E T H O S U R B A N

Environmental Impact Statement

1669-1732 Elizabeth Drive, Badgerys Creek Stage 1: Bulk Earthworks Elizabeth Enterprise Precinct

Submitted to Penrith City Council On behalf of Mirvac Projects Pty Ltd

09 May 2019 | 218005



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LTS Lockley

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- S Pre-DA Meeting Minutes Penrith City Council

Statement of Validity

Development Application Details				
Applicant name	Mirvac Projects Pty Ltd			
Applicant address	Level 28, 200 George Street, Sydney NSW 2000			
Land to be developed	1669-1732 Elizabeth Drive, Badgery	s Creek, Lot 5 of DP860456		
Proposed development	Bulk earthworks and filling as descril Environmental Impact Statement	bed in Section 3.0 of this		
Prepared by				
Name	Christopher Curtis	Emily Hatfield		
Qualifications	BUrbanEnvPlan, DipPM	B.DesSt, M.Arch		
Address	173 Sussex Street, Sydney			
In respect of	Designated Development Application	1		
Certification				
Certification				
Certification	I certify that I have prepared the con knowledge:	tent of this EIS and to the best of my		
Certification	I certify that I have prepared the con knowledge: it is in accordance with Schedule 2 of Assessment Regulation 2000;	tent of this EIS and to the best of my f the Environmental Planning and		
Certification	I certify that I have prepared the con knowledge: it is in accordance with Schedule 2 of Assessment Regulation 2000; all available information that is releva of the development to which the stat	tent of this EIS and to the best of my of the Environmental Planning and ant to the environmental assessment ement relates; and		
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Certification Signature Name	I certify that I have prepared the con knowledge: it is in accordance with Schedule 2 of Assessment Regulation 2000; all available information that is releva of the development to which the state the information contained in the state Christopher Curtis	tent of this EIS and to the best of my of the Environmental Planning and ant to the environmental assessment ement relates; and ement is neither false nor misleading. Emily Hatfield		

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Executive Summary

Purpose of this Report

This submission to Penrith City Council comprises an Environmental Impact Statement (EIS) for a Development Application under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It relates to development proposed at 1669-1732 Elizabeth Drive, Badgerys Creek. The proposed development involves the importation, placement and compaction of general fill materials including onsite ancillary cut to fill works involved with achieving the bulk earthworks levels as detailed within the AT&L Civil Engineering documentation.

The proposed development intends to utilise fill generated offsite from large State Significant and Sydney based infrastructure and building projects. The proposed spoil reuse to support the development of a circular economy is at core in alignment with the objectives and planning priorities within the Greater Sydney Commission's *A Metropolis of Three Cities* and *Western City District Plan*.

The proposed development is permissible with consent under the Infrastructure SEPP and is classified as Designated Development under Schedule 3 of the Environmental Planning and Assessment Regulations 2000 (EP&A Regulation). Under Clause 32(1)(d) of Schedule 3 in the EP&A Regulation, the project constitutes a Waste Management Facility that is located within 100m of a natural waterbody, being South Creek, and also within 250m of a dwelling house not associated with the development. Accordingly, the proposed development is Designated Development and requires the preparation of an EIS.

A request for the issue of Secretary's Environmental Assessment Requirements (SEARs) was sought on 21 December 2018. Accordingly, the SEARs were issued on 20 February 2019. This submission is in accordance with Schedule 2 of the EP&A Regulation and is lodged under Part 4 of the EP&A Act, and addresses the issues raised in the SEARs.

Overview of the Project

The Development Application (DA) seeks approval for:

- The demolition and removal of existing rural structures;
- · Heritage salvage works, subject to a separate s140 permit and an AHIP being obtained, if required;
- · Clearing of existing vegetation on the subject site and associated dam dewatering and decommissioning;
- The importation, placement and compaction of spoil material, consisting of;
 - Virgin Excavated Natural Material (VENM) within the meaning of the POEO Act; and/or
 - Excavated Natural Material (ENM) within the meaning of the NSW EPA's Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014 – The Excavated Natural Material Order 2014; and/or
 - Materials covered by a specific NSW EPA Resource Recovery Order and Exemption which are suitable for their proposed use.
- · Ancillary onsite cut to fill bulk earthworks associated with the disposal of spoil;
- · Connection and augmentation of services and utilities to the site; and
- Construction of stormwater, erosion and sediment control systems.

No land uses or buildings/structures associated with future land uses are proposed.

The proposed works are consistent with the *A Metropolis of Three Cities – the Greater Sydney Region Plan*, in that the bulk earthworks contribute to the future development of the site for employment purposes, consistent with the broader strategic vision as detailed in the Greater Sydney Region Plan, namely by facilitating future development that is complementary of the future Western Sydney Airport and the Aerotropolis. Future development as facilitated by the proposed development will have the potential to generate employment-based uses, supporting growth in employment and associated economic activity as envisaged for the Aerotropolis.

The location of the Western Sydney Airport within the Western City, combined with the Aerotropolis investment under the Western Sydney City Deal, creates an opportunity for a Western Economic Corridor to be established, supporting the growth of the broader Sydney region. With the site being located within the Corridor, and the intention of the proposed filling works to prepare for future employment uses on the site, these bulk earthworks are therefore consistent with, and support, the goals and objectives of the Western City District Plan which clearly identifies the role of land surrounding the Airport as appropriate for employment purposes. This is further supported through the Western Sydney Airport Land Use and Infrastructure Implementation Plan that recognises the importance of complementary land uses (including employment land) near to and adjacent the Airport, to establish the Aerotropolis as the centre of the Western City.

The Site

The site is located at 1669-1732 Elizabeth Drive, Badgerys Creek within the Penrith City Council Local Government Area (LGA), approximately 15km south-east of the Penrith CBD and 40km west of the Sydney CBD.

The site is within proximity of the future Western Sydney Airport, approximately 800m west of the site and the within Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan Stage 1 (WSA LUIIP) area, partially located within the Badgerys Creek and South Creek Precincts.

The site is legally described as Lot 5 of DP860456 with an area of approximately 54.41ha. The site is irregular in shape, with a frontage to Elizabeth Drive (southern boundary) of approximately 540m and an access road (western boundary) of approximately 590m. The site's eastern boundary of approximately 1.6km is formed by the alignment of South Creek, while the northern boundary of approximately 1km abuts adjoining rural lands.

Planning Context

Section 5.3 of the EIS considers all applicable legislation in detail. The proposal is consistent with the requirements of all relevant SEPPs. The site is zoned RU2 – Rural Landscape and E2 – Environmental Conservation noting works are occurring within the RU2 Rural Landscape zone only. The proposal is permissible with consent and meets the objectives of the subject zone.

Environmental Impacts and Mitigation Measures

This EIS provides an assessment of the environmental impacts of the project in accordance with the SEARs and sets out the undertakings made by Mirvac Projects Pty Ltd to manage and minimise potential impacts arising from the development.

Stormwater and Flooding

The proposed development is located on lands which are identified as flood affected under the PLEP 2012, given the site's proximity to South Creek. The proposed development has been designed to reduce the extent of works within areas of the site that are flood effected. In assessing potential impacts of flooding, the site has been divided into two areas:

- Stage 1A Limited to land above the PMF extent; and
- Stage 1B Generally limited to the land above the 100 yr ARI flood extent (the area between PMF and 100 yr ARI)

Land within the Stage 1A area is not identified as flood affected and was therefore not assessed. Land within the Stage 1B area is identified as flood affected. The proposed works will result in an adverse local increase of the flood level within the southern corner of the Stage 1B area, associated within the filling of the area which deflects flow back towards South Creek. Further, the proposed works will result in an increase of flood velocities adjacent the eastern boundary of Stage 1B, however the scale of change more confined that the extent of flood level changes.

Notwithstanding the potential flooding impacts associated with development in the Stage 1B area, it is noted that the proposed works as sought under this application relate to earthworks, therefore no habitable development or high-risk uses are proposed.

Air Quality

Dust emissions will be generated during construction of the project, mainly through the bulk earthworks phase. Potential dust emission sources during construction works include:

- · Wind-generated dust from disturbed surfaces and stockpiles; and
- Wheel-generated dust and particulate matter emissions in diesel exhaust emissions from on-site plant and equipment and construction traffic movements.

The general area itself has been given a sensitivity rating of low for dust soiling and low for health effects, due to its rural setting, with a low risk rating of adverse impacts in terms of dust soiling and human health effects at the off-site sensitive receiver locations, if no mitigation measures were implemented. However, to manage potential impacts on sensitive receivers from dust and emissions, a range of mitigation measures are proposed including site preparation and maintenance, vehicle movement emission control and dust emission management.

Noise and Vibration

Construction activities will generally occur during standard construction hours in accordance with the EPA's Interim Construction Noise Guideline (ICNG) recommended standard hours, with noise generated through the use of heavy equipment and machinery. This will impact on sensitive receivers including nearby residential properties to the south of the site. A range of specialised mitigation measures are proposed which include ongoing monitoring of noise levels and letterbox drops.

The main vibration generating equipment to be used at the site will include trucks during operation and rollers and dozers during the bulk earthworks phase of the project.

The nearest structure to the site is located approximately 50m from its boundary. Subsequently, it is considered that vibration levels from the proposed works will be below the criteria for 'minimal risk of cosmetic building damage' at the nearest residential neighbour.

Heritage

There are two items of locally listed heritage values under the Penrith LEP 2010 identified within 650m-1km of the site, however none identified on the site. The land containing the study area was the location of James Badgery's landholdings, who used the land for farming purposes. It was on this land that Badgery established 'Exeter Farm'. The impact on these items is considered negligible in terms of visual amenity on the heritage values.

Furthermore, four Aboriginal sites and three Potential Archaeological Deposits were identified on the site. A total loss of value would occur due to the proposed works.

More detailed archival research is required to prepare an archaeological research design to be submitted with an application for a s139 exception or a s140 permit for test excavation. This process will be undertaken outside of this development application.

Visual Impact

The site is situated on land that is generally flat with low rolling topography, sloping down towards the site's alignment with South Creek. The land is identified as a 'rural landscape' with areas aligning with South Creek identified as a 'creek corridor'.

The proposed development involves a change to the existing landform. Given the scale of change, visual impacts of a moderate to high degree are associated with the proposal. While the landform will be permanent, it is noted that visual impacts associated with the proposed works are temporary pending future development on the site, subject to a separate application. Accordingly, the proposed landform will be temporarily undeveloped, consisting of exposed earth.

While the proposed development will result in a moderate-high visual impact on surrounding receivers, these impacts are considered appropriate given their temporary nature and the consistency of the proposal with the broader vision for the area, including the future development of employment lands, open space, roads and other civil infrastructure. Mitigation measures relating to temporary visual impacts are proposed including the perseveration of existing road planting and the selection of appropriate vegetation.

Conclusion and Justification

The EIS addresses the SEARs, and the proposal provides for the proposed bulk earthworks and fill importation on the site. The potential impacts of the development are acceptable and are able to be managed. The proposed spoil reuse to support the development of a circular economy is at core in alignment with the objectives and planning priorities within the Greater Sydney Commission's *A Metropolis of Three Cities* and *Western City District Plan*. Given the planning merits of the proposal, the proposed development warrants approval by Penrith City Council.

1.0 Introduction

This Environmental Impact Statement (EIS) is submitted to the Penrith City Council pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in support of an application for Designated Development located at 1669-1732 Elizabeth Drive, Badgerys Creek (the site).

The proposed development is classified as Designated Development under Schedule 3 of the Environmental Planning and Assessment Regulations 2000 (EP&A Regulation). Under Clause 32(1)(d)(i) of Schedule 3 in the EP&A Regulation, the project constitutes a Waste Management Facility that is located within 100m of a natural waterbody. Accordingly, the proposed development is Designated Development and requires the preparation of an EIS.

The report has been prepared by Ethos Urban on behalf of Mirvac Projects Pty Ltd, and is based on the Civil Engineering Plans prepared by AT&L (see **Appendix C**) and other supporting technical information appended to the report (see Table of Contents).

This EIS has been prepared in accordance with the requirements of Part 4 of the EP&A Act, Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), and the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of the EIS, which are included at **Appendix A**. This EIS should be read in conjunction with the supporting information and plans appended to and accompanying this report.

1.1 Overview of Proposed Development

This application seeks approval for the following development:

- The demolition and removal of existing rural structures;
- Heritage salvage works, subject to a separate s140 permit and an AHIP being obtained, if required;
- · Clearing of existing vegetation on the subject site and associated dam dewatering and decommissioning;
- The importation, placement and compaction of spoil material, consisting of;
 - Virgin Excavated Natural Material (VENM) within the meaning of the POEO Act; and/or
 - Excavated Natural Material (ENM) within the meaning of the NSW EPA's Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014 – The Excavated Natural Material Order 2014; and/or
 - Materials covered by a specific NSW EPA Resource Recovery Order and Exemption which are suitable for their proposed use.
- · Ancillary onsite cut to fill bulk earthworks associated with the disposal of spoil;
- · Connection and augmentation of services and utilities to the site; and
- Construction of stormwater, erosion and sediment control systems.

No land uses or buildings/structures associated with future land uses are proposed.

The proposed development is further described in Section 3.0.

1.2 Background to the Development

The site is located within a broader area undergoing significant transition from existing rural and agricultural lands to the Western Sydney Aerotropolis. Given the site's proximity to the future Western Sydney Airport, the site is strategically placed to accommodate future flexible employment uses associated with the airport and Western Sydney, through the development of the Elizabeth Enterprise Precinct (EEP). This is demonstrated by the site's inclusion within the Western Sydney Airport Land Use and Infrastructure Implementation Plan (refer to Section 5.4.3) and State Environmental Planning Policy (Western Sydney Employment Area) 2009 (refer to Section 5.3.3). These plans are underpinned by the objectives and priorities of both the *A Metropolis of Three Cities – the Greater Sydney Region Plan* (refer to Section 5.4.1) and its associated *Western City District Plan* (refer to Section 5.4.2), both prepared by the Greater Sydney Commission.

Notwithstanding the above, the use of the site currently remains rural as specified in the Penrith Local Environmental Plan 2012 (refer to **Section 5.3.8**).

The proposed development is also subject to the availability of virgin excavated natural material (VENM) and excavated natural material (ENM). Both VENM and ENM are generated by various subterranean infrastructure projects throughout NSW, including Sydney Metro (Northwest and Southwest) and Westconnex. The proposed development provides an appropriate means of disposal of VENM and ENM using a suitable approvals process.

1.3 Secretary's Environmental Assessment Requirements

In accordance with section 4.39 of the EP&A Act, the Secretary of the Department of Planning and Environment issued the requirements for the preparation of the EIS on 20 February 2019. **Table 1** provides a detailed summary of the individual matters listed in the SEARs and identifies where each of these requirements have been addressed in this report and the accompanying technical studies. A copy of the SEARs are included in **Appendix A**.

Table 1	Secretary's Environmental Assessment Requirement
Table I	Secretary's Environmental Assessment Requirement

Requirements	Section Addressed	Supporting Technical Study (Appendix)			
General					
The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.	This EIS has been prepared in accordance with the relevant clauses of the Environmental Planning and Assessment Regulation 2000.				
Key Issues					
 The EIS must include an assessment of all potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must also be addressed: strategic context - including: a detailed justification for the proposal and suitability of the site for the development; a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies; strategic justification for the proposal with regards to the Western Sydney Aerotropolis - Land Use and Infrastructure Implementation Plan Stage 1: Initial Precincts, and a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out. 	Strategic justification for the proposal is included in Section 5.4 . The proposed development's consistency with applicable environmental planning instruments and development control plans is included in Section 5.3 . The proposed development's consistency with the Western Sydney Aerotropolis - Land Use and Infrastructure Implementation is included in Section 5.4.3 . Mitigation measures for potential impacts of the development are provided in Section 8.0.				
 waste management - including: details of the type, quantity and classification of waste to be received at the site; details of waste handling including, transport, identification, receipt, stockpiling and quality control; and the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21. 	Waste management is addressed in Section 6.3 .	The proposed development is supported by a Waste Management Plan, prepared by SLR and included in Appendix H .			
 erosion and sediment control - including: measures implemented to prevent any impact on adjoining properties and infrastructure from the cut and fill earthworks being undertaken; measures implemented to mitigate potential impacts to South Creek; and 	Erosion and sediments control are addressed in Section 6.2.	The proposed development is supported by a Civil Drawings and Civil report, prepared by AT&L and included in Appendix C and			

Re	quirements	Section Addressed	Supporting Technical Study (Appendix)
•	erosion and sediment control measures are to be consistent with the Landcom Blue Book, Managing Urban Stormwater Soils and Construction (Vol 14th ed. 2004)		Appendix D respectively.
			The proposed development is also supported by a Flood Impact Assessment, prepared by Cardno and included in Appendix G .
so	il and water - including: a description of local soils, topography, drainage and landscapes:	Soils and water are addressed in Section 6.2.	In respect of soils and water, the proposed
•	details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000;		development is supported by the following technical
•	an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment;		Flood Impact
٠	a detailed site water balance;		Assessment, prepared
•	an assessment of potential impacts on the quality and quantity of surface and groundwater resources;		by Cardno and included in Appendix G.
•	details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts;		Erosion and Sediment Control Plan, prepared by AT&L and included
٠	characterisation of the nature and extent of any contamination on the site and surrounding area; and		in Appendix C.
•	a description and appraisal of impact mitigation and monitoring measures.		
tra •	ffic and transport - including: a traffic impact assessment in accordance with Roads and Maritime Services guidelines;	Traffic and transport impacts associated with the proposal are addressed in	The proposed development is supported by a
٠	details of road transport routes and access to the site;	Section 6.4.	Management Plan.
٠	road traffic predictions for the development during the proposed works and operation;		prepared by Ason Group and included in
•	an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development; and		Appendix K.
•	plans demonstrating how all vehicles associated with the proposed works and operation awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network.		
air •	quality and odour - including: a quantitative assessment of the potential air quality, dust and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines. This is to include the identification of existing and potential future sensitive receivers and consideration of approved and/or proposed developments in the vicinity; and a description and appraisal of air quality impact mitigation and monitoring measures.	Air quality and odour is addressed in Section 6.5	The proposed development is supported by a Air Quality Impact Assessment, prepared by SLR and included in Appendix N.
ha	zards and risk - including:	The risk and impacts of	The proposed
•	an assessment of the risk of bushfire, including addressing the requirements of Planning for Bush Fire Protection 2006 (RFS) or its replacement. Any proposed Asset Protection Zones must not adversely affect environmental objectives (e.g. buffers);	bushfire associated with the proposed are addressed in Section 6.11.1	development is supported by a Bushfire Assessment, prepared by ABPP and included
•	any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations to address this; and	Geotechnical limitations relating to the proposal are	in Appendix Q.
•	an assessment of flood risk on the site. The assessment should determine: the flood hazard in the area; address the impact of flooding on the proposed development, and the development's impact (including filling) on flood behaviour of the site and adjacent lands; and address adequate egress and safety in a flood event.	6.11.2 Flooding and flood risk are addressed in Section 6.11.3	development is supported by a Geotechnical Investigation, prepared by Pells Sullivan

Requirements	Section Addressed	Supporting Technical Study (Appendix)		
		Meynink and included in Appendix P .		
		The proposed development is supported by a Flood Risk Assessment, prepared by Cardno and included in Appendix G		
 noise and vibration - including: a quantitative assessment of noise and vibration impacts during the proposed works and from transport in accordance with relevant Environment Protection Authority guidelines. This is to include the identification of existing and potential future sensitive receivers and consideration of approved and/or proposed developments in the vicinity; details and justification of the proposed noise mitigation and monitoring measures; and specify the times of operation for all phases of the development and for all noise producing activities. 	Noise and vibration impacts associated with the proposed development are addressed in Section 6.6 Construction management relating to the proposal is addressed in Section 3.9	The proposed development is supported by a Construction Noise and Vibration Assessment, prepared by SLR and included in Appendix O .		
 biodiversity - including: assessment of biodiversity impacts in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR). 	Biodiversity and riparian impacts are addressed in Section 6.7	The proposed development is supported by a Biodiversity Development Assessment Report, prepared by EcoLogical and included in Appendix F .		
 contamination – including; a detailed assessment of the extent and nature of any contamination of the soil, groundwater and marine sediments; 	Impacts associated with contamination are addressed in Section 6.8	The proposed development is supported by a Contamination Assessment, prepared by JBS&G and included in Appendix L .		
 heritage – including; including Aboriginal (preparation of an Aboriginal Cultural Heritage Assessment Report) and non-Aboriginal cultural heritage items and values of the site and surrounding area in accordance with the relevant Office of Environment and Heritage guidelines. 	Impacts relating to environmental heritage are addressed in Section 6.10	The proposed development is supported by a Statement of Heritage Impact (Appendix J) and Archaeological Survey Report (Appendix I), prepared by Artefact		
 visual – including; including an impact assessment at private receptors and public vantage points with consideration given to Elizabeth Drive and its role as a key boulevard traversing the Aerotropolis and as a potential road link into Western Sydney Airport. 	Visual impacts associated with the proposed development are included in Section 6.9	The proposed development is supported by a Visual Impact Assessment, prepared by Clouston Associates and included in Appendix R .		
Environmental Planning Instruments and other policies				
 The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to: State Environmental Planning Policy (Infrastructure) 2007; State Environmental Planning Policy (Western Sydney Employment Area) 2009; State Environmental Planning Policy No 33 - Hazardous and Offensive Development; 	The proposed development's consistency with applicable policies, environmental planning instruments and development control plans is included in Section 5.0			

Requirements	Section Addressed	Supporting Technical Study (Appendix)	
 State Environmental Planning Policy No 55 - Remediation of Land; Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2-1997); A Metropolis of Three Cities; Western City District Plan; Western Sydney Aerotropolis - Land Use and Infrastructure Implementation Plan - Stage 1: Initial Precincts; Penrith Local Environmental Plan 2010; and relevant development control plans and section 7 .11 plans.) 			
Guidelines			
During the preparation of the EIS you should consult the Department's Register of Development Assessment Guidelines which is available on the Department's website at planning.nsw.gov.au under Development Proposals/Register of Development Assessment Guidelines. Whilst not exhaustive, this Register contains some of the guidelines, policies, and plans that must be taken into account in the environmental assessment of the proposed development.		een incorporated into the	
Consultation			
During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with the: • Environment Protection Authority; • Office of Environment and Heritage; • Department of Primary Industries; • Department of Industry; • Department of Industry; • Department of Planning and Environment - Aerotropolis Activation • Roads and Maritime Services; • WaterNSW; • Rural Fire Service; • Fire & Rescue NSW; • Penrith City Council; • Liverpool City Council; and • the surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultation carried out and issues raised must be included in the EIS.	Consultation is addressed in Section 1.4.		
Further consultation after 2 years			
If you do not lodge an application under Section 4.12(8) of the Environmental Planning and Assessment Act 1979 within 2 years of the issue date of these SEARs, you must consult with the Planning Secretary in relation to any further requirements for lodgement.	-	-	

1.4 Consultation

As part of the preparation of the EIS, several agencies have been consulted with as summarised in Table 2 below.

Table 2 Consultation activities

Agency	Consultation	
Environment Protection Authority (EPA)	The EPA were consulted during the SEARs request and provided the following response: "Based on the information provided, the EPA does not believe the proposed works trigger environment protection licensing under Schedule 1 of the Protection of the Environment	

Agency	Consultation
	Operations Act 1997 (POEO Act). Therefore, the EPA will not be providing SEARs for this proposal"
	No further consultation is proposed to be undertaken with the EPA.
Office of Environment and Heritage	A phone call occurred on Friday 15 th March 2019. OEH advised that all comments were provided as part of the SEARs. No further consultation is to be undertaken with OEH.
Department of Industry / Natural Resources Access Regulator (NRAR)	Response to SEARs issued 15 February 2019. No further consultation to date
Department of Planning and Environment - Aerotropolis	This team has now been embedded within the Planning Partnership.
Activation	Mirvac met the Planning Partnership on 21 March 2019.
Roads and Maritime Services	Meetings have been held with RMS on 10 December 2018 and 4 February 2019. A phone call occurred on Wednesday 8 th May 2019 to Pahee Rathan from RMS who advised no further consultation required for this application. An email has been issued to RMS (Pahee Rathan) to gain formal response. Awaiting response. A copy of this EIS package will be issued to the RMS for comment upon request.
WaterNSW	A phone call occurred on Thursday 28 th March 2019. WaterNSW (Alison Kniha) advised a copy of information to be issued to WaterNSW to confirm if consultation is required. Project summary issued to WaterNSW 8 th May 2019. A copy of this EIS package will be issued to WaterNSW for comment upon request.
RFS / Fire & Rescue NSW	A phone call occurred on Wednesday 8 th May 2019. RFS advised no comment given no buildings, infrastructure and/ or structures are proposed as part of this application. Email issued to RFS development's assessment team to confirm if any further consultation is required. Awaiting confirmation. A copy of this EIS package will be issued to the RFS for comment upon request.
Penrith City Council	Pre-lodgement meeting held with Penrith City Council on 27 November 2018. Council's comments have been addressed throughout this application.
Liverpool City Council	A phone call occurred on Thursday 9 th May 2019 to Penrith City Council Development Services Team who confirmed that Penrith City Council will provide notification to Liverpool City Council as part of the Development Assessment. Therefore, no further consultation required with Liverpool City Council prior to lodgement of EIS.
Surrounding landowners	Consultation to be undertaken as part of exhibition process with all surrounding landowner comments to be addressed in the Response to Submissions.

1.5 Integrated Development

The proposed development is 'integrated development' in accordance with Clause 91 of the EP&A Act. In addition to development consent, the development requires a controlled activity approval (CAA) in accordance with section 91 of the *Water Management Act 2000* (WMA 2000) as the proposal involves works within 'waterfront land' associated with the subdivision within 40m of a water course, being South Creek to the east of the works.

2.0 Site Analysis

2.1 Site Location and Context

The site is located at 1669-1732 Elizabeth Drive, Badgerys Creek within the Penrith City Council Local Government Area (LGA). The site is located approximately 15km south-east of the Penrith CBD and 40km west of the Sydney CBD.

The site is also located within proximity of the future Western Sydney Airport, located approximately 800m west of the site as shown in **Figure 1**. Further, the site is also identified within the area subject to the WSA LUIIP, partially located within the Badgerys Creek and South Creek Precincts. The site is also located within and adjacent to identified corridors associated with the future airport and the Western Sydney Aerotropolis. These include the construction and upgrade of roads including the M12 and M9 motorways, and the construction of a new North South rail link.



Figure 1 The site within its surrounding context

Source: Google, edits by Ethos Urban

2.2 Site Description

The site is legally described as Lot 5 of DP860456. The site's area is approximately 54.41ha. The site is irregular in shape, with a frontage to Elizabeth Drive (southern boundary) of approximately 540m and an access road (western boundary) of approximately 590m. The site's eastern boundary of approximately 1.6km is formed the alignment of South Creek, while the northern of approximately 1km abuts adjoining rural lands.

Existing development on the subject site consists of a single storey farm shed located towards the site's western boundary, surrounded by smaller storage sheds. Surrounding this built form are paddocks utilised for grazing. Several dams are located within the subject site. The site's primary access is via Elizabeth Drive, with a driveway located 50m east of the Elizabeth Drive and Martin Road intersection. Access to the site is also provided by a driveway off the public access road which runs along the site's western boundary, located approximately 340m north of the road's intersection with Elizabeth Drive.

A survey plan is located at Appendix B. An aerial photo of the site is shown at Figure 2.



Figure 2 Aerial photograph identifying the site extents and the immediate surrounds

Source: Nearmap, edits by Ethos Urban



 Figure 3
 View of site looking east, riparian lands in background

 Source: Ethos Urban



 Figure 4
 The site's western boundary (looking north) and frontage to existing access way

 Source: Ethos Urban



 Figure 5
 The site's western boundary (looking south) and frontage to existing access way

 Source: Ethos Urban



 Figure 6
 View of the south-west extent of the site

 Source: Ethos Urban
 View of the south-west extent of the site



 Figure 7
 The site's frontage to Elizabeth Drive at South-west boundary

 Source: Ethos Urban
 Source: Ethos Urban



Figure 8 The site's frontage to Elizabeth Drive and existing access driveway, along the site's southern boundary

Source: Ethos Urban



 Figure 9
 Riparian Plantings associated with South Creek

 Source: Ethos Urban



 Figure 10
 Riparian lands of South Creek, as viewed from the neighbouring site further east

 Source: Ethos Urban

2.2.1 Topography

The site slopes from west to east, with its highest points located at the site's south-west boundary (approximately RL 63.71), sloping towards the site's eastern boundary (approximately RL 38.09). This results in an east-west crossfall of approximately 25m, noting the site is located adjacent the South Creek alignment. The site is generally undulating, assisting the creation of various farm dams throughout the site (as illustrated in **Figure 2**).

2.2.2 Vegetation

Vegetation on the subjects site consists of grassed paddocks with some established trees and shrubs. Significant riparian vegetation associated with South Creek is concentrated along the site's eastern boundary. Within the site are three native Plant Community Types, being:

- PCT 725 Broad-leaved Ironbark Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion;
- PCT 849 Grey Box Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion; and
- PCT 1071 Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion.

PCT 835 – Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion is present within the study area however is not located on the site.

PCT 849 features the critically endangered ecological community (CEEC) Cumberland Plain Woodland in the Sydney Basin Bioregion (CPW). PCT 835 features the endangered ecological community (EEC) River Flat Eucalypt Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregion. These Plant Type Communities are known habitats of the Cumberland Plain Land Snail and Green and Golden Bell Frog, which are identified threatened species, however no specimens were recorded on the site as part of the targeted survey.

2.2.3 Soils and Ground Condition

The proposed development supported by a Geological Investigation Report prepared by Pells Sullivan Meynink, included in **Appendix P**. A study of 13 test pits and 8 boreholes within the site found that the soils are generally in the following conditions (refer to **Table 3**). A detailed description of soils is included in **Section 6.2**.

Table 3 Summary of general soil condit	able 3	Summary o	f general	soil	conditio
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Inferred Unit	Inferred Top of Unit Depth Below Ground Surface (m)	Description
Topsoil	0.0	Clayey sand to sandy clay.
Fill	0.0	Sandy clay to gravelly clay and ripped shale fill.
Natural Soil	0.1 to 5.5	Clayey sand to clay and Gravelly clay.
Bedrock	1.0 to 8.5	Shale and Sandstone

Source: Pells Sullivan Meynink

The report also finds that no indicators of salinity were observed during a site inspection. This is attributed to the site being covered by grasses and vegetation. Further, groundwater was not observed in any of the test locations. The location of test pits and boreholes are shown in **Figure 36**.

2.2.4 Heritage and Archaeology

The proposed development is supported by a Non-Aboriginal Statement of Heritage Impact (SOHI) and an Archaeological Survey Report (ASR) prepared by Artefact and included in **Appendix I** and **J**.

The site is not identified as an item of local or State heritage significance under the Penrith LEP 2010. Notwithstanding this, the site is understood as having potential heritage value as it contains the former location of Exeter Farm (and farmhouse), which was once occupied by James and Elizabeth Badgery. The site was visited by Governor Macquarie in 1810. However, it is noted that the original farm house has since been demolished.

The ASR indicates the potential for Aboriginal archaeological items within the site, given the site's proximity to South Creek. Heritage and potential impacts associated with the proposed works are is addressed in **Section 6.10**.

2.3 Surrounding Development

Development surrounding the site predominantly consists of rural/agricultural lands and various industrial developments.

To the north of the site continues agricultural lands including grassed paddocks and established crops. Located to the north-west of the subject site is the SUEZ Resource Recovery centre, incorporating earthworks and treatment ponds. Further north of the site, approximately 7km, is rural residential community within the suburb of Erskine Park and WaterNSW Warragamba pipelines infrastructure running in an east-west direction.

Located immediately east of the subject site is South Creek, a significant watercourse within western Sydney. The South Creek alignment forms the eastern boundary of the site. Located further east of the site are agricultural lands with established crops, some industrial development and rural-residential communities within the suburb of Kemps Creek. These typologies of development continue further east.

Immediately south of the site are industrial developments associated with the surrounding agricultural lands. Located further south of the site are agricultural lands, some industrial development and rural-residential communities within the suburb of Badgerys Creek. Further south-west of the subject site are the lands identified for the future development of the WSA. Works associated with the WSA have begun, with various earthworks noted within the WSA site. Surrounding development is shown in **Figure 11** to **Figure 16**.



 Figure 11
 Intersection of Mamre Road and Abbott Road, located north-east of the site

 Source: Ethos Urban



 Figure 12
 Signposted property 149A Elizabeth Drive, located east of the site

 Source: Ethos Urban
 Source: Ethos Urban



 Figure 13
 Entry to Kemps Creek Quarry, located east of the site

 Source: Ethos Urban
 Source: Ethos Urban



 Figure 14
 Industrial development east of the site

 Source: Ethos Urban



 Figure 15
 Construction of Western Sydney Airport, located west of the site

 Source: Ethos Urban



 Figure 16
 Rural dwelling located west of the site

 Source: Ethos Urban
 Vision

3.0 Description of the Development

The proposed development seeks approval for the waste management works that incorporates the following:

- The demolition and removal of existing rural structures;
- · Heritage salvage works, subject to a separate s140 permit and an AHIP being obtained, if required;
- · Clearing of existing vegetation on the subject site and associated dam dewatering and decommissioning;
- The importation, placement and compaction of spoil material, consisting of;
 - Virgin Excavated Natural Material (VENM) within the meaning of the POEO Act; and/or
 - Excavated Natural Material (ENM) within the meaning of the NSW EPA's Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014 – The Excavated Natural Material Order 2014; and/or
 - Materials covered by a specific NSW EPA Resource Recovery Order and Exemption which are suitable for their proposed use.
- · Ancillary onsite cut to fill bulk earthworks associated with the disposal of spoil;
- · Connection and augmentation of services and utilities to the site; and
- Construction of stormwater, erosion and sediment control systems.

No land uses or buildings/structures associated with future land uses are proposed.

A site plan of the proposed development is illustrated in Figure 17.

The works are proposed to occur in two stages:

- Stage 1A: filling works will be completed above the existing PMF extent; and
- Stage 1B: filling works will be completed between the existing PMF extent and the existing 100-year flood extent.

Staging of works is further outlined within Section 3.9.1.



Figure 17 The proposed filling works

Source: AT&L

3.1 **Development Objectives**

The proposed development is supported by the following development objectives, which consider the reason for the proposed works, the intent of the works and the assumed outcome. The overarching development objective is to:

Provide waste management for the disposal of clean fill and prepare the site for future development consistent with the objectives of the WSA LUIIP and overarching aims for the Aerotropolis

In particular, the proposed works will:

- Support the development of a circular economy through the re-use of fill generated offsite from large State Significant and Sydney based infrastructure and building projects;
- Align with the planning priorities outlined within the Greater Sydney Commission's 'A Metropolis of Three Cities - Greater Sydney Region Plan' (GSRP), 'Western City District Plan' (WCDP) and Department of Planning and Environment's 'Land Use and Infrastructure Implementation Plan (WSA LUIIP)'; and
- Support the future activation of the South Creek corridor.

3.2 **Bulk earthworks importation**

Table 4

The key numeric development information is summarised in Table 4.

Table 4 Bulk earthwor	rk details			
Component		Proposal		
Site area		54.41ha		
Bulk Earthworks				
Stage 1A (To PMF extent)				
Cut Volume		-452,157m ³		
Fill Volume		670,247m ³		
Net Balance		218,090m ³ (importation)		
Stage 1B (To 1 in 100-year flood extent)				
Cut Volume		0m ³		
Fill Volume		430,934m ³		
Net Balance		430,934m ³ (importation)		
Total (Stage 1A and 1B)				
Cut Volume		-452,157m ³		
Fill Volume		1,101,181m ³		
Net Balance		649,023m ³ (importation)		
Transportation				
Capacity of Vehicle		13t single truck, 30t truck and dog		
Average fill importation trucks	arriving to the site per hour	60 in/60 out (120 total) during peak movements		
Total truck movements (in and	d out) per day	300 in/300 out per day maximum		

Note the final requirement for fill importation may change as detailed design works are finalised as specified within the Civil Engineering documentation contained within Appendix C and Appendix D. The proposed finish levels correspond to anticipated road layouts throughout the site subject to future approvals, however these can be readily amended as part of future DAs for subdivision infrastructure and urban design layouts for the site.

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3.2.1 Cut and fill works

Approximately 649,023m³ of fill material is to be imported to make up the bulk of fill material to be used on site.

The site will be benched to provide large flexible future development pads with approximately 452,157m³ of existing surface material to be 'cut'. This work relates mainly to the western portion of the site. This material will be reused as fill material. Other portions of the site are also required to be moderately excavated

The proposed transportation and placement of fill will be undertaken during standard construction hours. Rigid heavy vehicles and 'truck and dog' semi- trailers will be used to import the fill to the site.

Imported fill material will be obtained from outside the site and will be validated as Virgin Excavated Natural Material (VENM) within the meaning of the POEO Act or Excavated Natural Material (ENM) within the meaning of the NSW EPA's Resource Recovery Exemption or material that meets a specific NSW EPA Resource Recover Order and Exemption which are suitable for their proposed use.

3.2.2 Earthworks and compaction of fill

The placement, compaction, inspection and testing of fill will be completed in accordance with the Bulk Earthworks specification provided by PSM as contained within **Appendix P**.

A Geotechnical Inspection and Testing Authority (GITA) shall be contracted to document and certify that the works undertaken have been completed in accordance with the relevant design and specifications. The GITA shall adopt Level 1 responsibility as described in Section 8.2 of the AS 3798-2007 'Guidelines on earthworks for commercial and residential developments".

3.3 Construction Hours

All works will be undertaken within the following timeframes:

•	Monday to Friday (other than Public Holidays):	7:00am – 6:00pm
•	Saturday:	8:00am – 1:00pm
•	Sunday & Public Holidays:	No works to be undertaken

The above timeframes are in accordance with the Department of Environment & Climate Changes Interim Construction Noise Guideline.

Any works to be undertaken outside of the standard construction hours shall be required to obtain an Out of Hours (OOH) approval; any such works would necessarily be undertaken in accordance with the appropriate OOH protocols and approval procedures.

3.4 Construction Activities

Key construction activities to be undertaken during the works are outlined below, associated with the relevant activity group:

- Enabling Works
 - Pre-commencement documentation / approvals
 - Community notification of construction commencement
 - Archaeological salvage works (if required)
 - Relocation of flora and fauna species (if required)
 - Dam decommissioning
 - Establishment of survey control
 - Utility relocations / terminations at selected locations

- Minor clearing works
- Minor topsoil stripping
- Construction of minor access roads
- Construction access formalisation
- Investigative drilling (if required)
- Dwelling demolition works
- Site Establishment
 - Clearing of vegetation and stockpiling of mulch materials
 - Progressive construction of sedimentation and erosion controls as required, including construction of diversion catch drains along the project formation
 - Establishment of construction on-site compound
 - Installation of temporary construction signage and lighting
 - Fencing of construction areas and site compounds
- Bulk Earthworks
 - Stripping of topsoil and stockpiling for reuse in batter stabilisation
 - Progressive construction of sedimentation and erosion controls as required
 - Excavation of cutting and stockpiling of better-quality materials to be used as select fill
 - Construction of fill embankments including foundation drainage
 - Placement and compaction of selected material
 - Importation, placement and compaction of VENM/ENM materials to meet earthworks balance requirements

3.4.1 Enabling and site preparation

Located within the site are four existing dams. Site preparation works will involve the dewatering of all dams within the site.

Given the scale of VENM/ENM disposal, site preparation works will also incorporate the construction of temporary roads and structures throughout the site, including toilets, a work shed and a lunchroom for workers on-site.

3.4.2 Vegetation Clearing

The proposed development includes the clearing of existing vegetation within the site. This includes the removal of established trees and shrubs which are located throughout the site. It is noted that riparian vegetation associated within the alignment of South Creek will remain. Within the site, trees are concentrated around the existing homestead and access paths.

3.5 Waste Identification Process

The placement, compaction, inspection and testing of fill will be completed in accordance with the Bulk Earthworks specification provided by PSM as contained within **Appendix H**.

The management of unexpected finds will be managed in accordance with the Unexpected Finds Protocol to be prepared and approved by the Certifying Authority prior to commencement of works.

3.5.1 Type of Fill

The following import materials are proposed:

• Virgin Excavated Natural Material (VENM) within the meaning of the POEO Act; and/or

- Excavated Natural Material (ENM) within the meaning of the NSW EPA's Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014 – The Excavated Natural Material Order 2014; and/or
- Materials covered by a specific NSW EPA Resource Recovery Order and Exemption which are suitable for their proposed use.

3.5.2 Extent of Fill

The spoil is to be placed entirely within the bounds of Lot 5 DP860456.

The full extent of the proposed cut and fill including depths across the site are shown at Figure 17.

3.6 Access

The proposed works involve the transportation of approximately 649,023m³ of spoil to be deposited on the site. Material will be sourced from various projects throughout greater Sydney. Accordingly, the proposed importation haulage works will be undertaken in accordance with a Construction Traffic Management Plan (prepared by Ason Group and included in **Appendix K**).

The excavated material proposed to be deposited on the site will be transported via a range of trucks – including trucks as small as 7-tonne trucks up to truck-and-dog type vehicles (with a capacity of 30 tonnes per load). It is anticipated that there will be approximately 100 truck movements (of varying size) per day (50 in / 50 out) during the demolition phase, and 600 truck movements (300 in/ 300 out) per day during the bulk earthworks. Approximately 50 light vehicles would access the site each day (50 in / 50 out), with these vehicle movements likely outside peak periods in the local network.

Trucks will approach the site on Elizabeth Drive from the east before making a right turn into the existing public access road. A right turn movement will then be made from the access road to enter the site. Exiting the site trucks will turn left from the site onto the access road, followed by a left turn onto Elizabeth Drive. All unloading of trucks will occur within the site boundaries. A haulage road will be provided on the site to facilitate access to the filling works. The haulage road will consist of hard durable gravel with a sealed surface. There are two proposed vehicle access routes:

- Route 1 (Primary): M7 to Elizabeth Drive and then the access road (and vice versa): and
- Route 2 (Secondary): M7 to the M4, then The Northern Road, Elizabeth Drive and the access road (and vice versa).





Source: Ason Group

3.7 Stormwater Management

The final landform post-completion of the filling works will be developed in a manner that enables overland flows to be maintained across the site towards South Creek to the east. The final landform of the site is shown within the Civil Engineering Plans at **Appendix C**.

3.8 Site rehabilitation, closure and end of use

As defined under schedule 3 of the EP&A Regulation, 'landfill' or 'bulk earthworks' constitutes a 'waste management facility'. This type of characterisation is ordinarily associated with disposal of putrescible or contaminated waste whereby the post closure management of the site's use as a waste management facility is of considerable importance.

However, as an activity which requires filling to be undertaken as part of the site preparation works as distinct from the ongoing storage of waste, the use of 'clean inert fill' does not require any ongoing waste management that would ordinarily be associated with a 'waste management facility or work'.

The Engineering Plans at **Appendix C** show the finalised levels and layout of the site at the completion of the proposed works. Landscaping of individual allotments over the site will be undertaken as part of future and separate applications.

3.9 Construction Management

Between 25 and 50 workers would be on-site during the importation and compaction of fill. This includes on-site equipment operators and sub-contractors, as well as people associated with importation of fill. Staff will be able to park on site in designated areas.

3.9.1 Construction Staging

It is currently proposed to undertake Stages 1A and 1B concurrently. However, due to the quantum of fill material required for the proposal and the fluctuating nature of the spoil market, earthworks have been staged as follows:

- Stage 1A: Importation, placement and compaction of VENM/ENM and ancillary cut/fill earthworks above the PMF extent. The total importation requirement for this stage is approximately 218,090m³; and
- Stage 1B: Importation, placement and compaction of VENM/ENM generally between the Stage 1A extent and the 100-year flood extent. The total importation requirement for this stage is approximately 430,934m³.

In addition, staging of the proposed works as per the above has been selected to ensure Stage 1B works are coordinated with the Penrith City Council South Creek flood study and Floodplain Risk Management Plan forecast for public exhibition in September 2019.


Figure 19 Proposed earthworks staging

Source: AT&L

3.9.2 Vehicular Access and Site Security

Access to the site off the access road would be restricted by a security gate. At the entry point, a temporary compound would be constructed to accommodate construction worker and visitor vehicles.

The site will be fenced during work as shown on the Engineering Plans at **Appendix C**. Construction works barriers, fences and site hoardings will be maintained as required.

3.9.3 Delivery Standards for Vehicles

All vehicles will be required to follow strict road delivery standards, which will be outlined in the Construction Traffic Management Plan contained within **Appendix K**. These standards include:

- following all applicable road rules and laws at all times;
- not use mobile phones while driving;
- following designated haul routes;
- · restraining and covering of loads; and
- utilising the shake down/wash areas before leaving the site to prevent migration of dust and soil to the surrounding local road network.

3.9.4 Complaints Handling

A Complaints Handling Procedure will be prepared prior to works. This will include keeping a complaint register to receive, log, track and monitor responses to the complaints during the project lifecycle.

3.9.5 Equipment

The final equipment is subject to contractor engagement and selected staging of works.

The following equipment is expected to be used for the bulk earthworks and compaction works:

- Mobile crane;
- Backhoe;
- Skid-steer;
- Ute;
- Generator (5kVA);
- Scraper;
- Excavator;
- Wheel Loader;
- Mulcher;
- Truck & dog vehicles
- Sweeper truck;

- Vacuum truck;
- · Crusher;
- Processor;
- 988 wheel loader;
- 40 tonne excavator;
- 15,000 litre water cart;
- 35 tonne offroad dumpers;
- · Compactors;
- Dozer;
- · Grader; and
- Roller.

4.0 Analysis of Alternatives

This proposal seeks to prepare the site for future development consistent with the objectives of the WSA LUIIP and overarching aims for the Aerotropolis.

Throughout the design evolution and environmental assessment of the project a number of options and alternatives were presented and considered to make the site suitable for future development envisaged by the LUIIP. The development of the project was driven by the focus to provide the most appropriate design response to the environmental opportunities and constraints of the site.

4.1 Strategic need for the proposal

The proposed works will ultimately give rise to the development of the site for complementary employment uses as part of the EEP, in support of the WSA and aerotropolis. Given the scale of the broader EEP, its location and its strategic importance to multiple stakeholders, the proposed bulk earthworks on site represents a key strategic outcome in that it will assist in preparing the land for the facilitation of future development consistent with the intentions of the LUIIP and broader Aerotropolis. The provision of a waste management for the disposal of clean fill and the associated bulk earthworks are the first step in the delivery of orderly development of the land and utilising surplus fill material from large State Significant and Sydney based infrastructure and building projects, to contribute to facilitating:

- new jobs and employment that will help the Aerotropolis grow into its role;
- opportunities for growth in smart jobs related to the key strengths established under the LUIIP;
- transformation of a significant section of the South Creek corridor into a useable and enjoyable space by refocusing development and public spaces along the creek edge; and
- a master planned, coordinated redevelopment opportunity that is unique to the EEP site will compliment and accelerate the growth of the Aerotropolis as the WSA grows.

4.2 Alternative Options

Options to facilitate the outcomes desired by the LUIIP on the site and obtain fill from large State Significant and Sydney based infrastructure and building projects were considered. Alternatives for the project are considered below.

4.2.1 Do nothing

Doing nothing would increase the development timeframes and cost for future Aerotropolis development. It would also potentially require fill to be sourced not from spoil from major infrastructure projects but from less sustainable sources such as extractive industries.

4.2.2 Alternative use

There are no realistic alternative uses for the site given its strategic designation for future employment in the LUIIP and proposed future zoning process.

4.2.3 Delaying the works

Delaying filling works until the future would result in the ability to source fill to be reduced significantly, noting that currently there is a surplus of clean fill materials from large State Significant and Sydney based infrastructure and building projects being available in the market.

4.2.4 The Proposal

The proposal is the most appropriate option to be undertaken at this time due to the availability of fill from large State Significant and Sydney based infrastructure and building projects. Obtaining the fill now and placing on the site will reduce the construction timeframes associated with redevelopment of the site for uses consistent with the intended outcomes under the LUIIP to support the WSA.

5.0 Planning Context

5.1 Commonwealth Legislation

The Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires approval from the Commonwealth Minister for the Environment for actions that will have a significant effect on matters of national environmental significance, including identified threatened species. The proposed development does not impact upon any identified threatened species listed under the EPBC Act. Therefore, the proposal will not have a significant impact on matters of national environmental significance as listed in the EBPC Act and accordingly, a referral is not required to the Commonwealth Minister for the Environment.

5.2 State Legislation

5.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act applies to all development in New South Wales and sets out the procedures and objects for all development. Section 4.10 of the EP&A Act relates to designated development and refers applicants to the EP&A Regulation.

5.2.2 Environmental Planning and Assessment Regulation 2000

Schedule 2 of the EP&A Regulation sets out procedures which relate to the preparation and submission of Environmental Impact Statements. This EIS has been prepared in accordance with Clauses 6 and 7 of Schedule 2 which relate to the form and content of the EIS.

Further, the EP&A Regulation specifies development that is Designated Development. As set out in **Section 1.1** the proposal constitutes a Waste Management Facility that is located within 100m of a natural waterbody and within 250m of an unrelated residential dwelling under Clause 32(1)(d) of Schedule 3 in the EP&A Regulation.

5.2.1 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 protects threatened species, communities and critical habitat in NSW. It provides protection for species, populations and ecological communities considered endangered and vulnerable.

The site contains three Plant Community Types (PCTs) which are to be cleared for the proposed development. As the area of native vegetation to be cleared is greater than 0.25 ha, the area threshold for the NSW Biodiversity Offset Scheme is passed. A Biodiversity Development Assessment Report (BDAR), consistent with the NSW Biodiversity Conservation Act 2016 (BC Act) and Biodiversity Assessment Method (BAM), has been prepared.

The assessment completed within the BDAR (**Appendix F**) identified direct impacts on 0.69ha of Broad-leaved Ironbark, 1.63ha of Grey Box-Forest Red Gum and 0.85ha of Coastal Freshwater Wetlands. This requires a total of 44 ecosystem credits to be retired, and a further 31 credits for residual impacts on 2.48ha of Southern Myotis.

5.2.2 Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 (POEO Act) regulates operations which have the potential to harm the environment. Schedule 1 of the POEO Act specifies development that is classified as a scheduled activity. Pursuant to Schedule 1 Clause 39(2)(e), the proposed development is not classified as a scheduled activity (Waste Disposal (application to land)) as it will involve the storage of VENM or ENM only, subject to the general exemption on the site. Clause 34 (resource recovery) also does not apply due to the imported material waste being VENM or meeting the conditions of a resource recovery order.

If material is identified as ENM, the ENM Exemption will apply and no licence will be required for the proposed activity. If in the event the excavated material is not classified as VENM, ENM or materials covered by a specific NSW EPA Resource Recovery Order and Exemption, the waste will not be accepted by the proponent and therefore not transported to the site. An Imported Fill Proposal has been prepared by JBS&G at **Appendix M**.

5.2.3 Water Management Act 2000

The proposed development requires a controlled activity approval under s91 of the *Water Management Act 2000* for works on waterfront land as it proposes filling works within the 40m buffer zone surrounding South Creek. These works mainly relate to battering of the proposed fill.

5.3 Statutory Planning Instruments and Policy

The site is partially located within the RU2 Rural Landscape zone with the remainder of the site within the E2 Environmental Conservation zone.

Development for the purposes of the disposal of virgin excavated natural material is prohibited under the Penrith Local Environmental Plan 2010 (PLEP 2010) in both the RU2 Rural Landscape zone, or the E2 Environmental Conservation zone. The PLEP 2010 is discussed further in **Section 5.3.8**.

Accordingly, the proposed development relies on both the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) and State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 in determining the permissibility of the proposed development on the site. This is further discussed below.

5.3.1 State Environmental Planning Policy (Infrastructure) 2007

Clause 121(3) of the State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) states the following:

"(3) Development for the purpose of the recycling of construction and demolition material, or the disposal of virgin excavated natural material (within the meaning of Schedule 1 to the **Protection of the Environment Operations Act 1997)** or clean fill, may be carried out by any person with consent on which development for the purpose of industries, extractive industries of mining may be carried out with consent under any environmental planning instrument."

(Our emphasis)

Clause 121(1) of the ISEPP states the following:

"(1) Development for the purpose of **waste or resource management facilities,** other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone."

(Our emphasis)

In this case, Clause 120 of the Infrastructure SEPP designates RU2 Rural Landscape as a prescribed zone. It is noted that E2 Environmental Conservation is not a prescribed zone. The Infrastructure SEPP also notes that waste or resource management facilities have the same meaning as the Standard Instrument, under which they are defined as follows:

"waste or resource management facility means any of the following:

(a) a resource recovery facility,

(b) a waste disposal facility,

(c) a waste or resource transfer station,

(d) a building or place that is a combination of any of the things referred to in paragraphs (a)– (c)."

Under this definition, the proposal would be considered a waste disposal facility, which comprises the following:

"waste disposal facility means a building or place used for the disposal of **waste by landfill**, incineration or other means, including such works as recycling, resource recovery and other resource management activities, energy generation from gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal."

(Our emphasis)

Given that the proposed development would result in the use of the site as a disposal of waste (by landfill), the proposal would also be permissible by virtue of this pathway.

5.3.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

In respect of Clause 121(3) of the ISEPP, the proposed development is permissible by virtue of Clause 7 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007, which states the following:

"Development for the any of the following purposes may be carried out with development consent: (a) **extractive industry on land on which development for the purposes of agriculture or**

industry may be carried out (with or without development consent),"

(Our emphasis)

Under the RU2 Rural Landscape zone, agriculture is a permissible use. The impact of this is that extractive industries are a permissible use, and by extension of this, the disposal of virgin excavated natural material can be undertaken at the site within the RU2 zoned land. It is noted that the E2 Environmental Conservation zone does not permit agriculture as a use, and therefore the above does not apply to this portion of the site.

5.3.3 State Environmental Planning Policy (Western Sydney Employment Area) 2009

The site is located within the Western Sydney Employment Area (WSEA). The WSEA is located 50km west of the Sydney CBD and consists of eleven (11) identified precincts. The site is located within Precinct 11 - Broader Western Sydney Employment Area. Formation of the WSEA is intended to provide employment lands in line with the broader growth in the Western Sydney area.

The applicable planning instrument for this area is State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP). Despite its identification within the WSEA SEPP, the instrument does not zone land in the Broader Western Sydney Employment Area Precinct.

5.3.4 State Environmental Planning Policy (Western Sydney Aerotropolis)

The site will be identified within the future State Environmental Planning Policy (Western Sydney Aerotropolis) (WSA SEPP), expected to be gazetted in 2019. Pending its gazettal, the Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan (as further discussed in **Section 5.3.4**) informs aspects of the WSA SEPP which are relevant to the proposal. Specifically, the WSA LUIIP details the application of land uses within the WSA SEPP. These include the following land uses:

- Urban Development zone
- Infrastructure zone
- Environmental zone

The site is identified as being within a future Urban Development Zone and Environment Zone under the WSA LUIIP. The aims of the Urban Development Zone are:

- Implement the objective of the Western Parkland City objectives in accordance with the Greater Sydney Region Plan;
- Manage the transition of non-urban land into urban land in a way that is consistent with the requirements of this Plan;
- Ensure the development of well-planned and well-serviced, high-amenity and culturally vibrant new urban communities in accordance with this Plan and future precinct plans; and
- Ensure a range and location of uses that can build the social fabric of new communities and consistent with the strategic planning for the Aerotropolis.

The proposed development is consistent with these objectives in that it will facilitate the transition from non-urban land to urban lands, through site preparation works that will facilitate future development that is consistent with the broader visions as detailed in the WSA LUIIP.

5.3.5 State Environmental Planning Policy No 33 – Hazardous and Offensive Development

State Environmental Planning Policy No. 33 — Hazardous and Offensive Development (SEPP 33) provides a systematic approach to planning and assessing proposals for potentially hazardous and offensive development for the purpose of industry or storage. SEPP 33 applies to any proposals which fall under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'. The works are not considered to fall within these definitions.

5.3.6 State Environmental Planning Policy No 55 – Remediation of Land

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) provides that a consent authority must not consent to the carrying out of development on land unless:

- (a) it has considered whether the land is contaminated, and
- (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
- (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

A detailed assessment is included below at **Section 6.8**. The proposed development is supported by a Preliminary Site Investigation as prepared by JBS&G and including in **Appendix L**.

For this proposal, any remediation works required would be Category 2 under SEPP 55 and therefore not require consent.

5.3.7 Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River (No 2 -1997)

The Sydney Regional Environmental Plan No 20 - Hawkesbury-Nepean River (No 2-1997) (SREP 20) applies to the site. SREP 20 seeks to ensure that the potential impacts to Hawkesbury-Nepean River as caused by development are considered in a regional context.

The general planning considerations prescribed in SREP 20 have been assessed against the proposed development. Part 3 of SREP 20 specifies development controls for works within the SREP area. In accordance with Clause 11(7) of SREP 20, the proposed works are 'Filling'. As the proposed development includes filling of greater that 1m in depth and affecting an area greater than 100m, consent is required.

The proposal satisfies the aim SREP 20 as the potential impact of the project has been assessed in a regional context. SREP 20 also suggests that any feasible alternatives should be considered. A consideration of the alternatives has been undertaken (see Section 1.2) and it has been identified that there is not any other feasible, or more attractive, alternative proposal for the site considering the benefits which the project entails.

Another consideration prescribed in SREP 20 is the relationship between the potential impacts of the development and the environment, and how the impacts will be addressed and monitored. The monitoring of the potential impacts will also be undertaken throughout the life of the project through management plans.

5.3.8 Penrith Local Environmental Plan 2010

The Penrith Local Environmental Plan 2010 (PLEP 2010) is the primary planning instrument effecting the site, in respect of zoning and development permissibility. Under the PLEP 2010, the site is zoned RU2 – Rural Landscape and E2 – Environmental Conservation, as illustrated in **Figure 20**. Development for the purposes of fill storage by way of a waste management facility is prohibited in both the RU2 Rural Landscape and E2 - Environmental Conservation. However, as described in **Section 5.3.2**, permissibility is available through the Infrastructure SEPP and the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007, being higher-order planning instruments.



Figure 20 Extract form Penrith LEP 2012 – Land Use Zone

Source: Penrith Local Environmental Plan 2012

The PLEP 2010 specifies the following development controls for the site.

Table 5 Summary of applicable development controls as specified in the PLEP 2010			
Clause	Assessment		
4.1 - Minimum subdivision lot size	The site is zoned as requiring a minimal lot size of 40.0ha.		
	The proposed development does not include the subdivision of the existing site. Accordingly, no change to the existing lot size is proposed.		
4.2 - Rural subdivision	The proposed development does not include the subdivision of the existing site. Accordingly, no change to the existing lot size is proposed.		
5.10 - Heritage conservation	The site does not include items of local or State heritage significance.		
5.11 - Bush fire hazard reduction	The site is identified as being affected by bushfire, with both Vegetation Category 1 and Vegetation Category 2 identified within the site. Bushfire is addressed in Section 6.11.1 .		
7.1 - Earthworks	The proposed development incorporates earthworks across the site. The management of the proposed earthworks is discussed in Section 3.2 .		
7.2 - Flood planning	The site is identified as a Flood Planning Area under the PLEP 2010. Flooding and stormwater management is further addressed in Section 6.1 .		
7.5 - Protection of scenic character and landscape values	The site is identified as Land with Scenic and Landscape Values under the PLEP 2010. Visual impacts associated with the proposed development is addressed in Section 6.9 .		
7.9 - Development of land in the flight paths of the site reserved for the proposed Second Sydney Airport	The proposed development is largely consistent with the applicable policies, strategies and Directions relating to Western Sydney Airport in that it is preparing the site for future development as complementary employment land.		

5.3.9 **Penrith Development Control Plan 2010**

The Penrith Development Control Plan 2010 applies to lands within the Penrith LGA which is incorporated within the PLEP 2010. The PDCP 2010 provides detailed provisions for development on the site and describes its application to lands within the WSEA.

The PDCP 2010 includes principles for development within the Penrith LGA. These include:

- Provide a long-term vision for cities, based on sustainability; intergenerational, social, economic and political 1. equity; and their individuality;
- 2. Achieve long term economic and social security. Recognise the intrinsic value of biodiversity and natural ecosystems, and protect and restore them;
- Enable communities to minimise their ecological footprint; 3.
- 4. Build on the characteristics of ecosystems in the development and nurturing of healthy and sustainable cities;
- 5. Recognise and build on the distinctive characteristics of cities, including their human and cultural values, history and natural systems;
- 6. Empower people and foster participation:
- 7. Expand and enable cooperative networks to work towards a common, sustainable future;
- Promote sustainable production and consumption, through appropriate use of environmentally sound 8. technologies and effective demand management; and
- Enable continual improvement, based on accountability, transparency and good governance. 9.

The proposed development represents enabling works that will facilitate future development that is consistent with multiple PDCP 2010 principles. The proposed earthworks will facilitate future employment and environmental uses on the site, consistent with the strategies discussed throughout Section 5.3. Specifically, the proposed development will assist in achieving principles relating to economic development/security and ecological/environmental value.

A summary of the applicable development controls and an assessment of the proposed development's compliance with these controls is detailed in Table 6 and in the relevant section in Section 6.

Control	Assessment			
C1 Site Planning and Design Princ	C1 Site Planning and Design Principles			
1.1.2. Key Areas with Scenic and Landscape Values	The site is identified with within the PLEP 2010 as having Scenic and Landscape Values. A Visual Impact Assessment in support of the proposed has been prepared by Clouston and included in Appendix R . Visual Impact is further addressed in Section 6.9			
1.2.4. Responding to the Site's Topography and Landform	The proposed development will result in a substantial change to the topography of the existing site. It is noted that the proposed development does not incorporate built form, therefore, an assessment of future built forms' response to topography will be addressed within future applications. The extent of works is described in Section 3.0 . The proposed development's effect on Soils and Water is discussed in Section 6.2			
C2 Vegetation Management				
2.1. Preservation of Trees and Vegetation	The proposed development will incorporate the removal of trees in order to facilitate earthworks. The proposed development is supported by a Biodiversity Development			
2.2. Biodiversity Corridors and Areas of Remnant Indigenous Vegetation in Non- Urban Areas	Assessment Report prepared by Ecological and included in Appendix F . Impacts on the proposed development in respect of biodiversity is further is addressed in Section 6.7 .			
2.3. Bushfire Management	The proposed development is within lands that are identified as prone to bushfire risk. The proposed development is supported by a Bushfire Assessment Report as prepared by Australian Bushfire Protection Planners and included in Appendix Q .			

	Table 6	Summary of devel	opment controls as	specified in the	Penrith Develo	pment Control Plan 2	010
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Control	Assessment	
C3 Water Management		
3.1. The Water Cycle/Water Conservation	The proposed development is located within proximity of South Creek. Further, the proposed modification of the natural ground level will modify the existing water cycles	
3.2. Catchment Management and Water Quality	within the area. The proposed development is supported by numerous studies in assessment in respect of water management and discussed throughout this assessment. Specifically:	
3.3. Watercourses, Wetlands and Riparian Corridors	Stormwater and Flooding is addressed in Section 6.1 Soils and Water is addressed in Section 6.2 Biodiversity (riparian corridors) is addressed in Section 6.7	
3.4. Groundwater	The proposed development is located within proximity of South Creek. The proposed development is supported by a Geotechnical Investigation undertaken by Pells Sullivan Meynink and included in Appendix P . Soils and Groundwater are addressed in Section 6.2	
3.5 Flood Planning	The site is identified by the PLEP 2010 as being flood affected. However, the proposed	
3.6. Stormwater Management and Drainage	works are wholly contained within portions of the site that are not identified as flood affected. Flood risk is further addressed in Section 6.1 and stormwater management is addressed in Section 6.1 . Provisions of stormwater management are detailed in the Civil	
3.7. Water Retention Basins/Dams	Drawings prepared by AT&L, included in Appendix C.	
C4 Land Management		
4.1. Site Stability and Earthworks	The proposed development earthworks that will result in significant modifications to the existing ground plane. The extent of the proposed earthworks is detailed in the Civil Drawings prepared by AT&L (Appendix C) and further described in Section 3.2 . Additionally, Geotechnical investigations in respect of the proposed development is addressed in Section 6.11.2 with supporting studies found in Appendix P .	
4.2. Landfill	The proposed development involves the disposal of VENM/ENM on the site in facilitating the proposed earthworks. The proposed earthworks are detailed in the Civil Drawings prepared by AT&L (Appendix C) and further described in Section 3.2 . The use of VEMN/ENM generally satisfies the criteria specified in the PDCP 2010. The composition of soils is addressed in Section 3.2.2 .	
4.3. Erosion and Sedimentation	 The proposed development incorporates provisions of erosion and sediment control as detailed in the Civil Drawings prepared by AT&L (Appendix C). The proposed development is supported by numerous studies in assessment in respect of erosion and sediment control. Specifically: Stormwater and Flooding is addressed in Section 6.1 Soils and Water is addressed in Section 6.2 	
4.4. Contaminated Lands	The proposed development involves the use of VENM/ENM as part of the proposed earthworks. The use of VENM/ENM involves the appropriate certification of potential contaminants prior to its deposit on the site. With respect to the existing site, the proposed development is supported by a Contamination Assessment, prepared by JBS&G and included in Appendix L . Contamination is further addressed n Section 6.8	
4.5. Salinity	The proposed development is supported by Geotechnical investigations as prepared by Pells Sullivan Meynink. Soil Salinity is addressed in Section 6.2	
C5 Waste Management		
5.1. Waste Management Plans	The proposed development incorporates the disposal of VENM/ENM on the site.	
5.2. Development Specific Controls	Accordingly, the proposed development is supported by a Waste Management Plan, prepared by SLR and included in Appendix H . Waste Management is addressed in	
5.3. General Controls	Section 6.3	
5.4. Hazardous Waste Management		
5.5. On-Site Sewage Management		
C6 Landscape Design		
6.1 Controls	The proposed development represents works that will facilitate future development on the site. Therefore, landscaping works will be incorporated within the future applications related to civil works and the construction of built form.	

Control	Assessment	
C7 Culture and Heritage		
7.1. European Heritage	No items of local or State heritage significance have been identified on the site. However, items of heritage significance are identified within the surrounds and potential for archaeological items within the site. The proposed development is supported by a Statement of Heritage Impacts and Archaeological Survey, prepared by Artefact and included in Appendix I and Appendix J . Heritage Impacts is addressed in Section 6.10	
7.2. Aboriginal Culture and Heritage		
7.3. Significant Trees and Gardens	The proposed development involves the clearing of some vegetation to facilitate the proposed earthworks. Impacts associated with this clearing are addressed in Section 6.7 .	

5.4 Strategic Policy

5.4.1 A Metropolis of Three Cities – the Greater Sydney Region Plan

A Metropolis of Three Cities – the Greater Sydney Region Plan (GSRP) was released by the Greater Sydney Commission (GSC) in 2018. The GSRP takes a long-term view of changes in policy, trends, directions, and actions that will inform planning and development for the Greater Sydney area for the next 30 years. The plan's vision is underpinned by the concept of a three-city metropolis that enhances Greater Sydney's liveability, productivity and sustainability. This will also be supported through greater infrastructure provision and collaboration throughout the region.

Notably, the WSA is the key catalyst for growth within Western Sydney – described by the GSRP as the 'Western Parkland City'. While the WSA is fundamental to the revisioning of the region, the plan describes growth within the region as being supported by a 'polycentric city' model, capitalising on the established centres of Liverpool, Penrith and Campbelltown-Macarthur. The plan further details the importance of the Western Sydney City Deal and its role in supporting investment within the region, collectively supporting the Western Economic Corridor – underpinned by industries such as defence and aerospace, trade and freight, logistics and manufacturing, health, education and sciences.

To support the vision of boosting Greater Sydney's liveability, productivity and sustainability, the GSC have established ten (10) directions which establish the aspirations for Greater Sydney over the next 40 years. These are:

- 1. A city supported by infrastructure providing infrastructure to support new developments to increase 30-minute access to a metropolitan centre;
- A collaborative city working together to grow Greater Sydney including the increased use of public resources such as open space and community facilities;
- 3. A city for people celebrating diversity and focusing on people, through increasing walkability to local centres
- 4. Housing the city providing housing choices with increase housing completions and the implementation of Affordable Rental Housing Target Schemes
- 5. A city of great places designing places for people and providing increased access to open space
- 6. A well-connected city developing a more accessible and walkable city, focusing on a high percentage of dwellings within a 30-minute public transport area of a centre
- 7. Jobs and skills for the city creating conditions for a stronger economy through increasing jobs in metropolitan and strategic centres
- 8. A city in its landscape valuing green spaces and landscape and improving urban tree canopy cover and an expanded Greater Sydney Green Grid
- 9. An efficient city using resources wisely to reduce transport-related greenhouse gas emissions and reducing energy use per capita; and
- 10. A resilient city adapting to a changing world with standardised state-wide natural hazard information.

While the proposed development's primary function will be the disposal of VENM and ENM on the site, this embodies site preparation works that will benefit future development on the site. Therefore, the proposed development is consistent with the broader strategic vision as detailed in the GSRP, namely by facilitating development that is complementary of the future WSA and the Aerotropolis. Future development as facilitated by the proposed development will have the potential to generate employment-based uses, supporting growth in employment and associated economic activity as envisaged for the Aerotropolis.

Objectives

Supporting the ten directions, the GSRP specifies 40 objectives in achieving greater liveability, productivity and sustainability throughout Greater Sydney. Specifically, the proposed development assists in achieving the following objectives:

- Objective 2: 'Infrastructure aligns with forecast growth growth infrastructure compact';
- Objective 3: 'Infrastructure adapts to meet future needs';
- Objective 5: 'Benefits of growth realised by collaboration of governments, community and business';
- Objective 6: 'Services and infrastructure meet communities' changing needs';
- · Objective 13: 'Environmental heritage is conserved and enhanced';
- Objective 20: 'Western Sydney Airport and Badgerys Creek Aerotropolis are economic catalyst for Western
 Parklands City'
- · Objective 22: 'Investment and business activity in centres';
- Objective 25: 'The coast and waterways are protected and healthier';
- Objective 30: 'Urban tree canopy cover is increased';
- Objective 31: 'The Green Grid links parks, open spaces, bushland and walking and cycling paths';
- Objective 34: 'Energy and water flows are captured, used and re-used';
- Objective 36: 'People and places adapt to climate change and future shocks and stresses'; and
- Objective 37: 'Exposure to natural and urban hazards is reduced'.

5.4.2 Western City District Plan

Supporting the objectives of the GSRP are actions and priorities as detailed in a suite of region-specific plans known as the District Plans, released by the GSC in March 2018. The subject site is located within the Western City District. As with the Region Plan, the Western City District Plan (WCDP) places significant emphasis on the WSA as a driver for growth within the region, supported by the established centres of Liverpool, Penrith and Campbelltown-Macarthur.

The provision of the WSA within the Western City, combined with the Aerotropolis investment under the Western Sydney City Deal (WSCD), creates an opportunity for a Western Economic Corridor as described within the GSRP and supported through the WCDP. This corridor would consider the development opportunities arising from a North South Rail Link, from St Marys to the WSA and Aerotropolis, and providing east-west transport links. The creation of new major centres to take advantage of local economic activity along these transport corridors would contribute to the creation of new jobs in a wide and diverse range of fields. The proposed development is therefore located within the Western Economic Corridor. As discussed throughout the assessment, the proposed development embodies site preparation works that will facilitate future development in line with the broader vision for the Western Economic Corridor.

5.4.3 Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan

The Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan – Stage 1 Initial Precincts (WSA LUIIP) was released by the Department of Planning and Environment (DPE) in August 2018. Prepared in response to the broader vision as detailed in GSRP the WSA LUIIP provides a foundation for consultation between stakeholders within the region, enabling a collective approach in the delivery of the Western Sydney Aerotropolis.

Stage 1 of the WSA LUIIP includes a Structure Plan, identifying key precincts and their associated land uses. The site is located within two (2) of the proposed precincts within the LUIIP, being:

- · Badgerys Creek Precinct; and
- South Creek Precinct.

The WSA LUIIP employs a staged approach and delivering Initial Precincts, such as the Aerotropolis Core, Northern Gateway (located west of the subject site) and South Creek are understood as priorities in future precinct planning. Neither Badgerys Creek or Kemps Creek Precinct are identified as 'Initial Precincts'. Notwithstanding this, initial precinct planning as detailed in the WSA LUIIP identifies land uses for the subject site.

The site is identified to accommodate 'Flexible Employment' land uses within the Badgerys Creek Precinct and 'Non-Urban' land uses within the South Creek Precinct. The importance of the South Creek Precinct is detailed in the WSA LUIIP, specifying the South Creek Precinct as critical in achieving objectives as detailed in the GSRP.

Infrastructure

The WSA LUIIP details provisions of infrastructure to be accommodated within the site. Specific to this development are the provisions of transport and open space. The WSA LUIIP seeks to accommodate conservation, open space, infrastructure (wastewater management) and recreation within the South Creek Precinct.

Beyond this, future development on the site is expected to be serviced by significant transport infrastructure, including the proposed North South Rail Link (Stage 1), the M9 Outer Sydney Orbital Corridor and M12 Motorway linking the WSA with the M7 Western Sydney Orbital. The proposed corridor for the M12 traverses through the site with the nearest interchanges proposed at the WSA entry and Mamre Road via Elizabeth Drive.

Future corridors are proposed for a WSA to Parramatta rail link and a freight rail corridor through Western Sydney. It is understood that these corridors are in the early strategic planning phase.

The proposed development consists of site preparation works that will facilitate future development that is largely consistent with that envisaged by the WSA LUIIP and will be supported by various infrastructure as identified in the WSA LUIIP.

Out of Sequence Arrangements

The WSA LUIIP details provisions of 'out of sequence' proposals for development that is inconsistent with WSA LUIIP staging. Out of sequence proposals must demonstrate the following:

- demonstrate compliance with A Metropolis of Three Cities and the Western City District Plan.
- not compromise the integrated land use and transport planning that has focused the initial development areas on the Northern Gateway or Aerotropolis Core.
- be at no cost to government and represent orderly development.
- be fully supported by enabling infrastructure.
- not preclude future urban development identified in this Plan by virtue of:
 - the proposed subdivision of land and subsequent lot size, subdivision pattern or tenure arrangement.
 - the proposed investment in, and the operational and/or economic life of, the proposed development.

With the exception of the land within the South Creek Precinct, the site is not included within an identified "Initial Precinct" under the SWA LUIIP. As demonstrated in the above sections, the proposed development will facilitate future development that is largely consistent with the objectives and planning priorities as detailed in A Metropolis of Three Cities and the Western City District Plan. The proposed earthworks and filling is permissible with consent via the ISEPP as outlined previously and can be considered by Penrith Council on its merits.

Future use of land as facilitated by the proposed development is largely consistent with that envisaged by WSA LUIIP, and the UDZ to be specified by the WSA SEPP.

6.0 Environmental Assessment

This section of the report assesses and responds to the environmental impacts of the proposed DA. It addresses the matters for consideration set out in the SEARs (see **Section 1.3**). The Mitigation Measures at **Section 8.0** complement the findings of this section.

This chapter addresses the following matters:

- Stormwater and Flooding;
- Soil and Water;
- Waste Management;
- Traffic and Transport;
- Air Quality and Odour;
- Noise and Vibration;
- Biodiversity;
- Contamination;
- Visual Impact;
- Heritage;
- Hazard and Risk; and
- Social and Economic Impacts.

6.1 Stormwater and Flooding

This application seeks to modify the existing landform of a site which is partially flood affected. Further, the site's eastern boundary is formed by the alignment of South Creek. A Flood Impact Assessment in support of the application has prepared by Cardno and is included in **Appendix G**.

6.1.1 Existing Environment

The site is identified as partially flood affected, as specified in the PLEP 2010 and shown in **Figure 21**. The site was incorporated within the South Creek Flood Study, prepared for Penrith City Council by WorleyParsons in 2015. The existing environment has been assessed utilising Light Detection and Ranging (LiDAR) (WorleyParsons, 2015) and detailed site surveys (Cardno, 2018).

Due to the location of South Creek at the eastern extent of the site, the area is subject to flooding under a range of Annual Recurrence Interval (ARI) and Probable Maximum Flood (PMF) events, including 20 year and 100 year ARI rainfall events.

The mapped 100 year and PMF flood extents are situated in the eastern part of the site, as shown in Figure 22.

In addressing potential flooding impacts, the proposed works will be undertaken in two stages, as illustrated in **Figure 22**. These are:

- Stage 1A: Importation, placement and compaction of VENM/ENM and ancillary cut/fill earthworks above the PMF extent. The total importation requirement for this stage is approximately 218,090m³; and
- Stage 1B: Importation, placement and compaction of VENM/ENM generally between the Stage 1A extent and the 100-year flood extent. The total importation requirement for this stage is approximately 430,934m³.





Source: PLEP 2010



Figure 22 Division of Stage 1A and Stage 1B sites as illustrated by the red line Source: AT&L

6.1.2 Potential Impacts

An assessment of the potential impacts relating to the proposed stages of filling is provided below. The proposed works have been designed to limit exposure to flooding risk associated with the portions of site west of the 100-year ARI and PMF levels.

Stage 1A

As the Stage 1A works are wholly contained outside of the PMF level, works within this area will have a negligible flooding risk and nil impact on the existing flood extents associated with South Creek.

Stage 1B

Stage 1B represents the filling works proposed within the flood affected area. Accordingly, works within this area are likely to be affected by 100-year ARI and PMF rainfall events. The extent of risk associated with the 100 year ARI and PMF levels are illustrated in **Figure 23** and **Figure 27**.

The proposed works will result in localised minor adverse increases of the flood level within the southern corner of the Stage 1B area, associated within the filling of the area which deflects flow back towards South Creek.

Further, the proposed works will result in localised minor increases of flood velocities adjacent the eastern boundary of Stage 1B, however the 100-year flood extent generally remains consistent with predeveloped extents. The extent of change for the 100-year ARI and PMF is illustrated in the figures below.



Figure 23 Flood hazard under a 100-year ARI event
Source: Cardno



 Figure 24
 Flood extent and levels under a 100 year ARI event

 Source: Cardno



 Figure 25
 Flood depths under a 100 year ARI event

 Source: Cardno



Figure 26 Flood level differences under a 100 year ARI event
Source: Cardno



 Figure 27
 Flood hazard under a PMF event

 Source: Cardno



Figure 28 Flood depths under a PMF event
Source: Cardno



Figure 29 Flood extent and levels under a PMF event
Source: Cardno



Figure 30 Flood level differences under a PMF event
Source: Cardno

6.1.3 Mitigation Measures

Notwithstanding the potential flooding impacts associated with development in the Stage 1B area, it is noted that the proposed works as sought under this application relate to earthworks, with no habitable development or high-risk uses are proposed. Mitigation in respect of flooding impacts within the Stage 1B area will therefore be addressed in future applications that incorporate built form and associated uses. Provisions of erosion and sediment control are discussed in **Section 6.2**.

6.2 Soil and Water

The proposed development is supported by the following documents;

- Geotechnical Investigation;
- Soil Salinity Investigation;
- Interim Geotechnical Design Advice; and
- Bulk Earthworks Specification.

The reports have been prepared by Pells Sullivan Meynink and are included in **Appendix P**. The investigation is informed by desktop analysis and field work testing.

A Dam Dewatering Management Plan prepared by SLR is provided at **Appendix E** and outlines the process to be undertaken for dewatering the existing four dams on the site.

6.2.1 Existing Environment

The investigation describes fill that partly occurred on the site prior to 2011, and cites the relevant studies undertaken in respect of these works. Accordingly, the assessment confirmed the ground was stripped of top soil and unsuitable material prior to the placement of fill, with 1440 density tests were completed in respect of the works and that the fill was compacted to a medium density ratio.

The study involved the investigation of 13 test pits and 8 boreholes across the Stage 1 site, to depths of 1.5m-3m for test pits and 1.4m-10.2m for boreholes. The location of test pits and boreholes is shown in **Figure 31**.



Figure 31 Location of test pits and boreholes

Source: Pells Sullivan Meynink

The investigation found the following subsurface conditions within the test locations.

	Summary of Subsurface conditions		
Inferred Unit	Inferred Top of Unit Depth Below Ground Surface (m)	Description	
Topsoil	0.0	TOPSOIL; Clayey SAND to Sandy CLAY; low to medium plasticity, brown, trace silt, fine to medium grained sand, dry, soft to firm consistency.	

Table 7 Summary of subsurface conditions

Inferred Unit	Inferred Top of Unit Depth Below Ground Surface (m)	Description
		Rootlets, grass and organics observed throughout.
Fill	0.0	Sandy CLAY to Gravelly CLAY; low to medium plasticity, brown, fine to medium grained sand, angular shale gravel, dry, stiff consistency.
		Ripped shale fill; dark grey, highly weathered to slightly weathered, very low to medium strength, angular gravel and cobble with fine sand and clay.
Natural Soil	0.1 to 5.5	Clayey SAND to CLAY; low to high plasticity, orange, pale grey and brown to red-brown, fine to medium grained sand, sub-angular ironstone gravel, dry to moist, firm to hard consistency.
		Gravelly CLAY; medium plasticity, red brown grey, sub angular ironstone gravel, dry to moist, stiff to very stiff consistency.
Bedrock	1.0 to 8.5	SHALE; pale grey and orange, extremely weathered, extremely low strength.
		SANDSTONE; pale grey, extremely to highly weathered, very low strength, fine to medium grained.

Source: Pells Sullivan Meynink

Fieldwork include an investigation of soil salinity, incorporating testing of 15 soil samples as collected throughout the site. No indicators of salinity were observed during the fieldwork study. This is attributed to the existing ground cover which was present across the site. No groundwater was identified in test locations. The investigation found the following:

- pH of the soil samples analysed was in the range of 4.9 to 8.9, with an average of 6.7.
- The 1:5 soil to water extraction and subsequent electrical conductivity (EC1:5) of the soil samples analysed to be in the range of 39 µS/cm to 666 µS/cm
- · Concentrations of chlorides in samples analysed was in the range of less than 10 mg/kg to 1550 mg/kg
- · Concentrations of soluble sulfate in samples analysed was in the range of less than 10 mg/kg to 720 mg/kg
- Cation Exchange Capacity (CEC) in samples analysed was in the range 4.3 meq/100g to 20.6 meq/100g
- Exchange Sodium Percentage (ESP) in samples analysed was in the range of 4.8 % to 27.4 %.

These findings result in the the soils on site being classified as "non-saline to moderately saline".

Existing Dams

There are four existing dams on the site, identified as Dams A, B, C and D. The four dams were investigated on 28 February 2019 with multiple samples undertaken. The water quality within Dam A and B is generally worse than that of Dam C and D with concentration of metals being the differentiating factors.

All four dams were found to be generally brown in colour with vegetation present on the banks.

6.2.2 Potential Impacts

The assessment finds that excavation in the topsoil, fill, natural soils and bedrock is expected to be achievable with conventional earth moving equipment and minor rock breaking. Further, the investigation finds that proposed development is unlikely to encounter groundwater. Notwithstanding this, the investigation details provisions for earth stabilising works including the construction of batter and retaining walls.

The investigation includes interim geotechnical design advice in respect of the proposed bulk earthworks.

Dewatering of Dams

The sampling undertaken of the four Dams A, B, C and D indicates the water quality within Dams A and B was generally worse than Dams C and D, with concentration of metals being the primary difference. Total nitrogen levels in all dams would require treatment to meet the water quality requirements for the site as outlined in **Appendix E**. Based on these outcomes, the water quality in the dams is unsuitable for direct discharge to South Creek.

It is therefore proposed to dewater the dams by irrigation across the broader site, using an area of between $14,000 - 20,000m^2$. This area should be almost saturated each morning to allow for evapotranspiration to occur throughout the day to reduce soil moisture.

Irrigation rates should be approximately 5L/s over the irrigation area (**Figure 32**). Dams A and B would have one area of 14,000m² and Dams C and D a separate 14,000m² area for irrigation. It is anticipated that Dams A and B will take approximately 1 week to dewater and Dams C and D will take up to three weeks, assuming no rainfall.



Figure 32 Indicative irrigation concept

Source: SLR

Erosion and Sediment Control

The Civil Report prepared by AT&L and included at **Appendix D**, and the Engineering Drawings at **Appendix C** outline the proposed erosion and sediment control measures to be installed during the proposed works. The following provides an assessment and the mitigation measures as outlined in the Civil Report.

Due to the existing site conditions and the proposed works on site, the proposed works have the potential for stormwater runoff to erode the proposed earthworks, and impact water quality downstream in South Creek, located to the east of the site.

To counteract erosion impacts associated with the proposed vegetation removal and stripping of remaining topsoils over the site AT&L recommend that the following measures be undertaken as outlined in **Appendix D**:

- utilisation of a paved temporary construction entry/exit point off the access road to the west will be used during construction to prevent the most heavily travelled routes from becoming a source of sediment and dust;
- temporary drains and diversion banks will be designed to maintain non-erosive velocities and direct runoff to temporary sediment trapping structures or divert clean runoff to stabilised outlets;
- filters will be located at all downstream locations of disturbed areas;
- runoff from disturbed areas will be diverted to temporary sediment basins located at strategic locations across the site;
- · progressive re-vegetation during construction staging will stabilise disturbed areas; and
- stockpiling of material with diversion banks upstream of stockpiles to prevent the stockpiled material being washed away.

The Civil Report at **Appendix D** further outlines that the preparation of a comprehensive Erosion and Sedimentation Control Plan for the site prior to the issue of a construction certificate. This plan will take into account soil characteristics and provides for the implementation of the following measures to mitigate the potential impacts on downstream environments from the potential erosion of soil:

- installation of temporary sediment and erosion control measures prior to commencement of construction operations including:
 - installation of sediment filters to filter coarse sediment, litter and debris;
 - provision of barrier fences
- implementation of land disturbance protection measures including:
 - stockpiling of top soil;
 - minimisation of disturbed areas. Only those areas directly required for construction will be disturbed.
 Construction boundaries will be marked and no activity will be permitted outside these designated areas.
 Disturbed areas will be rehabilitated as soon as is practicable through hydroseeding;
- provision of a stabilised entry/exit point onto the access road;
- · retention of water in the detention basins to collect sediment;
- staging of construction activities to ensure that the works program takes account of all measures necessary to control erosion on the site and diversion of clean water from undisturbed areas around working areas; and
- maintenance of sediment control structures, particularly after rainfall to ensure their efficiency until their catchment areas are fully stabilised.

The proposed development will be carried in accordance with the abovementioned mitigation measures.

Specifically, the work will be carried out in accordance the erosion and sediment control measures outlined in the stormwater management strategy of **Appendix C**.

6.2.3 Mitigation Measures

A range of mitigation measures are proposed to minimise the impacts from the proposed earthworks.

Table 8 Summary of mitigation measures relating to geotechnical condition and soil salinity

Impact	Environmental Safeguard	Responsibility	Timing
Design of civil earthworks	Minimise cut and fill activities and depths where practical to do so;	Consultant Civil Engineer	Design Phase

Impact	Environmental Safeguard	Responsibility	Timing
Drainage	Ensure the cut surface can readily drain and will not pond water and that retaining walls do not impede subsurface flow;	Contractor	Construction
Disposal of cut subsoil	Consider where cut subsoil will be disposed to, cut saline soil should not be placed on less saline portions of the site;	Contractor	Construction
Future built form	Consider soil management and exposure of subsoils when designing footings, roads and service trenches; and	Contractor	Construction
Future materiality	Consider the suitability of construction materials for the environment and design specifications to meet the expected level of exposure.	Contractor	Construction
Verification of works	The Geotechnical Inspection and Testing Authority (GITA) shall be contracted to document and certify works undertaken by the contractor has been completed in accordance with the relevant design and specification	GITA, Consultant Civil Engineer and Contractor	Design and construction

6.3 Waste Management

This application seeks consent for the importation, placement and compaction of waste material (VENM/ENM) from other sources including large State Significant and Sydney based infrastructure and building projects, to compact and store on the site to create suitable levels for future employment land.

Waste management legislation for NSW identifies waste generation and management, materials reuse and recycling, transport and disposal and outlines a hierarchy for waste minimisation. The hierarchy advocates:

- Avoidance, in preference to
- · Recovery, including reuse, recycling, reprocessing and energy recovery, in preference to
- Responsible disposal.

Where disposal remains the only option, the Waste Classification Guidelines 2009 provide for classifying six types of waste: special, liquid, hazardous, restricted solid waste, general solid (putrescible) and general solid (non-putrescible). The classifications determine how the materials are to be stored, transported, management and disposed of.

Further explanation of the waste management hierarchy and the applicable waste management legislation is provided in the Waste Management Plan prepared by SLR Consulting at **Appendix H**.

The demolition of existing structures on the site, and the preparation activities are expected to generate the following waste streams:

- Site clearance and excavation wastes;
- Demolition wastes;
- Construction waste;
- Packaging waste;
- Dam sediments; and
- Work compound from on-site employees.

Potential waste types with their classification are provided in Table 9.

Waste Types	NSW Classification	Proposed management method			
Site preparatory works					
Green waste	General solid waste (non-putrescible) (garden waste)	Off-site recycling			
Clean fill	To be classified subject to test results	Beneficial re-use on site			
Contaminated fill	To be classified subject to test results	Off-site treatment or disposal to landfill			
ENM or VENM	To be classified subject to test results	Beneficial re-use on site			
Construction					
Sediment fencing, geotextile materials	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill			
Concrete	General solid waste (non-putrescible)	Off-site recycling for filling, levelling or road base			
Bricks and pavers	General solid waste (non-putrescible)	Off-site recycling: cleaned for reuse, rendered over or crushed for landscaping or driveway use			
Gyprock or plasterboard	General solid waste (non-putrescible)	Off-site recycling or return to supplier			
Sand or soil	General solid waste (non-putrescible)	Off-site recycling			
Metals such as fittings, appliances and electrical cabling	General solid waste (non-putrescible)	Off-site recycling			
Timber	General solid waste (non-putrescible)	Off-site recycling: Treated: reused for formwork, bridging, blocking, propping or second hand supplier; Untreated: reused for floorboards, fencing, furniture, mulched second hand supplier			
Asbestos	Hazardous waste	Removal and off-site disposal by specialist contractors			
Paint	Hazardous waste	Off-site recycling, paint back collection or disposal			
Plant maintenance					
Empty oil or other drums or containers such as fuel, chemical, paints, spill clean ups	Hazardous wastes: containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid wastes (non-putrescible): containers have been cleaned by washing or vacuuming	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility Note: Discharge to sewer subject to Trade Waste Agreement with local Council			
Air filters and rags	General solid waste (non-putrescible)	Off-site disposal			
Oil filters	Hazardous wastes	Off-site recycling			
Batteries	Hazardous wastes	Off-site recycling: Australian Battery Recycling Initiative			
Packaging					
Packaging materials including wood, plastic (stretch wrap etc), cardboard and metals	General solid waste (non-putrescible)	Off-site recycling			
Wooden or plastic creates and pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers or off-site recycling			
Work compound and associated offices					
Food waste	General solid waste (non-putrescible)	Disposal to landfill with general garbage			

Table 9	Potential construction waste generation classifications
Table 3	Potential construction waste generation classifications

Waste Types	NSW Classification	Proposed management method
Recyclable beverage containers such as glass bottles, plastic bottles, aluminium cans and steel cans	General solid waste (non-putrescible)	Co-mingled recycling at off-site licensed facility or at local Return and Earn
Clean paper and cardboard	General solid waste (non-putrescible)	Paper and cardboard recycling at off-site licensed facility
General domestic waste	General solid waste (non-putrescible) mixed with putrescible waste	Disposal at landfill

Source: SLR

The site is anticipated to generate a total of between 500 and 1,000 tonnes of demolition waste.

During importation of fill (to obtain the required levels) any topsoil that is stripped will be stockpiled for use as batter stabilisation. Care is to be taken to minimise site disturbance and limit unnecessary excavation.

Further details of specific waste management activities including segregation, storage and servicing, contaminated or hazardous waste management, and roles and responsibilities is provided in the Waste Management Plan at **Appendix H**.

6.3.1 Mitigation Measures

A range of mitigation measures are provided below to manage waste during the works.

Impact	Environmental Safeguard	Responsibility	Timing
Waste generation during construction	Classify, handle and store all removed waste in the construction compounds/laydown areas in accordance with the NSW Waste Classification Guidelines 2009: Part 1 Classifying Waste (DECCW) and Storing and Handling liquids, Environmental Protection (DECC, 2007).	Construction contractor	Construction
Waste and resource management during construction across the proposal	Prepare a waste and resource management plan (WRMP) as a sub-plan of the CEMP. As a minimum describe the measures for handling, storing and classifying waste when "onsite" and its subsequent disposal offsite to the relevant licenced facility.	Construction contractor	Construction
Waste disposal during construction across the proposal	Send all disposed materials to a suitably licenced waste management/landfill facility.	Construction contractor	Construction
Waste handling and storage during construction across the proposal	Store and segregate all waste at source (e.g. the construction compounds/laydown areas) in accordance with its classification. This includes recycled and reusable materials.	Construction contractor	Construction
Littering and site tidiness during construction and operation	Monitor for waste accumulation, littering and general tidiness to ensure operating standards of the zoo are maintained.	Construction contractor	Construction
Resource recovery during construction across the proposal	 Apply resource recovery principles: Reuse proposal-generated waste materials onsite (e.g. topsoil, recycled aggregate) providing it meets with exemption and classification requirements 	Construction contractor	Construction
	 Failing that, transfer the materials for use elsewhere on another site under a resource recovery exemption 		
	• Employ waste segregation to allow paper, plastic, glass, metal and other material recycling. These materials could be either reused onsite or transferred to a recycling facility		

Table 10 Summary of mitigation measures relating to waste management

Impact	Environmental Safeguard	Responsibility	Timing
	 Consider composting general putrescible waste to allow recovery. Transfer these materials offsite to a composting facility. 		
Reducing primary resource demand during construction across the proposal	Use recycled and low embodied energy products to reduce primary resource demand in instances where the materials are cost and performance competitive (e.g. where quality control specifications allow).	Construction contractor	Construction
General waste management	Implement the Waste Management Plan measures as part of the CEMP	Construction contractor	Construction

6.4 Traffic and Transport

A Construction Traffic Management Plan in support of the proposed development has been prepared by Ason Group and included in **Appendix K**.

6.4.1 Existing Environment

The site is accessed by Elizabeth Drive, aligning with the site's southern boundary with direct site access provided by an unnamed public road located along the western boundary of the site. These roads are described as:

- Elizabeth Drive: a Classified Road (State Road). Dual carriageway road of a predominantly single traffic lane in each direction. Elizabeth Drive widens at various points to accommodate right-turn slip lanes and median strips. Elizabeth Drive runs in an east-west direction, connecting to The Northern Road at its western extent with the Hume Highway at its extent. Elizabeth Drive is approximately 25km in length. The Elizabeth Drive road reserve is approximately 40m at the site. The road is 60km/ph in each direction, increasing to 80km/ph at sections. Elizabeth Drive is a clearway road.
- Unnamed public road: The unnamed public road is a local road, a dual carriageway road of a single lane in each direction. The road connects the SUEZ Waste Recovery facility to Elizabeth Drive. The accessway is approximately 500m in length and runs in a north-south direction. The road reserve is approximately 20m in width. The road does not feature provisions for turning lanes, median strips or parking lanes. The accessway does not have a signposted speed limit, therefore it is assumed the speed limit is 50km/ph.

In addition, there are a number of other roads located near to the site which provide access into broader Sydney:

- Westlink M7 Motorway: a high capacity state significant road, providing a key north-south link between the M2 Motorway in the north and the M5 Motorway to the south. The M7 has a posted speed limit of 100km/h with four lanes (two lanes each way);
- M12 Motorway (future): a proposed 16km motorway running east-west between The Northern Road and M7 Motorway;
- Wallgrove Road: an arterial road running in a north-south direction parallel to the M7 Motorway. It connects to the M4 Motorway approximately 2.5km to the north of the site:
- The Northern Road: a three lane (one to two lanes each direction) with a speed limit of 80km/h, it provides a
 regional north-south link located to the west of the site:
- Western Road: a local road running in a north-south direction from Elizabeth Drive, with two lanes of traffic for two way movement and a speed limit of 80km/h: and
- Mamre Road: an arterial road servicing traffic between the Great Western Highway and M4 Motorway to the north and Elizabeth Drive to the south. It generally provides two lanes for two-way traffic, with a posted speed limit of 80km/h.

Given the site's existing use as agricultural lands, traffic generation associated with its current use is minimal, anticipated to be generated by the site owners/occupiers and a low volume of employees. The site does not include a use that would attract visitors to the site.

6.4.2 Potential Impacts

Vehicle movements to and from the site during the works are likely to include light vehicles from workers and construction staff movements, and delivery of fill vehicles such as truck and dog style vehicles.

Light vehicles are generally anticipated to arrive and exit the site outside of peak travel periods due to the nature of the works, with the majority of trips expected to be between 6.30am and 7.00am, and 6.00pm and 6.30pm.

The proposed works are estimated to generate demand for up to 300 heavy vehicles per day (1,200 vehicle movements in and out). This equates to approximately 120 heavy vehicle movements per hour. It is expected there will be a 60/40% split for arrivals and departures in the AM peak, and a 40/60% split for arrivals and departures in the PM peak.

To ascertain the impacts on the local road network, SIDRA modelling was undertaken to establish the existing performance of key intersections within the vicinity of the site. SIDRA modelling provides a range of performance measures as outputs:

- degree of saturation (DOS): where a value of 1.0 represents an intersection at theoretical capacity;
- average vehicle delay (AVD): the average delay per vehicle in seconds which is also used to determine an intersections level of service; and
- level of service (LOS): a comparative measure that provides an indication of the operation performance of an intersection.

Level of Service	Average delay per vehicle (secs/veh)	Traffic signals, roundabout	Give way and stop signs
А	Less than 14	Good operation	Good operation
В	15 – 28	Good with acceptable delays and space capacity	Acceptable delays and space capacity
С	29 – 42	satisfactory	Satisfactory, but accident study required
D	43 – 56	Operating near capacity	Near capacity and accident study required
E	57 – 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

 Table 11 below provides a summary of RMS LOS criteria for intersections.

LOS criteria for intersections

Source: Ason Group

Table 11

Based on the SIDRA modelling completed, key existing intersections near to the site have been modelled and found to be generally operating at a LOS of between B and D (**Table 12**). These intersections include:

- Wallgrove Road and Elizabeth Drive, approximately 7.5km to the east of the site access;
- Mamre Road and Elizabeth Drive, approximately 4.35km east of the site access; and
- Western Road and Elizabeth Drive, approximately 1.6km east of the site access.

Intersection	Control type	Period	Intersection delay	Level of Service
Wallgrove Road and Elizabeth Drive	Signals	AM	41.1	С
		PM	44.8	D
Mamre Road and Elizabeth Drive	Roundabout	AM	15.2	В
		PM	16.1	В
Western Road and Elizabeth Drive	Priority	AM	10.4	В
		PM	17.5	С

Table 12 Existing intersection performance

Source: Ason Group

To model the future operation of the intersections based on traffic movements associated with the proposed works, heavy vehicles generated by the site have been assigned to the primary construction route. Given there is minimal background growth in traffic movements in the area (with the only known traffic generator at this time being early works for the Western Sydney Airport), it is anticipated that less than 10 vehicles per hour would be generated through these key intersections. These trips have however been assigned to the assessment (arrival and departure).

Table 13 Future intersection performance

Intersection	Control type	Period	Intersection delay	Level of Service
Wallgrove Road and Elizabeth Drive	Signals	AM	40.2	С
		PM	45.0	D
Mamre Road and Elizabeth Drive	Roundabout	AM	18.7	В
		PM	24.7	В
Western Road and Elizabeth Drive	Priority	AM	11.7	В
		PM	20.2	С

Source: Ason Group

As seen by the SIDRA modelling completed at key intersections near to the site, the proposed earthworks construction traffic will have a negligible impact on traffic volumes, with all intersections remaining at their current LOS rating.

6.4.3 Mitigation Measures

In order to manage traffic impacts associated with the proposed filling works, a range of mitigation measures are proposed.

Table 14 Summary of mitigation measures relat	ting to traffic and transport
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Impact	Environmental Safeguard	Responsibility	Timing
Traffic Impacts associated with construction phases	Consistent with RMS Guide 'Traffic Control at Worksites', a Vehicle Movement Plan (VMP) will be established. The VMP will detail: • Illustration of preferred travel paths for entry to and exit	Construction Contractor	Pre-construction / Construction
	 Illustration of vehicle movement within the site, showing general manoeuvrability, accesses and sideroads; Applicable speed limits within the site; 		
	 Applicable speed limits within the site, Safety relating to site entry (visibility and speed from the Elizabeth Drive intersection) 		
	Traffic signals and signage;Designation of an on-site traffic controller;		
	Designation of a loading supervisor; andPedestrian safety strategy		

Impact	Environmental Safeguard	Responsibility	Timing
Traffic Impacts associated with site management (communication)	A Development of a program to monitor the effectiveness of the Construction Traffic Management Plan is to be established. This process involves communication between the Project Manager and Construction Contractor.	Project Manager/ Construction Contractor	Pre-construction / Construction
	 Considerations of the program include: Tracking heavy vehicle movements against the estimated heavy vehicle flows during the 1 works. 		
	 The identification of any shortfalls in the CTMP, and the development of revised strategies / action plans to address such issues. 		
	• Ensuring that all TCPs are updated (if necessary) by "Prepare a Work Zone Traffic Management Plan" card holders to ensure they remain consistent with the set-up on-site.		
	• Regular checks to ensure all loads are departing the Site covered as outlined within this CTMP.		
	 A Communication Strategy will be established by the Project Manager to ensure appropriate to the community and to assist the Construction Contractor in achieving minimal impacts on the surrounding road network. This will involve: The erection of appropriate signage providing advanced notice of works and any traffic control measures to be implemented. 	Project Manager	Pre-construction / Construction
	 Written notices to surrounding landowners (and tenants) likely to be directly affected by the works, prior to commencement. 		
Impacts on stakeholder potentially effected by	The Project Manager will ensure the appropriate stakeholders are considered in respect of traffic	Project Manager	Pre-construction / Construction
traffic impacts.	management:		
	Government Agencies		
	- Roads and Maritime Services (RMS)		
	 Transport Management Centre (TMC) Department of Planning and Environment (DDE) 		
	 Department of Planning and Environment (DPE) Transport for NSW (TfNSW) 		
	 Sydney Coordination Office (SCO) 		
	Local Government		
	- Penrith City Council		
	Emergency Service		
	- Police		
	- Fire and Rescue		
	- Ambulance		
	Local Schools		
	 Christadelphian Heritage College 		
	 Kemps Creek Public School 		
	- Irfan College		
	Surrounding Landowners		
	- SUEZ KEMPS CREEK		
	- Aminiai Wellare League NSW		
	- 10B Martin Road		
a			

6.5 Air Quality and Odour

A Construction Air Quality Management Plan has been prepared by SLR (Appendix N) and is summarised below

6.5.1 Air Quality Criteria

The air quality criteria is determined by the National Environment Protection Measures (NEPM) for dust and particulate matter covering PM_{10} and $PM_{2.5}$ annual averages and 24 hour periods. This is supported by the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW by the EPA, which also includes total suspended particles (TSP) and deposited dust criteria, while also being consistent with the NEPM criteria for particulate matter.

Pollutant	Averaging Period	Assessment Criteria (μg/m³)
PM ₁₀	24 hours	50
	Annual	25
PM _{2.5}	24 hours	25
	Annual	8
TSP	Annual	90
Deposited dust	Annual	2 (maximum increase in deposited dust level)4 (maximum total deposited dust level)

Table 15 Applicable air quality criteria

Source: SLR

6.5.2 Existing Environment

Sydney's temperate subtropical climate is generally characterised by very warm summers and mild, warm winters. Meteorological data for the area surrounding the site is recorded at the nearby Badgerys Creek Automatic Weather Station (AWS), operated by the Bureau of Meteorology (BOM), approximately 4.5km south of the site. Temperate data recorded at that site indicates that January is the hottest month with a mean daily maximum temperature of 30.3°C, with July being the coolest month with a mean daily minimum temperature of 4.1°C. On average, there are 22 rain days per year delivering 671mm of rain, with February being the wettest month.

The nearest sensitive receivers to the site are residential properties located approximately 80m to the south across Elizabeth Drive.

Dust and particulate matter

The nearest location where long-term air quality is monitored is the OEH air quality monitoring site at the Bringelly Air Quality Monitoring Station (AQMS), located approximately 5km south of the site. The station monitorsPM₁₀ and PM_{2.5}, noting the latter only commenced monitoring in July 2016. A summary is provided in **Table 16** below.

Pollutant	PM10		PM _{2.5}	
Averaging Period	Maximum 24-hour	Annual	Maximum 24-hour	Annual
Units	µg/m³	µg/m³	µg/m³	µg/m³
2014	42.6	16.6	ND	ND
2015	57.0	15.8	ND	ND
2016	61.6	16.9	21.6	7.6
2017	83.7	19.8	52.5	7.5
2018	92.9	21.2	55.6	8.0
Criterion	50	25	25	8

Table 16 Bringelly AQMS particulate monitoring data

Source: SLR

As noted above there are a number of exceedances of the short-term criteria (24 hour average) for PM_{10} in 2015 through 2018 and for $PM_{2.5}$ in 207 and 2018. Most of these were caused by regional events such as bushfire emergencies or dust storms.

This indicates that during the bulk earthworks for the development there is the potential for increases of particulate matter in the air to occur.

6.5.3 Potential Impacts

Dust emissions will be generated during construction of the project, mainly through the bulk earthworks phase. Potential dust emission sources during construction works include:

- · Wind-generated dust from disturbed surfaces and stockpiles; and
- Wheel-generated dust and particulate matter emissions in diesel exhaust emissions from on-site plant and equipment and construction traffic movements.

In addition to these, environmental factors can influence the generation and dispersion of dust including:

- Wind direction;
- Wind speed;
- Surface type;
- · Surface material moisture; and
- Rainfall or dew.

The term "particulate matter" refers to a category of airborne particles, typically less than 30 microns (μ m) in diameter down to 0.1 μ m and is termed total suspended particulate (TSP). Emissions of particulate matter less than 10 and 2.5 microns (μ m) in diameter (referred to as PM₁₀ and PM_{2.5} respectively) can enter the respiratory system and cause health impacts, particularly PM_{2.5}. Deposited dust can also settle on the environment including houses and vehicles, causing nuisance. To calculate this, categorisation of dust emission magnitude has been established per **Table 17**.

Activity	Dust Emission Magnitude	Basis
Demolition	Small	Total building volume <20,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months. Only one (1) building is to be demolished, assuming an area of 800 m ² (40 m x 20 m) and height of 10 m, equates to a total volume of ~8,000 m ³ .
Earthworks	Large	Total site area greater than 10,000 m ² , potentially dusty soil type (eg clay, which will be prone to suspension when dry due to small particle size), more than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 8 m in height, total material moved more than 100,000 t. Total area where the earthworks will be undertaken at the Development Site is estimated to be approximately 550,000 m ² .
Trackout	Large	More than 50 heavy vehicle movements per day, surface materials with a high potential for dust generation, greater than 100 m of unpaved road length.

Table 17 Categorisation of emission	magnitude
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Source: SLR

To assess the impacts on the nearby sensitive receivers, they have been allocated a sensitivity of high for health impacts and high for dust soiling. The general area itself has been given a sensitivity rating of low for dust soiling and low for health effects, due to its rural setting. As seen below in **Table 18** this provides a low risk rating of adverse impacts in terms of dust soiling and human health effects at the off-site sensitive receiver locations, if no mitigation measures were implemented.

Impact	Sensitivity of Area	Dust Emission Magnitude		Preliminary Risk			
		Demolition	Earthworks	Trackout	Demolition	Earthworks	Trackout
Dust Soiling	Low	Small	Large	Large	Negligible Risk	Low Risk	Low Risk
Human Health	Low				Negligible Risk	Low Risk	Low Risk

Table 18 Preliminary risk of air quality impacts

Source: SLR

Implementation of the mitigation measures below in **Section 6.5.4** provides a positive change in the risk assessment completed and results in a negligible impact for air quality from the proposed works (**Table 19**).

Table 19 Air quality impacts including mitigation

Impact	Sensitivity of Area	Residual Risk			
		Demolition	Earthworks	Trackout	
Dust Soiling	Low	Negligible Risk	Negligible Risk	Negligible Risk	
Human Health	Low	Negligible Risk	Negligible Risk	Negligible Risk	

Source: SLR

6.5.4 Mitigation Measures

Table 20 below identifies the proposed mitigation measures for air quality.

Table 20	Summary of mitigation measures relating to air quality
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Impact	Environmental Safeguard	Responsibility	Timing
Communications	 Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. 	Construction contractor	Construction
	Display the head or regional office contact information.		
	 Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. 		
Site management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Construction contractor	Construction
	 Make the complaints log available to the local authority when asked. 		
	• Record any exceptional incidents that cause dust and/or air emissions, either onsite or offsite, and the action taken to resolve the situation in the log book.		
Monitoring	 Perform daily on-site and off-site inspections at locations (including roads) where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary. 	Construction contractor	Construction
	 Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. 		
	 Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. 		

Impact	Environmental Safeguard	Responsibility	Timing
Site preparation and maintenance	 Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. 	Construction contractor	Construction
	 Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period. 		
	 Keep site fencing, barriers and scaffolding clean using wet methods. 		
	Cover, seed or fence stockpiles to prevent wind erosion		
Air quality emissions through vehicle	Ensure all on-road vehicles comply with relevant vehicle emission standards, where applicable	Construction contractor	Construction
movements	 Ensure all vehicles switch off engines when stationary for periods of more than two minutes - no idling vehicles 		
	 Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable 		
Dust emission management	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate	Construction contractor	Construction
	Use enclosed chutes and conveyors and covered skips		
	 Minimise drop heights from loading shovels and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate 		
Waste management	Avoid bonfires and burning of waste materials.	Construction contractor	Construction
Track out	 Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site. 	Construction contractor	Construction
	Avoid dry sweeping of large areas.		
	• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.		
	 Record all inspections of haul routes and any subsequent action in a site log book. 		
	 Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). 		
Demolition	 Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust) 	Construction contractor	Construction
	• Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.		
	 Avoid explosive blasting, using appropriate manual or mechanical alternatives 		

6.6 Noise and Vibration

A Construction Noise and Vibration Management Plan has been prepared by SLR and is at Appendix O.

6.6.1 Existing Environment

There were a total of 41 sensitive receivers identified near to the site as shown in **Figure 33**. These all represent residential and commercial properties.

Minimum Rating Background Levels (RBLs) were adopted for the project in accordance with the EPA's NSW Noise Policy for Industry 2017 (NPfI):

- Day: 35
- Evening: 30
- Night: 30

These RBLs have been used for the purpose of noise impact modelling completed within the Construction Noise and Vibration Management Plan at **Appendix O**.


(GDA94) MGA Zone 56

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Figure 33 Sensitive noise receiver locations

Source: SLR

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6.6.2 Noise Criteria

The EPA's Interim Construction Noise Guideline (ICNG) outlines noise management levels (NMLs) to reduce the impact of noise arising from construction activities (**Table 21**).

Time of Day	Noise Management Level L _{Aeq(15minute)*}	How to Apply
Recommended standard hours • Monday to Friday • 7am to 6pm • Saturday 8am to 1pm • No work Sundays	Noise Affected RBL** + 10 dBA	 The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	 The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise Affected RBL** + 5 dBA	 A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2 of the ICNG.

Table 21 ICNG Noise Management Levels

Source: ICNG

The ICNG recommends restricting construction hours for noise generating activities above the highly affected noise management level. Based on these, project specific NMLs have been determined for the project (**Table 22**) within standard construction hours. These NMLs have been determined on the basis of the RBLs outlined above.

Table 22	Project specific NMLs			
Receiver		Assumed Ambient Noise Level – RBL LA90	Noise Management Levels – NMLs L _{Aeq(15minute)}	
			Standard Hours Daytime	Highly Noise Affected (Daytime)
Residential		35	45	75
Commercial		N/A	70 (when in use)	5.

Source: SLR

6.6.3 Potential Impacts

The construction noise assessment identifies the worst-case scenario for noise emissions from the site, assuming all proposed plant and equipment operating simultaneously and at the eastern and southern boundaries of the site (nearest to the sensitive receivers).

Construction activities will generally occur during standard construction hours in accordance with the ICNG recommended standard hours:

Noise will be generated through the use of heavy equipment and machinery, including:

- Skidsteer loader
- Backhoe
- Backhoe + hammer
- Dozer 98 kW 145 kW
- Dozer 145 kW 175 kW
- Dozer 220 kW 305 kW
- Dozer 305 kW 400 kW
- Grader
- Loader 90 kW
- Roller

- Scraper
- Excavator <10 t + hammer
- Excavator 12 t + hammer
- Excavator 20 t + hammer
- Excavator 30 t + hammer
- Watercart
- Truck 13 t payload
- Truck and Dog 30 t payload
- Air Compressor (without operator) 41 L/s o Generator 6.8 kVA (without operator)

Assumed Sound Power Levels for each piece of equipment and plant were adopted for the purpose of conducting the assessment.

The assessment indicates that noise levels will exceed the adopted NMLs at all sensitive receivers, namely R3 through R7 which see exceedances greater than 10 dBA, due to their close proximity to the site. **Table 23** below provides a summary of the modelled noise impacts.

Receivers R3 through R7 have specialised mitigation measures proposed which include ongoing monitoring of noise levels and letterbox drops.

Receiver ID	LAeq(15minute) dBA Noise Level	Standard Hours Daytime NML – LAeq(15minute) dBA	Exceedance of NML L _{Aeq(15minute)} dBA
R1	51	45	6
R2	54	45	9
R3	56	45	11
R4	58	45	13
R5	59	45	14
R6	61	45	16
R7	60	45	15
R8	51	45	6
R9	51	45	6
R10	50	45	5
R11	50	45	5
R12	49	45	4
R13	50	45	5
R14	50	45	5

Table 23 Construction noise predictions

Receiver ID	LAeq(15minute) dBA Noise Level	Standard Hours Daytime NML – LAeq(15minute) dBA	Exceedance of NML L _{Aeq(15minute)} dBA
R15	53	45	8
R16	52	45	7
R17	51	45	6
R18	51	45	6
R19	54	45	9
R20	51	45	6
R21	53	45	8
R22	52	45	7
R23	52	45	7
R24	52	45	7
R25	52	45	7
R26	51	45	6
R27	52	45	7
R28	51	45	6
R29	51	45	6
R30	50	45	5
R31	50	45	5
R32	50	45	5
R33	50	45	5
R34	50	45	5
R35	49	45	4
R36	49	45	4
R37	49	45	4
R38	48	45	3
R39	48	45	3
R40	48	45	3
R41	48	45	3

Source: SLR

Construction Vibration

The main vibration generating equipment to be used at the site will include trucks during operation and rollers and dozers during the bulk earthworks phase of the project.

The nearest structure to the site is located approximately 50m from its boundary. Subsequently, it is considered that vibration levels from the proposed works will be below the criteria for 'minimal risk of cosmetic building damage' at the nearest residential neighbour. Refer to the Construction Noise and Vibration Management Plan at **Appendix O** for further detail.

6.6.4 Mitigation Measures

Table 24 below outlines the mitigation measures proposed for the works to manage noise impacts.

Impact	Environmental Safeguard	Responsibility	Timing
Impacts at Receivers R3 through R7	 Operator attended monitoring at the sensitive receiver for (at a minimum) one 15-minute period at the commencement of the construction period and at the commencement of any significant operational event. Letterbox drops to advise of upcoming poisy works. 	Construction contractor	Construction
			handha anna an a
Construction noise management	Implement the Construction Noise and Vibration Management Plan	Construction contractor	Construction
Construction noise impacts	 Working hours are to be restricted in accordance with the EPA Interim Construction Noise Guideline. Working hours are to be in accordance with: Between 7.00am and 6.00pm, Monday to Friday. Between 8.00am and 1.00pm Saturdays. No work or deliveries on Sunday and/or public holidays. If work is required to be undertaken outside normal work hours, the Contractor will need approval from the Principal. The Contractor is to provide enough information for the Principal to evaluate any potential noise impact from the proposed works. 	Construction contractor	Construction
Construction noise impact scheduling	 Scheduling for the higher project specific noise criteria exceedance activities to be undertaken predominantly during less noise-sensitive time periods, where possible. The adjacent noise sensitive receivers should be consulted to assist in identifying their less noise sensitive time periods Any required night time work predicted to exceed the noise management level should aim to not affect residences for more than two consecutive nights or where possible, more than six nights over a one month period. 	Construction contractor	Construction
Construction noise impacts	Briefing of the work team (i.e. tool box talks) in order to create awareness of the locality of sensitive receivers and the importance of minimising noise emissions.	Construction contractor	Construction
Construction noise impacts	Ensuring spoil is placed and not dropped into awaiting trucks.	Construction contractor	Construction
Construction noise impacts	Use of less noise-intensive equipment, where reasonable and feasible.	Construction contractor	Construction
The potential for exceedance of the NMLs across the proposal footprint	Strategically position plant on site to reduce noise levels at the nearest receivers.	Construction contractor	Construction

Table 24	Summary	of mitigation	measures re	elating	to noise
	ounnary	or miligation	measures n	slating	10 110130

6.7 Biodiversity

A Biodiversity Development Assessment Report has been prepared by EcoLogical Australia (**Appendix F**) in accordance with the requirements of the BC Act.

6.7.1 Existing Environment

The site has been largely cleared of native vegetation, however both remnant and regrowth vegetation is present around existing drainage lines and dams. The site contains a first order stream in accordance with the Strahler system however this is not considered a watercourse consistent with the Water Management Act 2000.

Site surveys were completed on 14 and 19 March 2018 to identify the existing environment present on the site. A total of four vegetation plots were collected within the development site consistent with the Biodiversity Assessment Method. Additional field work was completed for targeted surveys for threatened flora, Cumberland Plain Land Snail

and the Green and Golden Bell Frog. Further microchiropteran bat (micro bat) Anabat surveys were conducted in February 2019.

The site survey identified that there are three Plant Community Types (PCTs) located on the site:

- PCT 725 Broad-leaved Ironbark Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion. This PCT conforms to the endangered ecological community (EEC) Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (CRCIF);
- PCT 849 Grey Box Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion. This PCT conforms to the critically endangered ecological community (CEEC) Cumberland Plain Woodland in the Sydney Basin Bioregion (CPW); and
- PCT 1071 Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion.

These three PCTs make up three vegetation zones across the site, noting that PCTs 725 and 849 are considered to be in a degraded state.

PCT 725 covers an area of 0.69ha, PCT 849 covers 1.63ha and PCT 1071 covers 0.85ha. All three are listed as Threatened Ecological Communities under the BC Act.

PCT 835 – Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion is also present within the broader study area (being the entire Lot 5) however is not located within the area proposed to be filled. This PCT conforms to the endangered ecological community (EEC) River Flat Eucalypt Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregion (RFEF).

The vegetation zones were provided with calculated vegetation integrity scores consistent with the Credit Calculator as shown in **Table 25**.

Vegetation Zone	РСТ	Name	Condition	Area (ha)	Vegetation Integrity Score	Description
1	725	Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion	Moderate condition - regrowth	0.69	27.5	Characterised by a native canopy of semi-mature trees with a sparse shrub layer and grassy ground layer.
2	849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Low condition – exotic understorey	1.63	19.4	characterised by a native canopy of a mature eucalypt species, Eucalyptus tereticornis. Ground stratum dominated by exotic herbs and grasses. Regrowth of eucalypt canopy species is present.
3	1071	Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion.	Moderate condition	0.89	35.9	Located around dams and waterlogged drainage lines. It is dominated by Eleocharis sphacelata. Other native species present include Juncus usitatus, Alternanthera denticulata and Persicaria sp.

Table 25	Vegetation	zones
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Source: EcoLogical Australia

Several ecosystem credit species are predicted to occur at the subject site, with four of these being recorded during the Anabat surveys completed:

- Falsistrellus tasmaniensis (Eastern False Pipistrelle);
 - Listed as Vulnerable under the BC Act;
- Miniopterus australis (Little Bentwing-bat (foraging));
 - Listed as Vulnerable under the BC Act;
- Scoteanax rueppellii (Greater Broad-nosed Bat); and
 - Listed as Vulnerable under the BC Act;
- Miniopterus schreibersii oceanensis (Eastern Bentwing-bat).
 - Listed as Vulnerable under the BC Act;

Additional ecosystem credit species predicted to occur on the site based on the type of vegetation present and other habitual matters include:

- Glossopsitta pusilla (Little Lorikeet);
 - Listed as Vulnerable under the BC Act;
- Haliaeetus leucogaster (White-bellied Seaeagle (foraging));
 - Listed as Vulnerable under the BC Act;
- Hieraaetus morphnoides (Little Eagle (foraging));
 - Listed as Vulnerable under the BC Act;
- Lophoictinia isura (Square tailed Kite (Foraging));
 - Listed as Vulnerable under the BC Act;
- Mormopterus norfolkensis (Eastern Freetail-bat);
 - Listed as Vulnerable under the BC Act;
- Nophema pulchella (Turquoise Parrot);
 - Listed as Vulnerable under the BC Act;
- Ninox strenua (Powerful Owl (Foraging));
 - Listed as Vulnerable under the BC Act;
- Pandion cristatus (Eastern Osprey);
 - Listed as Vulnerable under the BC Act;
- Pteropus poliocephalus (Grey-headed Flyingfox (foraging));
 - Listed as Vulnerable under the BC Act and Vulnerable under the EPBC Act;
- · Saccolaimus flaviventris (Yellow-bellied Sheathtail-bat); and
 - Listed as Vulnerable under the BC Act;
- Tyto novaehollandiae (Masked Owl (Foraging)).
 - Listed as Vulnerable under the BC Act.

One species credit species was recorded within the site, being Myotis Macropus (Southern Myotis) with a habitat area of 2.48ha. The Southern Myotis is listed as Vulnerable under the BC Act.

No specimens of Cumberland Plain Land Snail or the Green and Golden Bell Frog were identified on site during the surveys.



Figure 34 Plant Community Types on the site

Source: EcoLogical Australia

6.7.2 Potential Impacts

The proposed bulk earthworks has been located in a manner to avoid and minimise biodiversity impacts particularly all impacts to the riparian zone near South Creek, which contains better condition native vegetation. No works are proposed within the riparian zone. Furthermore, the filling works will have only minor impacts to connectivity of habitat. However, the proposed works do result in impacts to potential foraging habitat for the Grey-headed Flying Fox and other threatened microbats.

Additionally, the assessment notes the connectivity of the area proposed to be cleared to the riparian lands associated with South Creek, located east of the site. In respect of potential impacts to the riparian area associated with South Creek, the assessment finds that potential impacts are largely contained to areas that will experience earthworks, and that the existing connectivity of vegetation throughout the site will be maintained. The assessment finds that the existing connections (of vegetation within the site) are unlikely to be used by fauna except for mobile species who would not be impeded by the development. The development will not sever the connectivity for these mobile species.

Direct impacts from the proposed earthworks result in impacts to a total of 3.17ha of PCTs:

- PCT 725 Broad-leaved Ironbark Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion: 0.69ha direct impact;
- PCT 849 Grey Box Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion: 1.63ha direct impact; and
- PCT 1071 Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion: 0.85ha direct impact.

This represents the removal of the entire area of each of the PCTs within the footprint of the proposed works, resulting in a future vegetation integrity score of zero for each.

The works will also impact on 2.48ha of threatened species habitat of the Southern Myotis.

There are a number of indirect impacts affecting ecological communities on the site such as:

- · Sedimentation and contaminated and/or nutrient rich run-off;
- Noise, dust or light spill;
- · Inadvertent impacts on adjacent habitat or vegetation; and
- Transport of weeds and pathogens from the site to adjacent vegetation.

Further assessment of indirect impacts is provided in the BDAR at Appendix F.

The impacts of the development on the vegetation zones require offsets in the terms of ecosystem credits based on a Biodiversity Credit Report completed as part of the BDAR. These are summarised below in **Table 26**.

Vegetation Zone	РСТ	Name	Condition	Vegetation Formation	Direct Impact (ha)	Credits required
1	725	Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion	Moderate condition - regrowth	Dry Sclerophyll Forests (Shrub/grass sub-formation)	0.69	9
2	849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Low condition – exotic understorey	Grassy Woodland	1.63	20

Table 26 Credits required

Vegetation Zone	PCT	Name	Condition	Vegetation Formation	Direct Impact (ha)	Credits required
3	1071	Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion.	Moderate condition	Freshwater Wetlands	0.89	15

Source: EcoLogical Australia

Additionally, 31 credits are required for the direct impact on 2.84ha of Southern Myotis habitat, consistent with the Biodiversity Assessment Method. At this stage it is intended that a monetary payment will be made for the required credits.



Figure 35 Impacts requiring offsets

Source: EcoLogical Australia

6.7.3 Mitigation Measures

A range of mitigation measures are proposed to reduce the impact on flora and fauna during the proposed works.

Impact	Environmental Safeguard	Responsibility	Timing
Displacement of resident fauna and microbats	 Pre-clearance surveys for microbats in existing hollow trees should be undertaken several weeks prior to construction commencing. If microbats are present within the trees, a Microbat Management Plan should be prepared to minimise impacts to bats during construction. 	Contractor Project ecologist	Construction
	 Additional pre-clearance survey should be undertaken immediately before construction. 		
	Clearing protocols are to be implemented that identify:		
	 vegetation to be retained, 		
	 prevent inadvertent damage and reduce soil disturbance 		
	 ideally specify the removal of native vegetation by chain-saw, rather than heavy machinery, as this is preferable in situations where partial clearing is proposed 		
Sedimentation and contaminated and/or nutrient rich run-off	 Install sediment barriers and erosion control during and post construction to prevent runoff into adjacent creeklines. 	Contractor	Construction
	 Maintain controls throughout earthworks and undertake weekly inspections as detailed in the Erosion and Sediment Control Plan 		
Noise, dust or light spill	 Pre-clearance survey for microbats in loose barked trees and any bird/other nests present. 	Contractor Project ecologist	Construction/Operation
	 Monitor response of bats to works/noise. 		
	 Implement noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise 		
	 Daily timing of construction activities is recommended in accordance with Table 1 of Interim Noise Guidelines (2009): 		
	 Monday to Friday 7.00am to 6.00pm 		
	 Saturday 8.00am to 1.00pm 		
	 No work on Sunday or public holidays 		
	 Night-time works should be avoided within proximity to the riparian corridor to prevent indirect impacts to microbats. 		
Inadvertent impacts on adjacent habitat or	 Pre-clearance survey for microbats in loose barked trees and any bird/other nests present. 	Contractor Project Ecologist	Construction
vegetation	 Monitor response of bats to works/noise. 		
	Implement clearing protocols including:		
	 pre-clearing surveys 		
	 daily surveys and staged clearing 		
	 the presence of a trained ecological or licensed wildlife handler during clearing events 		
Transport of weeds and pathogens from the site to adjacent vegetation	• All staff working on the development will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work. This induction will include items such as:	Contractor	Construction

 Table 27
 Summary of mitigation measures relating to biodiversity

Impact	Environmental Safeguard	Responsibility	Timing
	 Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and noxious weeds) 		
	 2. What to do in case of environmental emergency (chemical spills, fire, injured fauna) 		
	 - 3. Key contacts in case of environmental emergency 		
	 Trucks are to be cleared off at the entry and exit point of the site. 		
Other construction activities: • Vehicle strike	All staff to undertake an environmental induction per above.	Contractor	Construction
Rubbish dumping			
Wood collection			
Disturbance to specialist breeding and foraging habitat	Preparation and implementation of a Vegetation Management Plan (VMP) is recommended to protect and enhance retained vegetation adjacent to the development site (namely the riparian lands associated with South Creek, within the Stage 1 site)	Contractor Project ecologist	Construction/Operation

6.8 Contamination

A Preliminary Environmental Site Investigation (Phase 1) has been prepared by JBS&G and is included at **Appendix L**. The purpose of the assessment is to assess potential contamination from historical activities across the site. The investigation was informed by desktop analysis and field studies.

An Unexpected Finds Protocol has been prepared (Appendix L) in the case of unexpected contaminants on-site.

6.8.1 Initial Investigations

A site visit conducted across the site extent indicates the area comprises largely open paddocks covered by grasses. A large storage shed, shipping containers, scrap metal, plastics and other wastes including truck and car batteries were stored in areas surrounding the shed. Fragments of asbestos containing materials were identified within areas of existing fill material and stockpiles.

The site has previously been used for light agricultural purposes, specifically along its northern boundary and the central and southern portions of the site.

The investigation finds that onsite contaminants are likely from surface deposits that are associated with the site's former use as a farm. These include pesticides/herbicides as used in former market garden areas, biological contamination from livestock, discarded hazardous building materials (asbestos) and potential hydrocarbon, PAH, OCP contamination from the storage of materials, plant and consumables. Potential contaminants are identified in **Table 28**.

Potential Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Onsite	
Historical and existing site structures	Heavy metals, lead and asbestos
Storage and maintenance of equipment and consumables	Heavy metals, PAHs, TRH/BTEX and VOCs
Fill materials	Heavy metals, PAHs, TRH/BTEX, OCPs/PCBs and asbestos
Horse/livestock stables	Biological hazards
Historical market garden areas	Pesticides (OCPs/OPPs)

Table 28 Potential contaminants on site

Potential Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Aesthetic impacts	Rubbish and fly tipped wastes
Offsite	
Migration of ground gases from adjacent landfill	Methan, carbon dioxide, hydrogen sulphide
Migration of contaminated groundwater	Heavy metals, PAH, TRH/BTEX, OCPs/PCBs

Source: JBS&G

The SUEZ Recycling and Recovery Centre to the west of the site is subject to a licence issued under the POEO Act, for waste storage and disposal. The investigation notes potential contaminants that may have migrated from the neighbouring resources recovery centre, including potentially impacted groundwater and landfill gas. Further, the site's proximity to an airstrip (located north-east of the site) may be a potential source of PFAS contamination, associated with the uses of fire-fighting chemicals at the airfield however this is located approximately 750m to the north-east of the site and located downstream of South Creek.

Soil Sampling

As part of the assessment 21 test pits were investigated on the Stage 1 site (as illustrated in **Figure 36**), with one borehole located along its western boundary. Testing of boreholes throughout the Stage 1 site discovered anthropogenic materials within seven of the test pits. Further, fragments of fragments of ACM were identified within stockpiled materials at TP09 and TP10, and in underlying fill material at TP09 (only). The investigative finds that given the distribution of test pits across the Stage 1 site and the consistency of fill materials between test pit locations, it appears fill materials are constrained to the north-western portion of the Stage 1 site. Analytical data for soil indicates there does not appear to be widespread contamination to soils from historical market garden use and/or filling. However, the investigation notes that the assessment of soils was limited.



Figure 36 Location to test pits and borehole within the Stage 1 site. *Source: JBS&G*

Informed by the collection of ground water and gases within the Stage 1 site, the investigation states that there does not appear to be significant migration of contaminants from the SUEZ site to the site. However, it is noted that the

scope of investigation was limited and that additional investigations (as required for Stage 2) would confirm the extent of potential cross-site contamination.

6.8.2 Potential Impacts

Whilst the investigation identified the potential for soil and groundwater impacts within the site, the investigation did not identify the potential for contamination which would limit the future use of the site (employment lands) as facilitated by the proposed development.

Further, the potential soil and groundwater impacts identified are common contaminants. Any remediation works to be carried out would be Category 2 works under SEPP 55 and not require consent. An Unexpected Finds Protocol has been prepared (**Appendix L**) and will be implemented during the course of the works.

Notwithstanding, the proposed placement of fill on the site will prepare it for its future intended use as employment land.

6.9 Visual Impact

A Visual Impact Analysis has been undertaken to assess potential impacts on views to and from sensitive receivers outside of the Stage 1 site, noting the topography of the land and sensitivities of the South Creek corridor. The significances of potential visual impacts are determined by an analysis of existing conditions, identifying sensitive receptors and the scale of changes proposed. The assessment has been informed by photomontages prepared by Clouston (refer to **Appendix R**).

The site is identified in the PLEP 2010 as an area of scenic character and landscape values, and within the Landscape Character Strategy 2006 as a 'rural backdrop' and 'pastoral setting', with the sites Elizabeth Drive frontage also identified as being a 'primary visual backdrop'. It is also noted that Elizabeth Drive will form a primary arterial road for future access to the WSA. Accordingly, the proposed development's frontage to Elizabeth Drive will form the part of the visual gateway that welcomes visitors to Western Sydney.

6.9.1 Existing Environment

The site is situated on land that is generally flat with low rolling topography, sloping down towards the site's alignment with South Creek. The site consists of two landscape character areas, with a further four character areas identified within the surrounds (as illustrated in **Figure 37**). Within the site, the majority of the land is identified as a 'rural landscape' with areas aligning with South Creek identified as a 'creek corridor'.

Informed by the existing topography of the site, a visual catchment has been identified as illustrated in **Figure 37**. The visual catchment of the site extends to the east of the site and covers a significant area. The visual catchment includes pastoral areas, industrial developments, low density residential developments and riparian lands associated with Kemps Creek. This context informs an assessment of visual impact, including the identification of selection criteria in which visualisations have been produced.

Methodology

A number of sources for selection of key views was informed by:

- · Visual assessment policy guidance, in particular the NSW Land and Environment Court Planning Principles;
- Desktop analysis and mapping;
- Viewshed analysis;
- Field evaluation; and
- The applicable SEARS (as addressed in Section 1.3)

This process has resulted in the identification of eight key views and vistas, as illustrated in **Figure 39**. Based on the above sources of view selection, a number of selection criteria for identification of key views was established, and includes, in order of priority:

- 1. Views from the public domain (principally streets, parks and roads)
- 2. Views of pedestrians and cyclists (generally limited in number, given the absence of paths and cycleways on Elizabeth Drive)
- Close and direct views from adjacent residential properties (the closest are to the southern side of Elizabeth 3. Drive)
- 4. Views from transport (private and public)

As shown in Figure 38 highlighting the viewshed of the site, the principal catchment area is to the east of the site.

Key views were then analysed using the following factors to form an overall impact rating:

- receptor sensitivity;
 - being the sensitivity of the receptor to change in the visual scene;
- quantum of view;
 - the openness of the view and the angle of view to the scene;
- distance of view:
 - the distance between the receptor and the site; _
- period of view; and
 - the length of time the receptor is exposed to the view; _
- scale of change.
 - A quantitative assessment of the change in compositional elements of the view.

Each of these factors resulted in the analysed view being given a rating of negligible (zero), low impact (one point), moderate impact (two points) or high impact (three points).

A ratings matrix (Table 29) is then used to identify the view rating in terms of each of the key factors, resulting in an assessment criteria average which provides the overall visual impact rating.

	visual imputer allings				
Score	Rating	Description			
0 - 1	Negligble	Only an insignificant part of the Project is discernible.			
1 – 1.3	Low	The Project constitutes only a minor component, which might be missed by the casual observer or receptor. Awareness of the proposal would not have a marked effect on visual amenity.			
1.4 – 1.7	Moderate/low	Whilst discernible, the Project does not dominate the visual scene and has only slight impacts on visual character.			
1.8 – 2.3	Moderate	The Project may form a visible and recognisable new element within the overall scene that affects and changes its overall character.			
2.4 – 2.6	Moderate/high	The Project is a discernible feature of the scene leading to moderately high impacts on visual character.			
2.7 - 3	High	The Project becomes the dominant feature of the scene to which other elements become subordinate, and significantly affects and changes the visual character.			

Table 29	Visual	impact	ratings
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Source: Cloustons

Findings for each of the analysed views are detailed below.



Figure 37 Existing landscape character Source: Cloustons



Figure 38 Estimated viewshed of the site based on topography Source: Cloustons



 Figure 39
 Key views and vistas of the site

 Source: Cloustons
 Source: Cloustons

6.9.2 Potential Impacts

While the resulting landform is permanent, future development of the EEP (subject to separate applications) will ultimately affect the visual impact associated with this application. Therefore, visual impacts associated with the proposed works as sought under this application are temporary in nature. The proposed landform will be temporarily undeveloped, consisting of exposed earth to be immediately seeded and covered.

The key objective of the proposed works is to facilitate the future development of the site which will provide a high level of amenity for future employees through the development of employment lands, open space, roads and other civil infrastructure. Notwithstanding the temporary nature of potential visual impacts, the following assessment of visual impacts specifically addressing the works as proposed are detailed in **Table 30**. As described above, the assessment assigned the following ratings to a numeric score:

- 0 points negligible impact;
- 1 point low impact;
- 2 points moderate impact; and
- 3 points high impact.

Viewpoint	Receptor Type	Receptor Sensitivity	Distance	Quantum of View	Period of View	Scale of Chance	Visual Impact Rating
Viewpoint 1	Public	1	3	2	1	2	Moderate
Viewpoint 2	Public	2	3	1.5	1	2	Moderate
Viewpoint 3	Public	2	3	2.5	1	2	Moderate
Viewpoint 4	Public	2	3	3	1	3	Moderate- High
Viewpoint 5	Public	2	3	2.5	1.5	2.5	Moderate
Viewpoint 6	Public	2.3	3	2.5	2	2.2	Moderate- High
Viewpoint 7	Public	2	3	2	1.5	1.8	Moderate
Viewpoint 8	Public	3	3	2	3	2.2	Moderate- High

Table 30 Summary of potential visual impacts

In addition to the above, the following brief summary of future views is provided for each view point.

Viewpoint	Assessment
Viewpoint 1	This view of the existing semi-rural land on site will be replaced with views of the bulk earthworks.
Viewpoint 2	The visibility of the earthworks and associated elements in the foreground will be partially obscured due to the sloped batter and the platform level being approximately 5.5m below the level of the existing road.
Viewpoint 3	The earthworks platform for future Lot 2 (subject to separate approval) will be visible from this viewpoint.
Viewpoint 4	The proposed earthworks will result in a level change of approximately 1 metre above the existing surface level of Elizabeth Drive, and there are very few existing trees between this viewpoint and the new site.
Viewpoint 5	The proposed earthworks for Lot 1 and 2 will occupy a significant portion of view from this viewpoint.
Viewpoint 6	Due to the proposed earthworks, the platform level of the proposed lot 2 and 3 will be lower than the surface level of existing ground and Elizabeth Drive.
Viewpoint 7	Looking west along Elizabeth Drive the site is partly obscured by the existing embankment and mature vegetation running along the site's southern boundary.

Table 31 Assessment of visual impacts

Viewpoint	Assessment
Viewpoint 8	From this viewpoint the earthworks platform for Lot 3 is approximately 4.5m below the existing level of Elizabeth Drive.

Source: Clouston Associates

It must however be noted that the LUIIP will facilitate major change in land uses and the character of the Aerotropolis, and that while the proposed bulk earthworks result in a moderate to moderate-high visual impact, this is in the context of the existing rural landscape. The proposed bulk earthworks are therefore temporary in their visual impact on the landscape character of the area.

6.9.3 Mitigation Measures

In respect of the potential visual impact described above, the assessment provides various applicable mitigation approaches. These include:

- Design Brief the identification of significant views in planning documents and the integration of these into the Design Brief;
- Avoidance this approach implies relocating the proposal elsewhere on the site with lesser visual impacts or not proceeding with the proposal on the site at all;
- · Reduction mitigate impacts through the reduction of some part of the proposed structure or development;
- · Alleviation incorporating design refinements to the proposal to mitigate visual impacts;
- · Off-site compensation provide adequate visual impact mitigation for off-site visual receptors; and
- Management an operational or management action such as construction management to minimise impacts.

Given the temporary nature of visual impacts associated with the proposed works, ground cover by way of new plantings will be used to mitigate visual impacts. This mitigation method has informed the assessment of potential visual impacts. Generally, the proposed development will result in visual impacts that are considered appropriate for the location and the future vision of the broader area. Mitigation measures relating to visual impact are included in **Table 32**.

Impact	Environmental Safeguard	Responsibility	Timing
Visual impacts on the surrounds (general)	Retaining and protecting existing roadside vegetation wherever practical and effective, especially on Elizabeth Drive.	Construction contractor	Pre-construction / construction
	Planting the proposed landscape buffer zone on the western and southern boundaries of the site with mixed plantings of tree groups and shrubs, creating filtered views to the site and buildings (not screening them)	Construction contractor / project manager	Pre-construction / construction
	Selecting tree species to match the existing landscape character of this locality.	Construction contractor / project manager	Pre-construction / construction
Visual impact on surrounding residential dwelling	Tree planting may be provided on the surrounding residential land upon request and subject to negotiation.	Project manager	Pre-construction / construction
Temporary visual impacts associated with construction	Undertake construction activity in line with the Construction Management Plan. Impacts associated with construction are considered negligible.	Project manager/ construction contractor	Pre-construction / construction

Table 32 Summary of mitigation measures relating to visual impact

6.10 Heritage

The proposed development is supported by a Statement of Heritage Impact and Archaeological Survey Report, prepared by Artefact and included in **Appendix I** and **Appendix J**. The assessment considered heritage items and archaeological remains within the site in the context of potential impacts as caused by the proposed development.

The statement is informed by historical records, desktop studies and fieldwork observations with a site inspection undertaken on 20 March 2018.

6.10.1 Existing Environment

The land containing the study area was the location of James Badgery's landholdings, who used the land for farming purposes. It was on this land that Badgery established 'Exeter Farm', raising cattle to be sold at market. In 1810 (it is estimated), construction of a brick farmhouse commenced, and was finished in 1812. A range of other structures were also constructed around this time period including convict dwellings, sheds and barns. The farm was eventually sold in 1869, before being broken into various smaller farms for sale. Elizabeth Drive itself, forming the southern boundary of the subject site, was originally constructed in the early 1800s to provide access to local land grants.

The study area is situated on a slight slope and low-relief ridgeline, with the eastern portion of the site descending towards South Creek. A high point on the site is approximately 200m to the east of the western boundary of the site. Various drainage lines running in an east-west direction are also located on the site.

Non-Aboriginal Heritage

The study area for the heritage assessment considered the entirety of the Stage 1 footprint. A search of relevant state and federal statutory and non-statutory heritage registers were undertaken, including preliminary archaeological assessment. These searches resulted in no identification of listed sites on the Commonwealth Heritage List, National Heritage list, the State Heritage Register or the s170 Register of Government Agency heritage items.

There are two items of locally listed heritage values under the Penrith LEP 2010 identified within 650m-1km of the site, however none identified on the site. These two nearest items are:

- McGarvie-Smith Farm (LEP #857) at its closest is approximately 650 metres west of the study area
- The Fleurs Radio Telescope Site (LEP #832) at its closest is approximately 1000 metres north of the study area

The Fleurs Aerodrome, located approximately 450m north of the study area, has previously been identified by Artefact as having some heritage values and is likely to meet the threshold for local significance, however is not currently a listed heritage item.

No items of heritage significant under the Liverpool LEP 2008 were identified within 1km of the study area.

A preliminary archaeological assessment was completed for the study area due to the location of the Exeter Farm farmhouse, brick cottage and various sheds associated with the historical use. The findings of this archaeological survey identify that there is a moderate to high potential for remains of the former Exeter Farm buildings to be found towards the western boundary of the site, near to the current dwelling structure.

The assumed location of these items is shown in Figure 40.



Figure 40 Potential location of archaeological remains of the Exeter Farm and buildings Source: Artefact Source: Artefact

Aboriginal Heritage

An Aboriginal archaeological survey was conducted on 20 March 2019 in conjunction with a representative from the Deerubbin LALC to locate and identify Aboriginal sites and objects or areas of Potential Archaeological Deposits (PADs). Four Aboriginal sites were identified during the survey, with three PADs identified. Further, the assessment of Aboriginal sites was informed by multiple prior studies, including those undertaken for the WSA site and nearby developments.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) using a broad 5km buffer around the site identified a total of 54 recorded Aboriginal sites:

- Artefacts: 50 (92.6%);
- Grinding groove: 1 (1.85%);
- Modified tree (carved or scarred): 1 (1.85%); and
- Potential Archaeological Deposit: 2 (3.7%).

The recorded grinding groove site is located near to the study area; however the exact location is undetermined. It is expected that this site is located near to the banks of South Creek, to the north of the site.

The survey undertaken split the site into four survey units (**Figure 41**). Within these survey units the following items were identified:

- Survey Unit 1: three Aboriginal sites and one PAD;
- Survey Unit 2: one PAD;

- Survey Unit 3: one Aboriginal site and one PAD; and
- Survey Unit 4: no sites or PADs.

All sites were in disturbed contexts related to either dam construction or the import of fill (within survey unit 1). It is considered possible that artefacts located within the fill area were redeposited within the fill itself and subsequently these objects are considered to contain low scientific value. While further Aboriginal objects may have been imported within the fill context further investigation of this area of fill is considered to offer limited research potential.





Survey units 19024 Elizabeth Drive Enterprise Precinct LGA: Penrith

Scale: 1:7500 Size: A4 Date: 26-03-2019

0

200 400 m

Figure 41 Location of Survey Sites

Source: Artefact

These newly identified Aboriginal sites and PADs are outlined in detail in Table 33.

Table 33	Newly	identified	sites	and	PADs

Site Name	Findings
Elizabeth Precinct Artefact Scatter 01 (EPAS 01) (AHIMS ID Pending)	This site is on a raised artificial terrace within an area of surface erosion resulting from animal grazing, containing two artefacts including a single platform core fragment and a complete flake. Both artefacts are comprised of grey/ pink silcrete.
	The site is deemed to be in a disturbed context associated with imported fill. While it is considered likely that further archaeological material is present, it is unlikely to relate to an intact archaeological deposit.
Elizabeth Precinct Isolated Find 01 (EPIS 01) (AHIMS ID Pending)	This site is located on a raised artificial terrace within a surface erosion resulting from animal grazing and contained one retouched utilised piece.
	The site is deemed to be in a disturbed context associated with the import of fill. While it is considered likely that further archaeological material is present, it is unlikely to relate to an intact archaeological deposit.

Site Name	Findings
Elizabeth Precinct Isolated Find 02 (EPIS 02) (AHIMS ID Pending)	This site is located on a raised artificial terrace within a surface erosion resulting from animal grazing. The site contains one proximal flake fragment identified as a scraper. The artefact has been retouched along its right, left and proximal margins.
	The site is deemed to be in a disturbed context associated with the import of fill. While it is considered likely that further archaeological material is present, it is unlikely to relate to an intact archaeological deposit.
Elizabeth Precinct Isolated Find 03 (EPIS 03) (AHIMS ID Pending)	This site is located within a sloped landform within an exposure associated with a dam wall. The site contains one single platform core. The artefact is comprised of red silcrete and the core contains one flake scar. The artefact is considered to be ex-situ given then location of the site within a dam wall.
Elizabeth Precinct PAD 01	This site is located within the south eastern portion of SU3, associated with a slightly raised crest landform associated with the wider ridgeline which runs along the western portion of SU3. The PAD provides a good vantage point over the surrounding landscape with spur lines directly connecting the ridgeline and the resources associated with South Creek.
	Surface visibility across the site was generally low, due to dense grass cover. Observations during the site survey did not identify any significant areas of surface disturbance however historical aerials have identified that the site area was formally subject to agricultural cropping. The cropping is considered likely to have resulted in some level of vertical and horizontal displacement of potential archaeological remains however it is unlikely to have completely removed the archaeological remains.
Elizabeth Precinct PAD 02	This site is located within the central portion of SU 2, associated with a spur landform located above the confluence of two drainage lines. Spur lines adjacent to first order water courses were identified as containing above average artefact densities during excavation of the adjacent conducted for the Western Sydney airport (Navin Officer Heritage Consultants 2016) in addition the landform is consistent with the landform identified by Brayshaw (1995) as containing archaeological potential.urface visibility across this site was generally low, due to dense grass cover. Observations during the site survey did not identify any significant areas of surface disturbance however historical aerials have identified that the site was formally subject to agricultural cropping. The cropping is considered likely to have resulted in some level of vertical and horizontal displacement of potential archaeological remains however it is unlikely to have completely removed archaeological remains.
Elizabeth Precinct PAD 03	This site is located within SU1 associated with the alluvial flats/ flood plain directly adjacent to South Creek. The area of the site was identified based on its proximity to South Creek with steep slopes associated with the creek bank discounted from the site extent.
	intact landform within 200m of South Creek.

Source: Artefact

These identified Aboriginal sites and PADs have been further assessed to identify their archaeological significance, which informs the outcomes of potential impacts on these items.

·····, ····,					
Site Name	Research Potential	Representative View	Rarity	Education Potential	Overall Archaeological Significance
Elizabeth Precinct Artefact Scatter 01 (EPAS 01) (AHIMS ID Pending)	Low	Low	Low	Low	Low
Elizabeth Precinct Isolated Find 01 (EPIS 01) (AHIMS ID Pending)	Low	Moderate	Moderate	Moderate	Moderate
Elizabeth Precinct Isolated Find 02 (EPIS 02) (AHIMS ID Pending)	Low	Moderate	Moderate	Moderate	Moderate
Elizabeth Precinct Isolated Find 03 (EPIS 03) (AHIMS ID Pending)	Low	Low	Low	Low	Low

Table 34 Newly identified sites and PADs

Site Name	Research Potential	Representative View	Rarity	Education Potential	Overall Archaeological Significance
Elizabeth Precinct PAD 01	Moderate	Unknown	Unknown	Unknown	Unknown
Elizabeth Precinct PAD 02	Moderate	Unknown	Unknown	Unknown	Unknown
Elizabeth Precinct PAD 03	Moderate	Unknown	Unknown	Unknown	Unknown

Source: Artefact

6.10.2 Potential Impacts

Non-Aboriginal Heritage

As there are no listed items of local or State heritage significance on the site potential impacts to the unlisted items outlined previously are considered negligible in terms of potential indirect (visual) impacts.

Table 35 Summary of impact of surrounding items of heritage significance

Item	Findings
The Fleurs Radio Telescope Site SHI # 2260832	The Fleurs Radio Telescope Site do not include aesthetic values or views to and from the site, with the significance values of the site are primarily related to the site's historical significance. Therefore, the proposed works will result in negligible visual (indirect) impacts to the significance values of The Fleurs Radio Telescope Site.
McGarvie-Smith Farm SHI # 2260857	The significance values of McGarvie-Smith Farm are related to the aesthetic inter-war design of the rural research buildings (aesthetic significance), as well as historical and rarity significance values. The study area is separated from the McGarvie-Smith Farm by a local high point (between 60-69 metres above sea level), a series of four rural properties off Elizabeth Drive and Badgerys Creek. The SUEZ resource recovery precinct is located adjacent to both the study area and McGarvie-Smith Farm. The proposed earthworks within the study area will not be directly visible from McGarvie- Smith Farm, and the proposed works will result in negligible visual (indirect) impacts to the significance values of McGarvie-Smith Farm.
Fleurs Aerodrome Potential heritage item – unlisted	The former location of the Fleurs Aerodrome is located on the eastern side of South Creek and approximately 450 metres north of the study area. The aerodrome is located across a flat landform context, and visually separated from the study area by dense vegetation bordering both margins of South Creek. The potential local significance values of the airstrip would relate to its historical significance values, which would not be impacted by partial views of works within the study area. Therefore, the proposed works will result in negligible visual (indirect) impacts to the significance values of former location of Fleurs Aerodrome.

Source: Artefact

The proposed earthworks would have a direct impact on non-Aboriginal archaeological items of heritage significance which may be located within the site. These items may include archaeological remains associated with:

- Badgery's farmhouse (Exeter Farm);
- Convict quarters;
- At least two huts for farm assistants, including the overseer and the blacksmith;
- At least one barn; and
- Other structures and features associated with a farm complex dating to the early 19th century, including cesspits, privy, rubbish deposits, and other as yet unidentified structures such as for butchering and blacksmith's workshop.

As such, more detailed archival research is required to prepare an archaeological research design to be submitted with an application for a s139 exception or a s140 permit for test excavation. This process will be undertaken outside of this development application.

A summary of holistic impacts relating to heritage, as assessed by Artefact is detailed in Table 36.

Table 36 Statement of heritage impact		
Impact	Discussion	
What aspects of the proposal respect or enhance the heritage significance of the study area?	The proposed methodology for earthworks within the study area will be reviewed subject to the location and significance of archaeological remains identified through proposed archaeological test excavation and/ or potential refinement of the area of archaeological potential during continued archival research for the ARD. The proposal will have no physical (direct) impact on nearby heritage items. The proposal will have negligible visual (indirect) impact on nearby heritage items.	
What aspects of the proposal could have a detrimental impact on the heritage significance of the study area?	The proposed earthworks within the study area have the potential to impact local and state significant archaeological remains relating to James and Elizabeth Badgery's occupation of Exeter Farm. This includes their early 19th century farmhouse and associated structures such as the convict quarters, farm assistants' quarters, cesspits, privies, and rubbish deposits. There is also the potential for underfloor deposits associated with some of the structures, such as the farmhouse and assistant's quarters. An Archaeological Research Design (ARD) would be prepared to provide a methodology for archaeological test excavation and refinement of archival research. As the proposed methodology for earthworks will be reviewed throughout preparation of the ARD and following the results of archaeological test excavation, the final level of impact to archaeological remains is not yet known.	
Have more sympathetic options been considered and discounted?	The proposed cut and fill methodology for creating individual flat lots will support the market need for large flexible allotments to accommodate a broad range of requirements to ensure economic efficient use of the land for flexible employment generating purposes.	

Source: Artefact

Aboriginal Heritage

Based on the extent of the proposed bulk earthworks there will be a direct impact to any identified site, PAD site or portion of PAD site within the footprint of the works. Both cut and fill works as proposed will have an impact on Aboriginal sites. A summary of identified impacts is included in **Table 37**. The works are not proposed for the portion of the study area that encompasses PAD 03, however intended future uses of this area would ultimately result in a partial loss of value.

Site name/ AHIMS ID	Type of harm	Degree of harm	Consequence of ham
Elizabeth Precinct Artefact Scatter 01	Direct	Total	Total loss of value
Elizabeth Precinct Isolated Find 01	Direct	Total	Total loss of value
Elizabeth Precinct Isolated Find 02	Direct	Total	Total loss of value
Elizabeth Precinct Isolated Find 03	Direct	Total	Total loss of value
Elizabeth Precinct PAD 01	Direct	Total	Total loss of value
Elizabeth Precinct PAD 02	Direct	Total	Total loss of value
Elizabeth Precinct PAD 03	Direct	Partial	Partial loss of value

Table 37 Impact on archaeological sites

Source: Artefact

It is recommended that archaeological text excavation be conducted in accordance with the Code of Practice, and that during detailed design attempts should be made to minimise the impact on known Aboriginal sites and areas of PAD. As part of this process, an Aboriginal Heritage Impact Permit (AHIP) will be applied for, which will incorporate

an Aboriginal Cultural Heritage Assessment Report for consideration by OEH (now the Department of Planning and Industry).

6.10.3 Mitigation Measures

Mitigation measures in respect of heritage on the site is detailed in Table 38.

Impact	Environmental Safeguard	Responsibility	Timing
Heritage value of the site and the surrounds	A Heritage Management Plan (HMP) that includes an unexpected finds procedure must be prepared prior to commencement of works. OHE will be notified of relevant discoveries.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction/ Construction
	A heritage 'induction' must be undertaken by workers before commencing works. The induction will outline heritage values of the site and the surrounds.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction/ Construction
Potential Aboriginal archaeology within the site.	Archaeological test excavation will be conducted within the three areas of archaeological potential, subject to proposed impacts in accordance with the OEH Code of Practice. Test excavation will be undertaken in order to confirm the presence and geographic extent of subsurface Aboriginal objects and assess their significance to inform further recommendations.	Contractor and local Aboriginal Community	Pre-Construction
	Detailed design of the proposed works will aim minimise impact on known Aboriginal sites and areas of PAD. An updated impact assessment will be part of the Aboriginal Cultural Heritage Assessment Report (ACHAR) following refinement of the proposed cut and fill methodology and clarification of potential impacts to Aboriginal objects.	Contractor and local Aboriginal Community	Pre-Construction
	Comprehensive Aboriginal stakeholder consultation carried out in accordance with the OEH 'Aboriginal cultural heritage consultation requirements for proponents' (DECCW 2010) will be undertaken.	Contractor and local Aboriginal Community	Pre-Construction
	An application for an area based Aboriginal Heritage Impact Permit (AHIP) that covers the study area will be submitted to OEH following completion of test excavation and preparation of an ACHAR.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction
	The ACHAR will outline recommended mitigation measures for inclusion as conditions in the AHIP. Mitigation measures would be conducted following issuance of the AHIP and prior to commencement of construction	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction
Potential impacts on non- Aboriginal archaeology within the site.	A detailed archaeological assessment will be undertaken for the study area. This will include further archival research to refine the area of potential for local and state archaeological remains. Studies will involve test excavation under either a s139 exception or s140 permit.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction

Table 38 Summary of mitigation measures relating to heritage

6.11 Hazards and Risks

This section provides consideration and assessment of other hazards and risks associated with the proposed works, including bushfire, geotechnical considerations and flood risk.

6.11.1 Bushfire

A Bushfire Assessment has been prepared by Australian Bushfire Protection Planners (**Appendix Q**). The assessment addresses the requirements of *Planning for Bush Fire Protection 2006*, noting that Planning for Bush Fire Protection 2018 is not yet legislated.

The site is identified as being within a mapped 'Vegetation Category 2' bushfire prone land area, with the South Creek area mapped as 'Vegetation Category 1'. Category 1 is considered to be the highest risk for bushfire with a 100m buffer to be provided, with Category 2 considered a lower risk with a 30m buffer to be provided.

Noting that there is no subdivision works proposed as part of this application, which is exclusively for land filling, the risk of bushfire impacts on the development is considered low, as the site will be largely cleared of vegetation and consequently bushfire fuel. Further, the proposed development will not result in the addition of residential dwellings or high risk uses (i.e. hospitals or child care centres) within the site.

The assessment provides an Asset Protection Zone (APZ) and describes provisions of defensible space within the Stage 1 site. The assessment describes a 24m APZ to be applied to the western boundary of the site (the site's alignment with South Creek). However, the APZ is intended to mitigate the risk of bushfire to human life and built assets. As the proposed development does not involve the construction of built form or an increase in occupancy of the site, enforcing the APZ will be incorporated within future development, subject to a separate application. The assessment provides no additional measures to reduce or mitigate risks associated with bushfire.

6.11.2 Geotechnical

Refer to Section 6.2. The proposed works are not anticipated to be impacted by geotechnical limitations.

6.11.3 Flood risk

Refer to Section 6.1 and Appendix G.

6.12 Social and Economic Impacts

The proposal will provide social and economic benefits through effectively using the site. In this regard the social and economic impact needs to be considered in the context of the whole EEP development. The proposed fill importation and bulk earthworks are the first step in the proposed development of the site for employment uses, improving the usability of the site to enable the future development of the EEP consistent with the intended outcomes for the area under the LUIIP.

The development, upon full completion, will contribute significantly to the employment opportunities within an area close to the future WSA, supporting its establishment and growth as a 24hr operation. There is also the benefit of ensuring that the excavated natural material from large State Significant and Sydney based infrastructure and building projects (ENM and VENM and other suitable materials) will be deposited on a suitable site and not in other land fill sites and will enhance efficient disposal in a sustainable manner to optimise the construction of key infrastructure serving Greater Sydney.

This will ensure that waste such as ENM and VENM can be used effectively and not impact on the capacity of other landfills. As proposed development utilises fill generated offsite from large State Significant and Sydney based infrastructure and building projects, the proposed spoil reuse to support the development of a circular economy is at core in alignment with the objectives and planning priorities within the GSRP.

The impacts that are identified in the preceding sections, principally relate to increased construction impacts, which will generate temporary impacts to adjacent residents. However, in implementing the proposed mitigation measures the impacts of construction will be reduced for the following reasons:

- the main positive social impacts associated with the proposed works include the additional jobs generated during the construction works;
- the increased economic activity within the local area; and
- the ultimate provision of employment uses consistent with the LUIIP to compliment the adjacent WSA and Northern Gateway, while supporting the overarching goals of the GSRP and WCDP.

As with the social impact, the economic impact of the proposed development should be looked at in the context of the whole EEP. Increasing the employment population of the broader EEP development site will increase effectiveness of the Aerotropolis in terms of provision of supporting uses for the WSA. Provision of the EEP as

employment lands will assist in achieving the objectives of the LUIIP. Facilitating the delivery of employment generating development on the site will help:

- ensure jobs across the EEP development site;
- ensure the EEP will contribute to employment within the region; and
- contribute to greater employment containment in the region, and thereby contribute to a reduction in the proportion of people commuting long distances to work.

Overall the proposal will facilitate employment development as envisaged in the LUIIP and will assist in achieving employment targets outlined in the GSRP, WCDP and the LUIIP.

7.0 Justification of the Proposal

In general, investment in major projects can only be justified if the benefits of doing so exceed the costs. Such an assessment must consider all costs and benefits, and not simply those that can be easily quantified. As a result, the EP&A Act specifies that such a justification must be made having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.

This means that the decision on whether a project can proceed or not needs to be made in the full knowledge of its effects, both positive and negative, whether those impacts can be quantified or not.

The proposed development involves bulk earthworks and placement of appropriate fill materials on the site in preparation for future development of the land for employment uses. The assessment must therefore focus on the identification and appraisal of the effects of the proposed change over the site's existing condition.

Various components of the biophysical, social and economic environments have been examined in this EIS and are summarised below.

7.1 Social and Economic

The proposal will provide social and economic benefits through effectively using the site. In this regard the social and economic impact needs to be considered in the context of the whole EEP development. The proposed bulk earthworks are the first step in the development of the site for employment uses, improving the usability of the site to enable the future development of the EEP consistent with the intended outcomes for the area under the LUIIP.

This will contribute to the development of the Aerotropolis to support the WSA upon opening, and to achieve the objectives of the WCDP and the GSRP.

7.2 Biophysical

This assessment has found that while there may be minor to moderate impacts as a result of the proposal, the impacts are not considered to be of sufficient significance, either in nature or extent to be regarded as unacceptable. On balance, the beneficial outcomes of the future development of the site for employment purposes, consistent with the WSA LUIPP, WCDP and GSRP substantially outweigh any negative impacts that may arise. Mitigation and management measures outlined in **Section 8.0** and appended technical reports will further ameliorate and minimise any potential impacts.

The proposal does require offsets for impacts on 3.17ha of PCTs, and also on 2.48ha of threatened species habitat of the Southern Myotis however these have been considered and assessed as part of the BDAR completed, consistent with the BC Act. Outside of these impacts, the proposal will not affect Commonwealth land, or have a significant impact on any matters of national environmental significance and therefore a referral to the Australian Minister for Environment is not required.

7.3 Ecologically Sustainable Development

The EP&A Regulation lists 4 principles of ecologically sustainable development to be considered in assessing a project. They are:

- The precautionary principle;
- Intergenerational equity;
- · Conservation of biological diversity and ecological integrity; and
- Improved valuation and pricing of environmental resources.

An analysis of these principles follows.

Precautionary Principle

The precautionary principle is utilised when uncertainty exists about potential environmental impacts. It provides 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. The precautionary principle requires careful evaluation of potential environmental impacts in order to avoid, wherever practicable, serious or irreversible damage to the environment.

The precautionary principle has been applied to the proposal however the EIS has not identified any serious threat of irreversible damage to the environment

Intergenerational Equity

Inter-generational equity is concerned with ensuring that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. The proposal has been designed to benefit both the existing and future generations by:

- Ensuring the site is prepared for future development of the EEP as employment land, complementing the Aerotropolis;
- Implementing safeguards and management measures to protect environmental values; and
- Minimising impacts on the South Creek corridor through ensuring the works are located outside of the 1 in 100year flood extent.

The proposal has integrated short and long-term social, financial and environmental considerations so that any foreseeable impacts are not left to be addressed by future generations. Issues with potential long term implications such as waste disposal would be avoided and/or minimised through construction planning and the application of safeguards and management measures described in this EIS and the appended technical reports.

Conservation of biological diversity and ecological integrity

The principle of biological diversity upholds that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

The proposal would not have any significant effect on the biological diversity and ecological integrity of the study area.

Improved valuation, pricing and incentive mechanisms

The principles of improved valuation and pricing of environmental resources requires consideration of all environmental resources which may be affected by a proposal, including air, water, land and living things. Mitigation measures for avoiding, reusing, recycling and managing waste during construction and operation would be implemented to ensure resources are used responsibly in the first instance.

Additional measures will be implemented to ensure no environmental resources in the locality are adversely impacted during the construction or operational phases.

8.0 Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed in **Section 6.1**. These measures have been derived from the previous assessment in **Section 7.0** and those detailed in appended consultants' reports.

Table 39 Consolidated Mitigation Measures

Impact	Environmental Safeguard	Responsibility	Timing	
Stormwater and Flooding				
Mitigation measures will form part of any a	application for built form and associated uses.			
Soil and Water				
Design of civil earthworks	Minimise cut and fill activities and depths where practical to do so;	Consultant Civil Engineer	Design Phase	
Drainage	Ensure the cut surface can readily drain and will not pond water and that retaining walls do not impede subsurface flow;	Contractor	Construction	
Disposal of cut subsoil	Consider where cut subsoil will be disposed to, cut saline soil should not be placed on less saline portions of the site;	Contractor	Construction	
Future built form	Consider soil management and exposure of subsoils when designing footings, roads and service trenches; and	Contractor	Construction	
Future materiality	Consider the suitability of construction materials for the environment and design specifications to meet the expected level of exposure.	Contractor	Construction	
Verification of works	The Geotechnical Inspection and Testing Authority (GITA) shall be contracted to document and certify works undertaken by the contractor has been completed in accordance with the relevant design and specification	GITA, Consultant Civil Engineer and Contractor	Design and construction	
Waste Management				
Waste generation during construction	Classify, handle and store all removed waste in the construction compounds/laydown areas in accordance with the NSW Waste Classification Guidelines 2009: Part 1 Classifying Waste (DECCW) and Storing and Handling liquids, Environmental Protection (DECC, 2007).	Construction contractor	Construction	
Waste and resource management during construction across the proposal	Prepare a waste and resource management plan (WRMP) as a sub-plan of the CEMP. As a minimum describe the measures for handling, storing and classifying waste when "onsite" and its subsequent disposal offsite to the relevant licenced facility.	Construction contractor	Construction	
Waste disposal during construction across the proposal	Send all disposed materials to a suitably licenced waste management/landfill facility.	Construction contractor	Construction	
Waste handling and storage during construction across the proposal	Store and segregate all waste at source (e.g. the construction compounds/laydown areas) in accordance with its classification. This includes recycled and reusable materials.	Construction contractor	Construction	
Littering and site tidiness during construction and operation	Monitor for waste accumulation, littering and general tidiness to ensure operating standards of the zoo are maintained.	Construction contractor	Construction	
Resource recovery during construction across the proposal	 Apply resource recovery principles: Reuse proposal-generated waste materials onsite (e.g. topsoil, recycled aggregate) providing it meets with exemption and classification requirements 	Construction contractor	Construction	

Impact	Environmental Safeguard	Responsibility	Timing
	• Failing that, transfer the materials for use elsewhere on another site under a resource recovery exemption		
	• Employ waste segregation to allow paper, plastic, glass, metal and other material recycling. These materials could be either reused onsite or transferred to a recycling facility		
	Consider composting general putrescible waste to allow recovery. Transfer these materials offsite to a composting facility.		
Reducing primary resource demand during construction across the proposal	Use recycled and low embodied energy products to reduce primary resource demand in instances where the materials are cost and performance competitive (e.g. where quality control specifications allow).	Construction contractor	Construction
General waste management	Implement the Waste Management Plan measures as part of the CEMP	Construction contractor	Construction
Traffic and Transport			
Traffic Impacts associated with construction phases	Consistent with RMS Guide 'Traffic Control at Worksites', a Vehicle Movement Plan (VMP) will be established. The VMP will detail: Illustration of preferred travel paths for entry to and exit from the site; 	Construction Contractor	Pre-construction / Construction
	 Illustration of vehicle movement within the site, showing general manoeuvrability, accesses and sideroads; 		
	Applicable speed limits within the site;		
	Safety relating to site entry (visibility and speed from the Elizabeth Drive intersection)		
	Traffic signals and signage;		
	Designation of an on-site traffic controller;		
	 Designation of a loading supervisor; and 		
	Pedestrian safety strategy		
Traffic Impacts associated with site management (communication)	A Development of a program to monitor the effectiveness of the Construction Traffic Management Plan is to be established. This process involves communication between the Project Manager and Construction Contractor.	Project Manager/ Construction Contractor	Pre-construction / Construction
	 Considerations of the program include: Tracking heavy vehicle movements against the estimated heavy vehicle flows during the 1 works. 		
	• The identification of any shortfalls in the CTMP, and the development of revised strategies / action plans to address such issues.		
	• Ensuring that all TCPs are updated (if necessary) by "Prepare a Work Zone Traffic Management Plan" card holders to ensure they remain consistent with the set-up on-site.		
	• Regular checks to ensure all loads are departing the Site covered as outlined within this CTMP.		

Impact	Environmental Safeguard	Responsibility	Timing
Traffic Impacts associated with site management (communication)	 A Communication Strategy will be established by the Project Manager to ensure appropriate to the community and to assist the Construction Contractor in achieving minimal impacts on the surrounding road network. This will involve: The erection of appropriate signage providing advanced notice of works and any traffic control measures to be implemented. 	Project Manager	Pre-construction / Construction
	• Written notices to surrounding landowners (and tenants) likely to be directly affected by the works, prior to commencement.		
Impacts on stakeholder potentially effected by traffic impacts.	The Project Manager will ensure the appropriate stakeholders are considered in respect of traffic management: Government Agencies Roads and Maritime Services (RMS) Transport Management Centre (TMC) Department of Planning and Environment (DPE) Transport for NSW (TfNSW) Sydney Coordination Office (SCO) Local Government Penrith City Council Emergency Service Police Fire and Rescue Ambulance Local Schools Christadelphian Heritage College Kemps Creek Public School Irfan College Surrounding Landowners SUEZ Kemps Creek Animal Welfare League NSW 1970 Badgerys Creek Read 10B Martin Road	Project Manager	Pre-construction / Construction
Air Quality and Odour			
Communications	• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	Construction contractor	Construction

Impact	Environmental Safeguard	Responsibility	Timing
	 Display the head or regional office contact information. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. 		
Site management	 Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either onsite or offsite, and the action taken to resolve the situation in the log book. 	Construction contractor	Construction
Monitoring	 Perform daily on-site and off-site inspections at locations (including roads) where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary. Carry out regular site inspections to monitor compliance with the DMP, record inspection 	Construction contractor	Construction
	 results, and make an inspection log available to the local authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. 		
Site preparation and maintenance	 Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period. Keep site fencing, barriers and scaffolding clean using wet methods. Cover, seed or fence stockpiles to prevent wind erosion 	Construction contractor	Construction
Air quality emissions through vehicle movements	 Ensure all on-road vehicles comply with relevant vehicle emission standards, where applicable Ensure all vehicles switch off engines when stationary for periods of more than two minutes - no idling vehicles Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable 	Construction contractor	Construction
Dust emission management	 Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips Minimise drop heights from loading shovels and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate 	Construction contractor	Construction
Impact	Environmental Safeguard	Responsibility	Timing
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Waste management	Avoid bonfires and burning of waste materials.	Construction contractor	Construction
Track out	 Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site. 	Construction contractor	Construction
	Avoid dry sweeping of large areas.		
	• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.		
	Record all inspections of haul routes and any subsequent action in a site log book.		
	• Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).		
Demolition	 Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust) 	Construction contractor	Construction
	• Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.		
	Avoid explosive blasting, using appropriate manual or mechanical alternatives		
Noise and Vibration		-	-
Impacts at Receivers R3 through R7	• Operator attended monitoring at the sensitive receiver for (at a minimum) one 15-minute period at the commencement of the construction period and at the commencement of any significant operational event.	Construction contractor	Construction
	Letterbox drops to advise of upcoming noisy works		
Construction noise management	Implement the Construction Noise and Vibration Management Plan	Construction contractor	Construction
Construction noise impacts	 Working hours are to be restricted in accordance with the EPA Interim Construction Noise Guideline. Working hours are to be in accordance with: Between 7.00am and 6.00pm, Monday to Friday. 	Construction contractor	Construction
	Between 8.00am and 1.00pm Saturdays.		
	 No work or deliveries on Sunday and/or public holidays. 		
	If work is required to be undertaken outside normal work hours, the Contractor will need approval from the Principal. The Contractor is to provide enough information for the Principal to evaluate any potential noise impact from the proposed works.		
Construction noise impact scheduling	 Scheduling for the higher project specific noise criteria exceedance activities to be undertaken predominantly during less noise-sensitive time periods, where possible. The adjacent noise sensitive receivers should be consulted to assist in identifying their less noise sensitive time periods 	Construction contractor	Construction

Impact	Environmental Safeguard	Responsibility	Timing
	Any required night time work predicted to exceed the noise management level should aim to not affect residences for more than two consecutive nights or where possible, more than six nights over a one month period.		
Construction noise impacts	Briefing of the work team (i.e. tool box talks) in order to create awareness of the locality of sensitive receivers and the importance of minimising noise emissions.	Construction contractor	Construction
Construction noise impacts	Ensuring spoil is placed and not dropped into awaiting trucks.	Construction contractor	Construction
Construction noise impacts	Use of less noise-intensive equipment, where reasonable and feasible.	Construction contractor	Construction
The potential for exceedance of the NMLs across the proposal footprint	Strategically position plant on site to reduce noise levels at the nearest receivers.	Construction contractor	Construction
Biodiversity			
No mitigation measures proposed.			
Contamination			
No mitigation measures proposed.			
Visual Impact			
Visual impacts on the surrounds (general)	Retaining and protecting existing roadside vegetation wherever practical and effective, especially on Elizabeth Drive.	Construction contractor	Pre-construction / construction
Visual impacts on the surrounds (general)	Planting the proposed landscape buffer zone on the western and southern boundaries of the site with mixed plantings of tree groups and shrubs, creating filtered views to the site and buildings (not screening them)	Construction contractor / project manager	Pre-construction / construction
Visual impacts on the surrounds (general)	Selecting tree species to match the existing landscape character of this locality.	Construction contractor / project manager	Pre-construction / construction
Visual impact on surrounding residential dwelling	Tree planting may be provided on the surrounding residential land upon request and subject to negotiation.	Project manager	Pre-construction / construction
Temporary visual impacts associated with construction	Undertake construction activity in line with the Construction Management Plan. Impacts associated with construction are considered negligible.	Project manager/ construction contractor	Pre-construction / construction
Heritage			
Heritage value of the site and the surrounds	A Heritage Management Plan (HMP) that includes an unexpected finds procedure must be prepared prior to commencement of works. OHE will be notified of relevant discoveries.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction/ Construction
Heritage value of the site and the surrounds	A heritage 'induction' must be undertaken by workers before commencing works. The induction will outline heritage values of the site and the surrounds.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction/ Construction

Impact	Environmental Safeguard	Responsibility	Timing
Potential Aboriginal archaeology within the site.	Archaeological test excavation will be conducted within the three areas of archaeological potential, subject to proposed impacts in accordance with the OEH Code of Practice. Test excavation will be undertaken in order to confirm the presence and geographic extent of subsurface Aboriginal objects and assess their significance to inform further recommendations.	Contractor and local Aboriginal Community	Pre-Construction
Potential Aboriginal archaeology within the site.	Detailed design of the proposed works will aim minimise impact on known Aboriginal sites and areas of PAD. An updated impact assessment will be part of the Aboriginal Cultural Heritage Assessment Report (ACHAR) following refinement of the proposed cut and fill methodology and clarification of potential impacts to Aboriginal objects.	Contractor and local Aboriginal Community	Pre-Construction
Potential Aboriginal archaeology within the site.	Comprehensive Aboriginal stakeholder consultation carried out in accordance with the OEH 'Aboriginal cultural heritage consultation requirements for proponents' (DECCW 2010) will be undertaken.	Contractor and local Aboriginal Community	Pre-Construction
Potential Aboriginal archaeology within the site.	An application for an area based Aboriginal Heritage Impact Permit (AHIP) that covers the study area will be submitted to OEH following completion of test excavation and preparation of an ACHAR.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction
Potential Aboriginal archaeology within the site.	The ACHAR will outline recommended mitigation measures for inclusion as conditions in the AHIP. Mitigation measures would be conducted following issuance of the AHIP and prior to commencement of construction	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction
Potential impacts on non-Aboriginal archaeology within the site.	A detailed archaeological assessment will be undertaken for the study area. This will include further archival research to refine the area of potential for local and state archaeological remains. Studies will involve test excavation under either a s139 exception or s140 permit.	Project Manager/ Contractor/ Heritage Consultant	Pre-Construction
Hazards and Risks			
No mitigation measures proposed.			
Social and Economic Impacts			
No mitigation measures proposed.			

9.0 Conclusion

The Environmental Impact Statement (EIS) has been prepared to consider the environmental, social and economic impacts of the proposed bulk earthworks and filling on the site. The EIS has addressed the issues outlined in the SEARs (**Appendix A**) and accords with Schedule 2 of the EP&A Regulation with regards to consideration of INSERT.

Having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development, the carrying out of the project is justified for the following reasons:

- The proposed filling works provides a waste management solution for surplus material extracted from various State Significant and infrastructure projects;
- It aligns with the planning priorities outlined within the GSRP, WCDP and the WSA LUIIP;
- The future development of the site for employment uses will be consistent with the WSA LUIIP, and will result in future activation of the South Creek corridor;
- The filling works are located outside of the 100-year flood extent;
- The proposal will facilitate the establishment of complementary land uses on the site to support the Aerotropolis and WSA; and
- It will contribute to the Western Economic Corridor, consistent with the GSRP and WCDP, upon full development as employment uses.

Given the merits described above it is requested that the application be approved.