete with metal or tile roofs. The colour scheme is generally soft tones with appropriate setbacks from the street for landscaping and playgrounds.

The Graphical Visual Impact Comparison prepared by EJE Architecture (Appendix 30) provides existing and proposed aerial and street views. The visual impact comparison also provides understanding of the site entry, internal service road access and pedestrian entry path. Existing buildings to be retained are presented in the visual impact comparison (Block Q – Gym, Covered Ball Courts and Covered Outdoor Learning Area). Existing buildings to be demolished are shown pages 35-42 of Appendix 30.

6.8.2 Potential Environmental Impact

The proposal is a redevelopment of the school and playground areas. The buildings are a contemporary design with appropriate space for modern educational facilities and techniques. The maximum building height for the site is 8.5 metres. Maximum building height of the proposed redevelopment is approximately 12.5 metres. At the concept meeting Council advised that "it is not anticipated that there would be any unacceptable impacts resulting from a height non-compliance, having regard to current use of the site, existing development within the locality and the fact that the site is not directly adjacent to any residential properties" (Appendix 8).

Proposed buildings are presented in architectural plans (Appendix 5) and graphically (Appendix 30). The graphical representation shows proposed building designs, materials and movement spaces surrounding the buildings. As shown in Appendix 5 and 30 the proposed buildings are a modern design with contemporary materials and appropriate levels of interaction within and between buildings.

Proposed approximate building heights measured from lowest finished floor levels presented in the architectural plans (Appendix 5) are as follows:

- Block S – 9.855 metres
- Block T – 12.660 metres
- Block U – 9.395 metres.

Block T is represented on page 46 of the visual impact comparison and is contained in the centre of the site (behind Block S) and screened by the existing covered courts and gymnasium. Height of Block T is integral to the overall design as it provides key infrastructure to the school in the form of numerous faculties and learning spaces, staff study and lounge and staff and student amenities. The height provides visual interest to the school and grounds and presents as a quality new building to highlight changes to the school and opportunity to provide contemporary educational facilities that meets community expectations that allow for modern delivery of education to students.

The maximum building height is appropriate to the site and its location to achieve an architecturally designed building that meets the needs of high quality education facilities.

At the concept meeting Council advised that "it is not anticipated that there would be any unacceptable impacts resulting from a height non-compliance, having regard to current use of the site, existing development within the locality and the fact that the site is not directly adjacent to any residential properties" (Appendix 8).

It is considered unnecessary and unreasonable to require an 8.5 metre maximum height for the school site and as such an exception to the development standard is required to achieve the overall objectives of the development.

Figures 6.3-6.5 present 3 dimensional renders of the final built form from the Pacific Highway. As shown in the figures the buildings are contemporary and address the street well. Block S – Movement Complex will be 5 metres from the front setback and all other buildings will be set significantly further back. A range of parking, signage and landscaping treatments will form part of the overall development. Proposed external signage is shown in the signage schedule in Appendix 5. The signage proposed is in keeping with the area, in some cases reusing existing signage, and will be sympathetic to the overall development.

Lighting will be provided throughout the school (Appendix 5). A range of lighting types will be used including recessed LED lights, surface mounted LED, inground uplight and pole mounted. Lighting will be used to improve security and allow for safe movement around the site.

Figure 6.4 – 3D render (looking north west)

Figure 6.5 – 3D render (looking west)

Figure 6.6 – 3D render (looking west)

6.8.3 Environmental Management Measures

Architectural plans (Appendix 5) have been prepared to ensure the development presents well to the street, provides appropriate space for modern educational purposes and has sufficient landscaping and site security for the school. No additional measures are considered necessary.

6.9 Social

6.9.1 Existing Environment

According to the Australian Bureau of Statistics (ABS, accessed 25 February January 2016) approximately 19% of Gateshead are 5-19 years of age. Approximately 19% of the Newcastle and Lake Macquarie statistical area are also 5-19 years of age. While the school will assist students from the broader area, the Census data highlights that a significant portion of the local population are of school age.

6.9.2 Potential Impact

There is ongoing need for quality education in Lake Macquarie and the Hunter generally. Replacement of aging building stock with new purpose built education facilities will provide long term facilities for the community with a focus on 21st century learning, including new classrooms, administration buildings and training facilities. The proposal will result in positive social impacts through a redeveloped educational facility.

The Crime Risk Assessment Report (Appendix 19) states information was provided by the Lake Macquarie Local Area Command's Crime Prevention Officer (CPO) specific to the school site. In considering mitigation strategies and remedial actions there are four basic Crime Prevention Through Environmental Design principles:

- Surveillance
- Access control
- Territorial reinforcement
- Activity and space management.

Following a review of the site context and the design the development is deemed to have a low risk of crime as it integrates measures to mitigate the risk of crime including:

- Access control using fencing and signage
- Surveillance through appropriate floor plans, open space, parking, landscaping and lighting

- Territorial reinforcement through the appropriate delineation of spaces
- Activity and space management through designation of space and provision of opportunities to promote and manage activities in public spaces.

Information was provided by the Lake Macquarie Local Area Command's Crime Prevention Officer (CPO) specific to the school site. Recent reported incidents mostly relate to stealing of personable valuables such as mobile phones. Incidents of fraud were also reported, likely to be associated with the theft and use of key cards. Assault and break and enter are also among crimes reported for the site. Consultation with the CPO indicates that these types of crimes are typical for a school environment. The Crime Risk Assessment Report (Appendix 19) recommends a number of measures to further reduce crime and these have been adopted in the overall design.

Due to works being undertaken within the grounds of an operating high school, the following measures should also be considered to minimise potential work health and safety risks to site users:

- Stage construction activities in order to minimise the area of contaminated soils exposed at any one time
- Provide temporary covers over exposed contaminated soils where capping cannot be completed in a timely fashion to minimise exposure risks
- Conduct higher risk work (i.e. stripping and exposure of contaminated soils) outside school hours (where practical).

6.9.3 Environmental Management Measures

Redevelopment of the school will result in a positive social impact. The following Crime Prevention Through Environmental Design measures will be implemented:

- Surveillance opportunities outside of normal school hours may be improved through the use of night patrols or other organised security services
- Details regarding proposed access control measures such as locks and alarms particularly for the building entries and windows along the southern elevation should be determined prior to construction
- Landscaping treatments will limit opportunity for 'ladders' (e.g. horizontal slats or climbable building elements and locating climbable vegetation) that might assist gaining entry to buildings
- Landscaping maintenance will promote natural surveillance with pruning of low branches to approximately 2 metres high, and the pruning of ground cover and hedges at around waist height
- Signage should clearly identify uses and any access restrictions, and assist with wayfinding to reduce 'excuse making' behaviour
- Department of Education standard maintenance procedures will be implemented to ensure timely repair of damaged property and lighting, and 'rapid removal' approach to graffiti
- Graffiti resistant materials and surface treatments will be used where possible
- Lighting will provide continuous illumination to car parking areas. Motion activated lighting is appropriate around other areas of the site where natural surveillance from public spaces is limited. Lighting will promote surveillance, aid identification, and mitigate potential entrapment or hiding areas
- Activation based lighting will be used in areas of the site that do not have high levels of natural surveillance from a public space
- External lighting will be directed toward approaches to buildings rather than illuminating observers or vantage points (windows and doors)
- Student lockers will be provided to help protect personal items such as mobile phones, money and key cards
- A post construction review will occur to confirm implementation of measures and identify additional suitable measures
- Stage construction activities in order to minimise the area of contaminated soils exposed at any one time

- Provide temporary covers over exposed contaminated soils where capping cannot be completed in a timely fashion to minimise exposure risks
- Conduct higher risk work (i.e. stripping and exposure of contaminated soils) outside school hours (where practical).

6.10 Economic

The project will be delivered under a GC21 Contract. In accordance with the requirements of the GC21 Contract, the Contractor will be required to prepare an Enterprise Training Management Plan that complies with the NSW Government Training Management Guidelines (2009). Further, the Contractor will be required to provide a Project Training Management Plan that will record the number of Apprentices employed as a result of the project. The minimum number of apprentices required is 1 apprentice for every 4 tradespersons, or 20 percent of the average number of tradespersons. The Contractor will also be required to comply with the NSW Government Policy on Aboriginal Participation in Construction. A minimum amount of 1.5% of the Contract Price (as at the Date of Contract) must be spent on employment and education activities for Aboriginal people. At least 50% of this expenditure must be allocated to activities directly related to the Contract. The contractor is required to prepare an Aboriginal Participation Plan and report on participation activities.

The proposal will result in a minor economic benefit to the community in terms of additional employment creation. Up to 150 construction jobs will be generated by the proposed development. The school is an integral part of the community and the redevelopment will ensure ongoing employment for staff and suppliers. The development will however, enable the ongoing operations of the school that provides the following:

- A 5 stream high school designed to accommodate 850 enrolments
- Employment for approximately 69 staff.

6.11 Waste Management

Demolition Waste

Douglas Partners prepared a Targeted Site Investigation for Contamination (Appendix 13). A summary of site features includes:

- Former substation area in the central-eastern portion of the site
- Former location of bus shed (Building M) in the eastern portion of the site
- Former location of dome structure (Building G) in the central-eastern portion of the site
- Asphalt paved area between Block B and L (i.e. area of demolition of former structures)
- Storage shed on the western side of Block F, which included storage of small quantities of chemical, paints and fuels
- Fill and fibro fragments at the surface adjacent to Blocks F and L
- Filling at the southern/south-western extents of playing fields
- Fibro fragments observed at the surface across the site.

Contamination and asbestos will be managed in accordance with an approved Remediation Action Plan that will form part of the Contractors Environmental Management Plan to be completed prior to construction activities commencing on site. A Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings that will need to be disposed of.

Demolition material removed from the site is likely to include:

- Asbestos
- Bricks
- Concrete
- Pipes

- Steel
- Timber
- Paints and chemicals
- Other materials.

It is expected that approximately 500 tonnes of material may be development through demolition activities. This will be confirmed through the Waste Management Plan prepared as part of the CEMP.

Construction Waste

Construction waste will include the following:

- General waste (food scraps, wrappings etc.)
- Concrete slurry
- Steel
- Packaging
- Pipe offcuts
- Timber
- General construction materials.

EJE has advised that approximately 80% of the waste may be recyclable, with 85% of total project waste generated by demolition activities. Volume and management of construction waste will be determined through the Waste Management Plan prepared as part of the CEMP.

Operational Waste

Waste management during operation of the school will be similar to existing as the school is not significantly increasing student numbers or changing activities. The current, and future, management of operational waste will consist of ongoing contract with a licensed contractor. Waste volumes are likely to consist of the following:

- Two general waste bins collected twice a week by Cleanaway
- One recycling bin collected every two weeks by Solo Waste.

Recyclable materials will be separated from general solid waste to maximise and promote recycling in the school.

6.11.1 Environmental Management Measures

- Prepare a Waste Management Plan
- Determine volumes and nature of material to be removed from site, including potential for recycling,
- Site remediation and management will be conducted in accordance the Remediation Action Plan (Appendix 31).
- Additional investigation for contamination will also occur following demolition of site structures in order to confirm remediation 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 "The Blue Book",* Landcom (2004) and Aurecon plan (Appendix 14) with regard to recommendations of Douglas Partners Report on Targeted Site Investigation for Contamination (Appendix 13)
- 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.

6.12 Chemical and Fuel Storage

A number of chemicals will stored on site. The information provided is from a stocktake at the school in 2015 (Appendix 28), however materials and their quantity are unlikely to change significantly as a result of the redevelopment. Chemicals to be stored at the school are similar to existing ones and include:

- U Block – art equipment including glues, bleach, paints and cleaners
- T Block – storage or majority of chemicals including acid, bleach, cleaning products, fertiliser, laboratory chemicals, oils, paint, potting mix,
- T Block – LPG gas cylinders stored in secure mesh cage external to block T (adjacent to delivery area for wood and metal workshops)
- N Block (metal shed at end of service road) – fuel for gardening equipment.

6.12.1 Environmental Management Measures

The following environmental management measures will be implemented:

- 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
- An 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.

6.13 Management Plans

A Construction Environmental Management Plan (CEMP) will be prepared by the preferred contractor that incorporates the mitigation measures identified in this EIS. The CEMP will include a stormwater management plan, groundwater management plan, erosion and sediment control plan, construction traffic management plan and waste management plan.

An Operational Management Plan will be prepared and include a Water Management Plan, and the relevant operational measures identified in this EIS, in particular those relating to the minimisation of contamination, waste, noise, traffic impacts and dust.

6.14 Cumulative issues

Redevelopment of Hunter Sports High will not occur at the same time as any other major developments in the area and as such there is unlikely to be cumulative impact of several major constructions at the same time.

Removal of trees will be addressed early in the development to allow for other stages of construction. Remediation of contamination will occur in various stages of the development including early works, during demolition of buildings and as part of earthworks across the site. Traffic and access will be impacted during construction, however this can be managed through a construction traffic management plan. Noise during construction may impact on students of the school, however noise can be managed with appropriate management measures and monitoring. Visual impact can be managed through a tidy construction site and architecturally designed buildings. Waste management will be required during construction and operation and can be appropriately managed.

There is unlikely to be significant cumulative issues as a result of the proposed redevelopment of the school.

6.15 Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) is defined in Section 6(2) of the *Protection of the Environment Administration Act 1991*. ESD and how it has been considered in this EIS is presented in Table 6.17.

Table 6.17 Ecologically Sustainable Development Principles

ESD Principle and Programme	Comment
the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and (ii) an assessment of the risk-weighted consequences of various options	The proposed development has sought necessary information, including specialist advice, to have an understanding of potential environmental impacts. Environmental mitigation measures have been proposed to ameliorate potential impacts to the environment.
inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations	Positive impacts of a modern educational establishment through the redeveloped school will be a benefit to future generations. Environmental impacts of the development have been minimised through appropriate design and environmental mitigation measures.
conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration	Specialist ecological advice has been sought on the proposed development. Native vegetation will be removed and two ecosystem credits will be retired by purchasing the credits required on the market.
improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services, such as: (i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.	Environmental attributes of the site have been identified throughout this EIS. Impact to the environment has been avoided, where practicable, and environmental mitigation measures are identified to ameliorate environmental impact. Environmental factors form part of appropriate development of the site and ongoing management of those factors will occur in accordance with this EIS.

6.16 Environmental Risk Assessment

Environmental risks have been considered based on specialist investigations, findings of this EIS and proposed environmental mitigation measures. The EIS found that environmental risks can be appropriately managed through the environmental mitigation measures and is unlikely to have a significant impact on the environment.

Table 6.18 –Environmental Risk Rating Following Implementation of Environmental Mitigation Measures

Environmental Issue	Risk	Comment
Traffic and Transport	Low	Access to the site is provided from the Pacific Highway. Consultation with RMS and the traffic assessment found the proposed development can been accessed appropriately with adequate parking.
Soils, Geology and Contamination	Low	The site is contaminated by previous activities and buildings that contain asbestos. The Remediation Action Plan must be complied with and site validation is required to ensure the site is remediated for the proposed use. Air monitoring is required at the boundaries of the site to monitor the presence of airborne asbestos fibres. A Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition and determine any additional controls required to ensure safety of students, staff and visitors
Water Quality and Flooding	Low	The study area is located within the Jewells Swamp catchment, a SEPP 14 wetland. Groundwater was found in boreholes at a depth of 1.2 metres. A groundwater management plan and stormwater management plan (including a staged erosion and sediment control plan) will appropriately manage water quality. As the post developed flows leaving the site will not exceed existing flows, and the 100 year flood extent is below the level of the site discharge point, the proposed development will have no adverse impact on flooding within or external to the site.
Air Quality	Low	Dust (airborne particulate matter) during construction is identified as being the key air quality issue to be assessed. Appropriate dust control during construction will ameliorate potential off site dust emission. Air monitoring is required at the boundaries of the site to monitor the presence of airborne asbestos fibres.
Noise	Low	On site noise levels at classrooms were identified to be above the relevant noise management level. Vibration management requires careful selection of the size of the impact hammers and operational noise emissions from mechanical plant are expected to satisfy relevant operational noise criteria at the nearest affected receivers. Noise will be managed during construction through mitigation strategies, vibration management and monitoring.
Flora, Fauna and Bushfire	Low	Approximately 80 trees will require removal. The proposed development will result in minor losses of highly modified native vegetation and potential fauna habitat, with 0.13 hectares of vegetation across one plant community type to be permanently removed. This vegetation type is not listed as a NSW or Commonwealth listed threatened ecological community. The study area does not support species credit species, but may provide limited habitat for some ecosystem credit species. Measures to avoid and minimise impacts to vegetation were considered during planning for the school redevelopment and in the arborist report (Terras 2016), with additional impact minimisation and mitigation measures considered as a part of the current assessment. The impacts to native vegetation and species habitat will require retirement of two biodiversity credits across one plant community type –

Environmental Issue	Risk	Comment
		Smooth-barked Apple - Red Bloodwood – Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands.
Heritage	Low	The site is not located in a heritage precinct and does contain a known non-Indigenous heritage item. An assessment carried out in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* found there is unlikely to be potential impact to Aboriginal heritage during the construction or ongoing operation of the school.
Visual	Low	Existing aged buildings will be replaced by new contemporary buildings and will provide a positive visual impact.
Social	Low	The proposal will result in positive social impacts through a redeveloped educational facility. A number of measures to be implemented in the school to reduce crime risk including surveillance opportunities, landscaping treatments, maintenance and lighting.
Economic	Low	The proposal will result in a minor economic benefit with up to 150 construction jobs generated, including apprentices. The redevelopment will ensure ongoing employment for staff and suppliers.
Waste Management	Low	Contamination and asbestos will be managed in accordance with the Remediation Action Plan (Appendix 31) and a Hazardous Materials Report for all buildings. All waste generated by the proposal will be classified prior to disposal to a licenced facility through an approved Waste Management Plan.
Chemical and Fuel	Low	The proposal is redevelopment of an existing school and as such is likely to create negligible negative visual impact.

7. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national framework for environmental protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places. Part 3 of the EPBC Act lists nine matters of National Environmental Significance (NES) that may require approval from the Commonwealth Minister for the Environment. An action taken by any person on Commonwealth land that is likely to have a significant impact on the environment (Section 26(1)) or an action taken by any person outside of Commonwealth land that is likely to have a significant impact on Commonwealth land (Section 26(2)) may require approval from the Commonwealth Minister for the Environment.

An EPBC Act Protected Matters Report (31 May 2016) (Appendix 29) identified the following matters of NES that may occur within 10km of, or may relate to, the site. Refer to Section 6.6 for discussion on flora and fauna.

Table 7.1: Matters of National Environmental Significance (NES)

Matters of NES	Occurrence in or near the site (10km buffer)
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Threatened Ecological Communities	3
Threatened Species	71
Migratory Species	73

An action taken by any person on Commonwealth land that is likely to have a significant impact on the environment (Section 26(1)) or an action taken by any person outside of Commonwealth land that is likely to have a significant impact on Commonwealth land (Section 26(2)) may require approval from the Commonwealth Minister for the Environment. Other matters protected by the EPBC Act, including Commonwealth land, identified in the search is presented in Table 6.2.

Table 7.2: Other Matters

Other Matters Protected by the EPBC Act	Occurrence in or near the site (10km buffer)
Commonwealth Land	11
Commonwealth Heritage Places	None
Listed Marine Species	94
Whales and Other Cetaceans	None
Critical Habitats	None
Commonwealth Reserves Terrestrial	None
Commonwealth Reserves Marine	None

Commonwealth land will not be affected by the Proposal. Other relevant issues have been considered throughout this EIS.

Table 7.3 provides an assessment of the proposed development against each matter of NES.

Table 7.3: Matters of NES Assessment

Matters of NES	Comment	Likely Impact
World Heritage Properties	No world heritage properties would be significantly affected by the proposal.	Nil
National Heritage Places	No national heritage places would be significantly affected by the proposal.	Nil
Wetlands of International Significance	The site is within the Jewells Swamp catchment (a SEPP 14 wetland). The proposal will not significantly impact the wetland and will not impact a wetland of international significance.	Nil
Great Barrier Reef Marine Park	The Great Barrier Reef Marine Park would not be impacted by the proposal.	Nil
Commonwealth Marine Areas	No Commonwealth Marine Areas would be significantly impacted by the proposal.	Nil
Threatened Species and Ecological Communities	The Biodiversity Assessment Report found no significant impacts on any of the potential matters of NES identified were considered likely to be triggered by the proposal. Refer to Section 6.6.	Nil
Migratory Species	The Biodiversity Assessment Report found no significant impacts on any of the potential matters of NES identified were considered likely to be triggered by the proposal. Refer to Section 6.6.	Nil

Referral under the EPBC Act is not required for the proposed development.

8. LIST OF APPROVALS AND LICENCES

8.1 Environmental Protection Licence

The *Protection of the Environment Operations* (POEO) *Act* 1997 sets out the circumstances in which an Environmental Protect Licence (EPL) is required. An EPL pursuant to Section 48 of the POEO Act is not required for activities listed in Schedule 1 of the Act. The proposal does not require an EPL.

8.2 Groundwater Extraction

If during construction more than 3 Ml of groundwater is proposed to be extracted an approval/license is required from the NSW Office of Water.

8.3 Asbestos Removal

A WorkCover NSW asbestos removal work licence under the Work Health and Safety Regulation 2011 needs to be issued and complied with, including appropriate notification prior to commencement.

9. CLAUSE 228 FACTORS

Factors required to be taken into account under Clause 228 of the *Environmental Planning and Assessment Regulation 2000* are presented in Table 8.1.

Table 9.1: Consideration of Environmental Assessment

Proposal Description:		Extension of Gateshead Sports High
Assessment Factor		Description of potential impact
a)	Any environmental impact on a community	The proposal will result in minor impact on the environment through removal of native vegetation and will be offset by two ecosystem credits. Contamination on the site will be managed through the Remediation Action Plan and site validation. Visual impact will be positive. The proposal will not result in a significant impact on a community.
b)	Any transformation of a locality	The proposal will result in replacement of existing school buildings and infrastructure in a positive manner.
c)	Any environmental impact on the ecosystems of the locality	Providing the recommendations of the various specialist reports are adopted, it is unlikely the proposal will have a significant impact on any threatened species, populations and / or ecological communities under the *Threatened Species Conservation Act 1995* or *Environment Protection and Biodiversity Conservation Act 1999*.
d)	Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	The proposal will have a visual positive impact on the locality and through appropriate building design and landscaping will not reduce environmental quality or value of the locality.
e)	Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	There are no known heritage or archaeological sites that would be impacted by the Proposal.
f)	Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)	Providing the Ecologist recommendations are adopted it is unlikely that the proposal will have a significant impact on any threatened species, populations and / or ecological communities *Threatened Species Conservation Act 1995* or *Environment Protection and Biodiversity Conservation Act 1999*.
g)	Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	Providing the Ecologist recommendations are adopted it is unlikely that the proposal will have a significant impact on any threatened species, populations and / or ecological communities *Threatened Species Conservation Act 1995* or *Environment Protection and Biodiversity Conservation Act 1999*.
h)	Any long-term effects on the environment	The proposal will result in minor impact on the environment through removal of native vegetation and will be offset by two ecosystem credits. Contamination on the site will be managed through the Remediation Action Plan and site validation. Long term visual impacts will be positive.

Assessment Factor		Description of potential impact
i)	Any degradation of the quality of the environment	The proposal will result in minor impact on the environment through removal of native vegetation and will be offset by two ecosystem credits. Contamination on the site will be managed through the Remediation Action Plan and site validation. Overall quality of the environment will not be significantly degraded by the development.
j)	Any risk to the safety of the environment	Environmental mitigation measures will minimise risk to the safety of the environment during construction.
k)	Any reduction in the range of beneficial uses of the environment	The proposal will not result in reduction of beneficial uses of the environment, in particular, educational land uses on the site and in the vicinity.
l)	Any pollution of the environment	Environmental mitigation measures will ameliorate potential for pollution of the environment.
m)	Any environmental problems associated with the disposal of waste	Wastes generated will be classified and removed from site for disposal at an appropriate waste facility.
n)	Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	The proposal will utilise resources that are not in short supply. New buildings will improve energy and water efficiency.
o)	Any cumulative environmental effect with other existing or likely future activities	The proposal is unlikely to have a significant cumulative impact on the environment.
p)	Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	None.

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 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.

10.2 Traffic and Transport

- Comply with Traffic and Parking Impact Assessment and Supplementary Information (Appendix 17)
- Driveway to be 7.5 metres wide, plus splays, and a 20 metres upstream no parking zone
- New driveway to operate as a Left IN/Left OUT
- A dedicated deceleration lane is not deemed necessary
- Parent parking should follow the "*Interim Guideline for the Planning and Design of School Traffic and Pedestrian Facilities*" as published by the RMS (formerly Traffic Authority of NSW)
- On site carpark designed in accordance with AS2890.1, AS2890.6 and AS2890.2 except where existing operation supports departure
- Relocate "5 min 8:00-9:30am; 2:30-4:00pm School Days Only" parking zone to start 10m from the proposed southern carpark driveway and extend for 120 metres
- Incorporate access for ambulance and fire service vehicles to all sports fields and parking areas
- Offset of 51m minimum from Pacific Highway U-Turn bay to proposed southern carpark driveway to allow decision and deceleration distance
- Retention of existing bus zones and service arrangements
- Prepare Construction Traffic Management Plan as part of the Construction Environment Management Plan to manage traffic during construction.

10.3 Soils, Geology and Contamination

- Comply with conditional approval of Mine Subsidence Board dated 22 January 2016
- Construction to comply with requirements of the Report on Geotechnical Investigation, Douglas Partners, October 2015 including excavation and batters, retaining walls and subgrade preparation
- No person will be permitted to enter an unsupported excavation where it is more than 1.5 metres deep or where it is considered to be unstable, irrespective of depth
- Site remediation and management will be conducted in accordance with the Remediation Action Plan (Appendix 31)
- Staged construction will be conducted, including work outside school hours (where practical) in order to minimise potential exposure/risks to site users
- Imported fill used to reinstate site excavations, raise site levels (if required) and in pavement or landscape areas should be classified as Virgin Excavation Natural Material (VENM) or Excavation Natural Material (ENM)
- Records of all imported filling and placement should also be maintained by the contractor
- Additional investigation for contamination will also occur following demolition of site structures in order to confirm remediation requirements

- Additional investigation will occur to delineate the extent of impacted soils and confirm the suitability for on site management of contaminated soils and aid the assessment and likely volumes
- Materials requiring off-site disposal must be classified in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014)
- Asbestos contaminated soil/fill from the development area that cannot be accommodated under capping will require disposal to a licensed landfill as 'special waste' in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014)
- Classification of materials for off-site disposal will include inspection, sampling and analysis at generally not less than one per 25m^3. The frequency of testing required for classification should be confirmed by a suitably qualified environmental consultant, and will depend on the volume and consistency of the material
- Appropriate tracking of the excess soils should be conducted by the licenced contractor
- Contaminated material should be stockpiled at suitable locations within the site. All stockpiles of contaminated material shall be appropriately fenced and demarcated to clearly delineate their boundaries. Stockpiles shall be lightly conditioned by water sprinkler and covered by geotextile or similar cover to prevent dust blow. Geotextile silt fences or hay bales should be erected around each stockpile to prevent losses by surface erosion where required or sediment run-off. The location and quantity of stockpiled contaminated soils should be recorded by the contactor
- If temporary stockpiling is required outside 'the site' area or within the site following capping, stockpiles should be placed over plastic to minimise cross-contamination with underlying soils. The footprint of such stockpiles should also be validated via inspection and testing following removal
- The following procedure is recommended for the loading and transport of contaminated materials from the site (if required):
    - Transport of contaminated material off the site should be via a clearly demarcated haul route
    - Removal of waste materials from the site should only be carried out by an experienced contractor holding appropriate licences, consents and approvals
    - Details of all contaminated materials removed from the site should be documented by the contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate). Such information should be provided to the environmental consultant responsible for site validation for reporting purposes
    - Measures should be implemented to minimise the potential for contaminated material to be spilled onto public roadways or tracked off-site on vehicle wheels
- In the event that contamination is found to be migrating along preferential pathways (e.g. observed staining/odours within service trenches and conduits), the following contingency procedure will be adopted:
- Remedial excavations will be continued in the direction of migration to the practical extent possible (without causing damage to infrastructure) as directed by the structural engineer (it is anticipated that the extent to which impacted materials can be chased-out along service conduits would be limited due to structural elements and services) and site boundaries
- If impacted materials are present at the practical limits of the remedial excavation, validation samples will be collected and analysed per the requirements of Section 10.1 (of Appendix 31) to determine the degree of residual contamination present
- If concentrations of residual contaminants at the practical extent of the remedial excavation exceed the landuse criteria then the following additional contingencies may be adopted:
    - Site specific risk assessment will be undertaken to determine the actual level of risk to human health

- Groundwater monitoring wells/soil bores will be considered (if feasible) hydraulically down gradient of the observed impacted material/preferential pathway to attempt to define extent and degree of preferential migration
- Based on the results of the above, additional management controls and/or groundwater remediation measures may be required

- The environmental consultant responsible for site validation should assess sampling accuracy and precision
- A validation report will be prepared by a suitably qualified environmental consultant including inspection to confirm that appropriate capping has been achieved in accordance with the Remediation Action Plan
- A long term Site Management Plan will be prepared at completion of remediation works to promote awareness of contamination management and requirements to avoid disturbance (where possible). The Site Management Plan will be in accordance with the Remediation Action Plan (Appendix 31) and noted on the Section 149 certificate
- A WorkCover NSW asbestos removal work licence under the Work Health and Safety Regulation 2011 will be issued and complied with, including appropriate notification prior to commencement
- 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 "The Blue Book",* Landcom (2004) and Aurecon plan (Appendix 14) with regard to recommendations of Douglas Partners Report on Targeted Site Investigation for Contamination (Appendix 13) and Remediation Action Plan (Appendix 31)
- Appropriate measures will be taken to minimise the potential for potentially contaminated water or sediments to leave the site. Such measures could include:
  - Construction of diversion bunds to divert stormwater from contaminated areas and contaminated
  - soil stockpiles
  - Provision of sediment traps including geotextiles or hay bales. This would be required for contaminated soil stockpiles to prevent losses by surface erosio
  - Construction of sediment control basins (if required)
- Discharge of any waters should meet the consent conditions from the appropriate authority. This will be verified by sampling and analyses undertaken by the contractor
- If gross soil contamination is identified on site during remediation works, the materials should be appropriately investigated by a suitably qualified environmental consultant and either managed on site (if appropriate) or disposed off-site to a licenced landfill following classification
- Prepare contingency procedures including incident management and unexpected finds protocol (refer to Section 9.9 of Appendix 31)
- Playing fields will be included in ongoing long term site management as a precautionary measure
- Construction and ongoing use of the site will be in accordance with the Remediation Action Plan, including Section 7 – Responsibilities (Appendix 31)
- The contractor is responsible that the site works comply with the following conditions:
  - Wastes generated at the site are disposed in an appropriate manner
  - Fugitive dust leaving the confines of the site is minimised. As a precaution, air monitoring will be conducted at the boundaries of the site to monitor the presence of airborne asbestos fibres
  - No water containing any suspended matter or contaminants leaves the site in a manner which could pollute the environment
  - Vehicles shall be cleaned and secured so that no mud, soil or water are deposited on any public roadways or adjacent areas

- Noise and vibration levels at the site boundaries comply with the legislative requirements

- Appropriate air monitoring should be conducted by the occupational hygienist during remediation. Management measures regarding air monitoring should be established (i.e. additional management measures, stop work etc)
- All vehicular traffic shall use only routes approved by Council, to and from the selected landfill where off-site disposal is undertaken. The proposed landfill should be consulted for any additional requirements
- All loads shall be tarpaulin covered and lightly wetted to minimise the potential for materials or dust are dropped or deposited outside or within the site
- Each vehicle that has trafficked potentially impacted site soils within the site shall be inspected for cleanliness before being logged out as clean (wheels and chassis), or hosed down into a wheel wash or wash down bay (located at the site exit) until designated as clean when exiting the site
- Wheel wash silt residues should be collected periodically and either returned to the excavation area or included in the remediation stockpile. Such material will be treated as contaminated unless analysis proves otherwise
- Removal of waste materials from the site shall only be carried out by a licensed contractor holding appropriate licence, consent or approvals to dispose the waste materials according to the classification
- Waste tracking should be conducted by the licensed contractor in accordance with regulatory requirements. Details of all materials removed from the site shall be documented by a contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate) provided to the environmental consultant responsible for site validation. A site log shall be maintained by the contractor to track disposed loads against on-site origin and location of the materials
- Truck dispatch shall be logged and recorded by the contractor for each load leaving the site. A record of the truck dispatch should be provided to the environmental consultant responsible for site validation by the contractor
- Similarly tracking and documentation of all on site movements of material should be maintained by the contractor.

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 "The Blue Book",* Landcom (2004) and Aurecon plan (Appendix 14) with regard to recommendations of Douglas Partners Report on Targeted Site Investigation for Contamination (Appendix 13)
- Appropriate measures provided in the Remediation Action Plan (Appendix 31) taken to minimise potential for potentially contaminated water or sediments to leave the site could include:
    - Use of a water cart, as and when appropriate, to eliminate wind-blown dust
    - Use of sprays/sprinklers to prevent dust blow from stockpiles
    - Covering of stockpiles with plastic sheeting or geotextile membranes
    - Restriction of stockpile heights to 2 m above surrounding site level
    - Ceasing works during periods of inclement weather such as high winds or heavy rain
    - Regular checking of the fugitive dust and odour issues. Undertake immediate remediation measures to rectify any cases of excessive dust or odour
    - Provision of temporary capping over site soils such as the contractor staging area
- Stormwater management will be in accordance with Stormwater Management Plan prepared by Aurecon (Appendix 14)
- Stormwater management will be staged in accordance with construction milestones (Appendix 23)

- All new stormwater pits on the site will incorporate EnviroPod™ 200micron filter inserts and maintained in accordance with manufacturers requirements
- 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 (Appendix 14)
- Potable water reuse and efficient water saving equipment will be provided in accordance with Section 6.2.3 of this EIS
- A groundwater management plan will be included in the CEMP to minimise potential for erosion and sedimentation and ensure appropriate disposal of groundwater
- If during construction more than 3 Ml of groundwater is proposed to be extracted an approval/license is required from the NSW Office of Water.

10.5 Air quality

Construction Phase

- Prior to demolition a Hazardous Materials Report will be prepared to determine potential for hazardous materials in existing buildings prior to demolition and determine any additional controls required to ensure safety of students, staff and visitors
- Appropriate air monitoring will be conducted by the occupational hygienist during remediation. Management measures regarding air monitoring will be established (i.e. additional management measures, stop work etc)
- 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.

Operational Phase

- Empty outdoor bins at the end of each day
- Maintain landscaping to minimise exposed soil
- Exhaust system provided for the relocated fume cupboards will comply with all relevant statutory requirements.

10.6 Noise

- Up to 25 trucks per day will be required for waste removal and/or delivery of construction materials
- 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 school hours, or in school 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 hi-frequency type reverse alarm
- Minimising the need for reversing or movement alarms
- Conduct noise monitoring throughout the proposal work.

Consultation and notification for out of hours work will include the following:

- Inform affected residents and other sensitive land use occupants the levels of impacts, the associated duration of each activity and what is being adopted at the project to minimize noise impacts to the community. This information should be provided to the community seven days before commencement
- Provide information to neighbours before and during construction through media such as letterbox drops, meetings or individual contact. A website could also be established for the project to provide information
- Implement a site information board at the front of the site with the name of the organisation responsible for the site and their contact details, hours of operation and regular information updates. This signage should be clearly visible from the outside and include standard and after hours emergency contact details
- Maintain good communication between the community and project staff.

Complaints handling will include the following:

- Provide a readily accessible contact point, for example, through a 24-hour toll-free information and complaints line and give complaints a fair hearing
- Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow
- Records of all community complaints will be maintained on an up-to-date complaints register. The records will include:
    - date and time of the complaint
    - the means by which the complaint was made (telephone, mail or email)
    - any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
    - the nature of the complaint
    - any actions taken by the site supervisor/construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action
    - if no action was taken by site supervisor/construction contractor in relation to the complaint, the reason why no action was taken.

- Community complaints will be allocated to a responsible contractor representative immediately to facilitate the implementation of corrective actions. The details of the complaint will also be circulated to the applicable construction personnel for action, where required.

Vibration management will include the following:

- To satisfy the human comfort criteria, small hydraulic hammers or hand held jackhammers will be used when in close proximity to adjoining classrooms (ie when at distances of 7m to 23m)
- To minimise vibration impacts during construction/demolition activities vibrating plant selection will take into account relevant offset distances to receivers to achieve both the human comfort and structural damage criteria
- For newly constructed buildings vibration monitoring will be considered so that vibration levels from the project can be quantified and proactively managed against relevant structural criteria

Noise monitoring will be undertaken by a suitably qualified acoustic specialist or suitably qualified and trained environment officer to guide, manage, quantify and control noise emissions from standard and out of hours construction activities. Where monitoring indicates exceedances, additional mitigation measures and controls may be considered to minimise impacts to nearby sensitive receptors. Noise monitoring will include the following:

- Assess construction noise levels against derived Noise Management Levels presented in Section 3.1.1 of the report in Appendix 26, with consideration given to non-site related ambient and background noise at the time of measurements;
- Identify potential noise sources and their relative contribution to noise impacts from construction;
- Specify appropriate intervals for noise monitoring to evaluate, assess and report the noise contribution due to construction;
- Outline the methodologies to be adopted for monitoring construction noise, including justification for monitoring intervals or triggers, weather conditions, monitoring location selection and timing; and
- Incorporate noise management, mitigation and monitoring strategies outlined in the Construction Noise and Vibration Management Plan (Appendix 26)
- Noise measurement procedures employed throughout the monitoring programme shall be guided by the requirements of AS 1055 1997 “Acoustics - Description and Measurement of Environmental Noise” and the EPA’s Industrial Noise Policy (INP), 2000
- In the event of an exceedance of the relevant Noise Management Levels, the Project Manager shall be promptly informed of the location, the margin of exceedance and the source of emission. The noise, meteorological conditions at the time of the survey and plant operating data shall be documented and forwarded to the Project Manager so that an appropriate response can be made with respect to conformance.

10.7 Flora, Fauna and Bushfire

- Retire two ecosystem credits for PCT 1619 (HU833) - *Smooth-barked Apple – Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands* to offset the impacts on that vegetation type due to the proposed development
- Implement stormwater controls to minimise impacts to aquatic environments from stormwater run-off
- Retain trees wherever possible, particularly those identified in the Landscape Plan (Appendix 6)
- Install appropriate exclusion fencing to the boundary of the retained vegetation and any construction areas where there is some potential for accidental encroachment. This would include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'
- Identify the location of any 'No Go Zones' in site inductions and the Construction Environmental Management Plan
- Ensure construction impacts are retained within the development area, and no encroachment into retained vegetation results from the development. All material stockpiles, vehicle parking and machinery

storage should be located within already cleared areas or the areas proposed for clearing, and not in areas of native vegetation that are to be retained

- Wet down areas to reduce dust generation during construction
- Develop an Ecological Management Plan, for inclusion in the Construction Environmental Management Plan. This Ecological Management Plan should outline measures for vegetation clearing to manage fauna species during tree removal, including having a spotter / catcher present. Removal of the two hollow-bearing trees (locations shown as tree nos. 4 and 32 in Appendix 9) should be undertaken separately following prior inspection by a spotter / catcher
- Where feasible, relocate hollows removed from trees to areas of retained vegetation for reuse as either hollows attached to trees or hollow-bearing logs to be placed on the ground as habitat for ground-dwelling fauna
- Native vegetation cleared from the subject site should be mulched for re-use on the site, to stabilise bare ground
- All work boots, machinery and equipment should be cleaned prior to entering the study area, and before being transferred to another site, to minimise risk of transferring soil-borne pathogens and fungi
- Sediment and erosion control measures should be implemented prior to works commencing within the study area (e.g. silt fences, sediment traps), to protect terrestrial and aquatic habitats downstream, particularly the SEPP 14 wetland that is within the catchment. These measures should conform to relevant guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works
- Weed control and management should be undertaken in areas of retained native vegetation within the study area, In particular, Bitou Bush and Fireweed within the construction area should be removed and disposed of appropriately, in such a manner as to avoid its spread and proliferation in areas of native vegetation that are to be retained. Elsewhere, it should be controlled and managed using appropriate removal/control methods for the situation
- Prescriptions for mitigation of potential impacts of construction activities on retained native vegetation and habitat should be addressed in the Construction Environmental Management Plan. An Ecological Management Plan should be prepared to guide removal of vegetation, including recommendations for vegetation management.
- Tree branches and leaves should not be closer to a powerline than the distance specified in 'ISSC 3 Guideline for Managing Vegetation Near Power Lines' (Industry Safety Steering Committee, 2005)
- Any gas service to be installed is to be in accordance with AS/NZS 1596:2008 The storage and handling of LP gas (Standards Australia, 2008)
- Provide landscaping in accordance with Landscape Plans prepared by Terras Landscape Architects (Appendix 6).

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 skeletal remains are discovered cease work immediately and contact OEH and NSW Police.

10.9 Visual

No additional measures are considered necessary.

10.10 Social

- Surveillance opportunities outside of normal school hours may be improved through the use of night patrols or other organised security services
- Details regarding proposed access control measures such as locks and alarms particularly for the building entries and windows along the southern elevation should be determined prior to construction
- Landscaping treatments will limit opportunity for 'ladders' (e.g. horizontal slats or climbable building elements and locating climbable vegetation) that might assist gaining entry to buildings
- Landscaping maintenance will promote natural surveillance with pruning of low branches to approximately 2 metres high, and the pruning of ground cover and hedges at around waist height
- Signage should clearly identify uses and any access restrictions, and assist with wayfinding to reduce 'excuse making' behaviour
- Department of Education standard maintenance procedures will be implemented to ensure timely repair of damaged property and lighting, and 'rapid removal' approach to graffiti
- Graffiti resistant materials and surface treatments will be used where possible
- Lighting will provide continuous illumination to car parking areas. Motion activated lighting is appropriate around other areas of the site where natural surveillance from public spaces is limited. Lighting will promote surveillance, aid identification, and mitigate potential entrapment or hiding areas
- Activation based lighting will be used in areas of the site that do not have high levels of natural surveillance from a public space
- External lighting will be directed toward approaches to buildings rather than illuminating observers or vantage points (windows and doors)
- Student lockers will be provided to help protect personal items such as mobile phones, money and key cards
- A post construction review will occur to confirm implementation of measures and identify additional suitable measures
- Stage construction activities in order to minimise the area of contaminated soils exposed at any one time
- Provide temporary covers over exposed contaminated soils where capping cannot be completed in a timely fashion to minimise exposure risks
- Conduct higher risk work (i.e. stripping and exposure of contaminated soils) outside school hours (where practical).

10.11 Economic

No additional measures are considered necessary.

10.12 Waste Management

- Prepare a Waste Management Plan
- Determine volumes and nature of material to be removed from site, including potential for recycling,
- Site remediation and management will be conducted in accordance the Remediation Action Plan (Appendix 31).
- Additional investigation for contamination will also occur following demolition of site structures in order to confirm remediation 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 "The Blue Book",* Landcom

(2004) and Aurecon plan (Appendix 14) with regard to recommendations of Douglas Partners Report on Targeted Site Investigation for Contamination (Appendix 13)

- 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.

10.13 Chemical and Fuel Storage

- 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
- An 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.

11. CONCLUSION AND JUSTIFICATION FOR THE PROPOSAL

The Hunter Sports High School currently operates at the site with approximately 850 students. The proposed redevelopment of the school is not aimed at accommodating additional staff or teachers, but will provide state of the art educational facilities. Existing buildings are ageing and do not currently meet the needs of modern education practices or some building standards. Construction will occur over two years and will be staged to allow ongoing use of the school grounds and facilities.

The option of not proceeding with the redevelopment has been considered, however would result in long term maintenance issues for the aged building stock. An alternative location or minor upgrades to the school were also considered and would not meet the educational needs of the school and is not considered the best use of the site that already benefits from existing substantial infrastructure and services associated with the educational use.

The development is consistent with the principles of ecologically sustainable development. There is unlikely to be significant impact on the environment as a result of the proposed development provided environmental mitigation measures proposed in Section 10 of this EIS are adopted. The proposal will not have a significant impact on the environment, including threatened species, populations or ecological communities, or their habitats. Approval is not required under the EPBC Act.

12. REFERENCES

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APPENDICES

APPENDIX 1

Location Plan

APPENDIX 2

Aerial Photograph

APPENDIX 3

Zoning Plan

APPENDIX 4

Capital Investment Value prepared by RPS

APPENDIX 5

Architectural Plans prepared by EJE Architecture

APPENDIX 6

Landscape Plans prepared by Terras Landscape Architects

APPENDIX 7

Conditional Approval from Mine Subsidence Board

APPENDIX 8

Minutes of Pre-Lodgement Concept Meeting with Lake Macquarie City Council

APPENDIX 9

Arborist Report prepared by Terras Landscape Architects

APPENDIX 10

Bushfire Protection Assessment prepared by EcoLogical Australia

APPENDIX 11

Biodiversity Assessment Report prepared by Biosis

APPENDIX 12

Report on Geotechnical Investigation prepared by Douglas Partners

APPENDIX 13

Report on Preliminary Site Investigation and Targeted Site Investigation by Douglas Partners

APPENDIX 14

Stormwater Management Plan prepared by Aurecon

APPENDIX 15

Extract from Jewells Wetland Flood Study 2013 provided by Lake Macquarie City Council

APPENDIX 16

Accessibility Review prepared by Philip Chun

APPENDIX 17

Traffic and Parking Impact Assessment and Supplementary Information prepared by McLaren Traffic Engineering

APPENDIX 18

RMS Consultation

APPENDIX 19

Crime Risk Assessment Report prepared by de Witt Consulting

APPENDIX 20

NSW Air Quality Statement 2015 prepared by Office of Environment & Heritage

APPENDIX 21

Aboriginal Heritage Information System Search Results

APPENDIX 22

Pre-Construction BCA Review prepared by NewCert

APPENDIX 23

Milestone Drawings

APPENDIX 24

3D Render

APPENDIX 25

Bike and Car Parking Arrangement

APPENDIX 26

Construction Noise and Vibration Management Plan prepared by Muller Acoustic Consultants

APPENDIX 27

Department of Education Position on Car Parking prepared by NSW Public Works

APPENDIX 28

List of Chemicals in 2015

APPENDIX 29

Protected Matters Search Results

APPENDIX 30

Graphical Visual Impact Comparison prepared by EJE Architecture

APPENDIX 31

Remediation Action Plan prepared by Douglas Partners

APPENDIX 32

Secretary's Environmental Assessment Requirements