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ENVIRONMENTAL IMPACT STATEMENT

East Seaham Road Stages 5 & 6, East Seaham

CHAPTER SIX ENVIRONMENTAL MONITORING

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6. ENVIRONMENTAL MONITORING

This chapter summarises the environmental monitoring to be carried out for the project. Key issues to be addressed from the SEARS are:

- *a description of measures to manage, mitigate or offset potential impacts during construction, including unexpected (heritage, biodiversity and contamination) finds procedures; and*
- *details of how the operation and long-term care and maintenance of the development will be managed.*

6.1. Air quality

Table 6-1 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-1 Environment impacts/ risks, performance objectives and environmental monitoring for air quality

Environmental impacts/ risks	Performance objective	Environmental monitoring
Dust	Design, construct and operate the project to minimise amenity and human health based impacts from dust generation	Daily visual observation of dust emissions Monitoring of community complaints
Odours	Design, construct and operate the project to minimise odours	Monitoring of community complaints Incidence if unexpected finds e.g. odours from unexpected find of contamination
Emissions	Design, construct and operate the project to minimise emissions	Incidence of plant, vehicles, equipment and/ or machinery operating inefficiently and/ or not serviced in accordance with manufacturer's schedule

Table 6-2 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-2 Summary of key impacts and mitigation measures for air quality

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. The CEMP must be approved by Council's Environmental Risk Officer or Project Support Officer or Team Leader Environmental Planning.	Dust Odours Emissions	✓	✓	
Prepare a plan for the management of material and stockpiling. The requirements of the template QF-ENV-009 Stockpile Mgnt Plan (CAP WKS) are the minimum to be provided in the plan. The Stockpile and Material Management Plan must be approved by Council's Environmental Risk Officer or Project Support Environmental Officer or Team Leader Environmental Planning.	Dust	✓		✓ as required
Prepare an erosion and sediment control plan and install and maintain erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1, 4th Ed, 2004).	Dust	✓		✓ as required
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	Dust Odours Emissions	✓		✓
Notification of activities & consultation				
Community notification must occur in accordance with the project specific engagement plan prepared for the works. Notification of works should occur to provide advance warning of the works and potential disruptions for all sensitive land uses. Notification may consist of or use variable message signage, letterbox drop (or equivalent) for residents within 1 km of the works, website/ social media or a combination to distribute information detailing the work activities, dates and hours, impacts and mitigation measures and complaints handling contact. Notification should include the likely noise impact of the work without understating its effect and any work activities or equipment that will be particularly noisy or noticeable. Notification should be provided a minimum of 10 working days prior to the start of works.	Dust Odours	✓		✓
Handle enquiries and complaints in accordance with Council's complaints handling procedures and eliminate or reduce the source where practical.	Dust Odours		✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O

Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following:
• permissible hours of work (including for deliveries)
• site sensitivities and their relevance to the proposal including:
  ○ any significant waterways
  ○ key fish habitat
  ○ possibility of threatened species onsite and/ or adjacent to the site
  ○ possibility of endangered ecological communities onsite and/ or adjacent to the site
  ○ surrounding rural residential development.
• QF-ENV-008 Unexpected finds procedures (CAP WKS)
• erosion and sediment control requirements
• exclusion fencing requirements
• site compound areas and construction employee parking areas and designated loading/ unloading areas and procedures.
	Dust
	Odours
	Emissions
		✓		✓

General				
Demarcate the extent of works with the installation of stake rope and fluro tags or similar with fluro tape attached to the stakes and rope between the stakes. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are on request.	Dust	✓		✓ as required
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	Dust Odours Emissions	✓		Works to be completed in accordance with Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
				Statement(s)
Conduct all activities between the daylight hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturdays. No work on Sundays, public holidays or night works are permitted.	Dust Odours		✓	✓
Monitoring and unexpected finds				
Visually monitor work sites, general work areas and stockpiles for dust generation and water down with clean water or cover with tarpaulins in the event of dry and/ or windy conditions.	Dust		✓	✓ as required
Pollution prevention				
Manage construction activities to minimise water and land pollution, using the following measures: • do not carry out works such as bitumen spraying, the spraying of paint or other materials during strong winds or adverse weather conditions • monitor weather conditions for adverse weather that may increase impacts and where possible schedule works to avoid these periods. Do not undertake works during inclement weather to minimise the risk of damage to assets and ensure there is no compromise of site safety. Where severe weather is forecast, undertake all reasonable precautions to prepare and secure the site for a storm event and help minimise the potential for damage • drive to conditions on unsealed roads and/ or onsite and signpost designated access points, routes, vehicle manoeuvring areas parking areas and ensure site personnel, contractors and delivery trucks are aware of the requirements to help reduce site disturbance. Restrict vehicles and personnel to designated tracks, trails and parking areas. Where possible park and turn-around on hard, well drained surfaces • inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions • install erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1, 4th Ed, 2004) and the approved plans. Leave controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are on request. Leave erosion and sediment controls in place until the site is fully stabilized • reduce open excavations.	Dust		✓	✓ as required

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Operate, inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions. Requirements include: • ensuring plant and equipment are fitted with approved exhaust systems (to maintain exhaust emissions within acceptable standards) • personnel onsite are to be trained and proficient in the operation of plant, equipment and vehicular procedures for the required tasks and ways to reduce impacts • inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions.	Emissions		✓	✓
Stockpile, spoil and waste management				
Store all stockpiled material in a location consistent with the approved plans and a separate area designated for storage of contaminated spoil where required and manage all stockpiles on site in accordance with the NSW Managing Urban Stormwater: Soils and construction – Volume 1 4th edition and the approved stockpile management plan prepared for the site. Place stockpiles at strategic locations to mitigate environmental impacts whilst facilitating material handling requirements. Establish access routes around material stockpiles that enable access from adjoining haulage routes and store all stockpiled material in a location consistent with the approved plans and a separate area designated for storage of contaminated spoil where required.	Odours Emissions		✓	Stockpiling unlikely to occur
Provide a sufficient number of suitable and labelled receptacles for generated waste and recyclable materials and clean receptacle as required to avoid overflows.	Odours Emissions		✓	✓ as required
Remove, transport and dispose of hazardous and dangerous goods in accordance with the NSW Waste Classification Guidelines and dispose of at a waste facility licenced to accept such waste. Any transport of dangerous goods must occur with a driver possessing a dangerous goods drivers licence and dangerous good vehicle licence. All dangerous goods transport shall be in accordance with NSW Dangerous Goods (Roads and Rail Transport Act 2008 and NSW Dangerous Goods (Road and Rail) Transport Regulation 2014. Ensure hazardous goods are labelled in accordance with the requirements of the Australian Dangerous Goods Code.	Odours Emissions		✓	✓ as required
Ensure the provision and regular service of portable self-contained toilets by contractors.	Odours Emissions		✓	✓ as required

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6.2. Biodiversity

Table 6-3 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed. All of these performance objectives will ensure the project is constructed and operated in a manner that minimises adverse impacts on biodiversity.

Biodiversity offsetting would include offsetting under the NSW Biodiversity Offset Scheme and installation of nest boxes onsite.

The class and number of ecosystem credits and species credits as detailed in Biodiversity Development Assessment Report for Stages 5 and 6 of a proposed road upgrade at East Seaham Road (Wildthing Environmental Consultants 2025) would be retired to offset the residual biodiversity impacts of the development prior to works commencing on site.

The requirement to retire credits may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of ecosystem credits, as calculated by the Biodiversity Offsets Payment Calculator.

Evidence of the retirement of credits or payment to the Biodiversity Conservation Fund as detailed in Biodiversity Development Assessment Report for Stages 5 and 6 of a proposed road upgrade at East Seaham Road (Wildthing Environmental Consultants 2025) would be provided to the PSC Environmental Risk Manager, Environmental Risk Officer or appropriately nominated persons prior to works commencing.

Compensatory fauna habitat in the form of nest boxes mounted in alternate trees would be installed prior to works commencing with 2 nest boxes installed for every hollow lost. The nest boxes would be offset, constructed and installed in accordance with the Port Stephens Council Biodiversity Technical Specification 2024.

Documentary evidence of installation of the nest box/ augmented hollow/ salvaged hollow would be provided in accordance with the Bushland Schedule of Rates Tender and to the Environmental Operations Team Leader or nominated representative for approval.

Table 6-4 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed and **Table 6-5** quantifies the ecosystem credits and species credits requiring offsetting.

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Table 6-3 Environment impacts, performance objectives and environmental monitoring for biodiversity

Impact	Performance objective	Environmental monitoring
Clearing of native vegetation	Retention of mature trees and hollow-bearing trees within the retained native vegetation in the study area will facilitate the movement of mobile threatened species and provide foraging, nesting and shelter/shade resources	Observation or known loss of trees other than indicated on the plans and within exclusion zones
Connectivity (habitat fragmentation)	Eliminate the inadvertent removal vegetation to avoid further habitat fragmentation	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Movement barrier for mobile ground dwelling species via fencing	Avoid cutting off connectivity for mobile ground dwelling species	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Loss of BC Act 2016 listed TEC Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Eliminate the inadvertent removal of this TEC to be retained within the scope of the proposal	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Loss of BC Act 2016 listed TEC Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion	Eliminate the inadvertent removal of this TEC to be retained within the scope of the proposal	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Loss of threatened flora habitat	Eliminate the inadvertent removal of habitat to be retained	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Loss of *Pterostylis chaetophora* (Tall Rustyhood) habitat	Eliminate the inadvertent removal of habitat to be retained Avoid impact to retained specimens of *Pterostylis chaetophora*	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones Loss of specimens of *Pterostylis chaetophora* within known populations within the project area
Loss of *Corybas dowlingii* (Red Helmet Orchid) habitat and *Rutidosis heterogama* (Heath Wrinklewort) habitat	Eliminate the inadvertent removal of habitat to be retained within the scope of the proposal	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Loss of tree hollows and threatened *Petaurus norfolcensis* (Squirrel Glider) habitat , *Phascogale tapoatafa* (Brush-tailed Phascogale) breeding habitat, *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat) habitat, *Falsistrellus tasmaniensis* (Eastern False	A net positive increase of Squirrel Glider habitat, Brush-tailed Phascogale breeding habitat, Eastern Coastal Free-tailed Bat habitat, Eastern False-Pipistrelle habitat and Little Bent-winged Bat hunting and roosting habitat within the locality and retention of key connections	Nest boxes installed and maintained

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Impact	Performance objective	Environmental monitoring
Pipistrelle) habitat, *Miniopterus australis* (Little Bentwing Bat) hunting and roosting habitat		
Loss of *Ninox strenua* (Powerful Owl) breeding habitat and clearing of *Ninox strenua* (Powerful Owl) habitat	Retention where possible of Powerful Owl nesting habitat Avoid disturbing Powerful Owls during nesting period and avoid removing active nesting hollows	Observation or known loss of trees other than indicated on the plans and within exclusion zones Number of suitable hollow bearing nest trees retained Preclearance inspection of hollows prior to breeding period completed
Loss of *Pomatostomus temporalis temporalis* (Grey-crowned Babbler) habitat, *Pteropus poliocephalus* (Grey-headed Flying Fox) foraging habitat, *Daphoenositta chrysoptera* (Varied Sittella) habitat, *Phascolarctos cinereus* (Koala) and *Calyptorhynchus lathami* (South-eastern Glossy Black-Cockatoo) transitory habitat	Eliminate the inadvertent removal vegetation to avoid further habitat fragmentation	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones
Impact on breeding populations	Timing works to avoid critical life cycle events such as breeding for avifauna species and koalas	Clearing works completed outside the avifauna and koala breeding period
Reduced viability of adjacent habitat due to noise, dust, light spill, edge effects and weed incursion	Reduce dust, noise pollution and avoid excessive light pollution affecting adjacent habitat	See **Section 6.1 Air quality** and **Section 6.7 Noise and Vibration** and other environmental monitoring requirements in this table.
Impact on waterbodies, water quality and hydrological processes	Minimise impacts on surface water quality and quantity	See **Section 6.8 Soil and Water**
Increased risk of starvation, exposure and loss of shade or shelter	Retain mature trees and hollow-bearing trees to provide food and shelter resources within the immediate locality	Observation or known loss of trees other than indicated on the plans and within exclusion zones
Inadvertent impacts to biodiversity values and retained trees	Avoid inadvertent impact to biodiversity values and retained trees	Observation or known loss of vegetation other than indicated on the plans and within exclusion zones

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Impact	Performance objective	Environmental monitoring
Clearing of fauna habitat, resulting in arboreal fauna and/ or ground dwelling injury and/or mortality and/ or displacement of resident fauna	Avoid fauna injury and/or mortality during clearing of vegetation	Implementation of unexpected finds procedures and fauna injury mortality statistics
Inadvertent encounters and impacts to fauna	Minimise likelihood of unplanned interactions with fauna	Implementation of unexpected finds procedures and fauna injury mortality statistics
Transport of weeds and pathogens from the site to adjacent vegetation	Minimise weed infestations within adjoining vegetation	Implementation of unexpected finds procedures for priority and environmental weeds
Impact to adjoining native vegetation from dumping	Prevent degradation of retained vegetation by dumping and other human activities	Incidences of illegal dumping
Vehicle strike	Reduce the likelihood and occurrence of vehicle strikes with fauna within the locality	Incidences of vehicle strike Implementation of unexpected finds procedures and fauna injury mortality statistics where vehicle strike is the cause

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Table 6-4 Ecosystem credits requiring offsetting

PCT	Threatened ecological community	Impact area (ha)	Number of ecosystem credits required
3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	1.34	27
3431-Central Hunter Ironbark Grassy Woodland (no hollow bearing trees)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	0.36	3
4042 - Lower North Riverflat Eucalypt-Paperbark Forest	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	0.43	14

Table 6-5 Species credits requiring offsetting

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Red Helmet Orchid	*Corybas dowlingii*	1.77 ha	2
Powerful Owl	*Ninox strenua*	1.09 ha	2
Squirrel Glider	*Petaurus norfolcensis*	1.77 ha	2
Brush-tailed Phascogale	*Phascogale tapoatafa*	1.77 ha	2
Koala	*Phascolarctos cinereus*	1.77 ha	2
Tall Rustyhood	*Pterostylis chaetophora*	2.13 ha	2
Heath Wrinklewort	*Rutidosis heterogama*	1.70 ha	2

Table 6-6 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-6 Summary of key impacts and mitigation measures for biodiversity

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. The CEMP must be approved by Council's Environmental Risk Officer or Project Support Officer or Team Leader Environmental Planning.	All	✓	✓	
Prepare a plan for the management of material and stockpiling. The requirements of the template QF-ENV-009 Stockpile Mgnt Plan (CAP WKS) are the minimum to be provided in the plan. The Stockpile and Material Management Plan must be approved by Council's Environmental Risk Officer or Project Support Environmental Officer or Team Leader Environmental Planning.	Inadvertent impacts to biodiversity values Water quality impacts / decline Impacts to surrounding land uses	✓		✓ as required
Prepare a dewatering management plan in accordance with Transport for NSW technical guidelines for areas of the site requiring dewatering. The dewatering plan would include water monitoring locations to be monitored prior to, during and post completion of dewatering activities. A qualified hydrologist or environmental scientist or equivalently experienced professional will be engaged to undertake water quality monitoring activities, review collected data and advise on appropriate mitigation and management measures. The Plan must be reviewed and approved by the project Support Environment Officer or if developed by the project Support Environment Officer, reviewed and approved by the project Manager and Environmental Risk Officer.	Geomorphic impacts Alteration of flow regimes Water quality impacts / decline Impacts to surrounding land uses Timing of construction in relation to flow conditions relative to expected wet seasons	✓		
Prepare an erosion and sediment control plan and install and maintain erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1, 4th Ed, 2004).	Impact on waterbodies, water quality and hydrological processes Inadvertent impacts to biodiversity values Geomorphic impacts Alteration of flow regimes Water quality impacts / decline Impacts to surrounding land uses	✓		✓ as required

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
All documentation and notifications must be provided in accordance with the NSW Fisheries Permit requirements.	Geomorphic impacts Alteration of flow regimes Water quality impacts / decline	✓	✓	
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓		✓
Notification of activities & consultation				

Induct all personnel working onsite including workers and contractors are aware of the mitigation measures and environmental safeguards for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following:
• site sensitivities and their relevance to the proposal including:
  ○ threatened species onsite and/ or adjacent to the site
  ○ endangered ecological communities onsite and/ or adjacent to the site
  ○ hollow bearing trees onsite and/ or adjacent to the site
  ○ populations of *Pterostylis chaetophora* onsite
  ○ key fish habitat
  ○ surrounding rural residential land uses.
• erosion and sediment control requirements
• exclusion fencing requirements
• NSW Fisheries requirements.
	All	✓	✓	✓

General				

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Demarcate the extent of works with the installation of stake rope and fluro tags or similar with fluro tape attached to the stakes and rope between the stakes. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request.	All	✓		✓ as required
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All		✓	Works to be completed in accordance with Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method Statement(s)
Plan and stage works and design the site where feasible and reasonable to: • limit duration of works within defined watercourses to the minimum possible and where possible deliver the works during low flow / dry weather periods • reduce open excavations.	Geomorphic impacts to key fish habitat Alteration of flow regimes Water quality impacts / decline Impacts to surrounding land uses Timing of construction in relation to flow conditions relative to expected wet seasons	✓	✓	
Biodiversity and offsetting				
Where a tree identified for retention must be disturbed, the tree should be preferentially retained and pruned rather than cleared.	Inadvertent impact to retained trees		✓	✓
Clearly demarcate all trees to be removed in accordance with QF-ENV-001 Tree Tagging Standards and Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW March 2024).	Clearing of native vegetation Connectivity (habitat fragmentation) Increased risk of starvation, exposure and loss of shade or shelter	✓		

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
	Inadvertent impact to retained trees Clearing of Powerful Owl habitat			
All clearing of vegetation and removal of bushrock and re-use of woody debris and bushrock, must be in accordance with Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects EMF-BD-GF-0039 (TfNSW March 2024).	Clearing of native vegetation Loss of BC Act 2016 listed TEC Lower Hunter spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions and TEC Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion Loss of threatened flora habitat (including Pterostylis chaetophora (Tall Rustyhood) habitat ,Corybas dowlingii (Red Helmet Orchid) habitat and Rutidosis heterogama (Heath Wrinklewort) habitat) Loss of threatened Petaurus norfolcensis (Squirrel Glider) habitat, Phascogale tapoatafa (Brush-tailed Phascogale) breeding habitat, Ninox strenua (Powerful Owl) breeding habitat, Micronomus norfolkensis (Eastern Coastal Free-tailed Bat) habitat, Falsistrellus tasmaniensis (Eastern False Pipistrelle) habitat, Miniopterus australis (Little Bentwing Bat) hunting and roosting habitat Loss of Pomatostomus temporalis temporalis (Grey-crowned Babbler) habitat, Pteropus poliocephalus (Grey-headed Flying Fox) foraging habitat, Daphoenositta chrysoptera (Varied Sittella) habitat, Calyptorhynchus lathami (South-eastern Glossy Black-Cockatoo) transitory habitat Clearing of Powerful Owl habitat Clearing of fauna habitat, resulting in arboreal		✓	

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
	fauna injury and/or mortality Clearing of fauna habitat, resulting in ground dwelling fauna injury and/or mortality Clearing of fauna habitat and displacement of resident fauna			
Install exclusion fencing that includes temporary fencing to protect and avoid: • known populations of *Pterostylis chaetophora* onsite. • hollow bearing trees. Exclusion zone fencing must be installed in accordance with the requirements of Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW March 2024). Exclusion zones must be identified on site map within the Construction Environmental Management Plan prepared for the site.	Clearing of native vegetation Connectivity (habitat fragmentation) Loss of threatened flora habitat (including Pterostylis chaetophora (Tall Rustyhood) habitat) Increased risk of starvation, exposure and loss of shade or shelter Inadvertent impacts to biodiversity values Clearing of Powerful Owl habitat	✓		Roadside markers would be installed as part of the PSC Roadside Marker Program to guide maintenance works
Timing of vegetation clearance should occur outside the bird nesting season (late August to December) and to avoid critical life cycle events such as breeding for avifauna species and outside the koala breeding season (October to January).	Loss of Phascolarctos cinereus (Koala habitat) Impact on breeding populations	✓		
An inspection of all hollows greater than 200 mm (including those to be retained and removed) as documented in the tree schedule in the Biodiversity Development Assessment Report (Wildthing Environmental Consultants 2025) must be conducted by a suitably qualified and experienced ecologist with the assistance of an elevated work platform. Inspection must determine the suitability of the hollow for use by Powerful Owl. This activity must be completed prior to the nesting periods for Powerful Owl (May-October (OEH)). The consultant must provide a survey report to Council's Project Manager within 7 days of completion of the hollow survey and prior to the removal of any vegetation on site. The report must clearly identify the tree ID, species name and common name, hollow characteristics e.g. depth, height above ground, aperture width and any other relevant details for each hollow and include an assessment of the suitability of the hollow for use by threatened arboreal species. If a nest tree with evidence of use is identified, the survey report must also include recommendations for suitable buffer zones during the breeding/ nesting period and advice on scheduling of construction activities within the buffer zones. Council's Project	Clearing of Powerful Owl habitat	✓		

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Manager must have the report reviewed by Council's Environmental Risk or Project Support Environmental Officer or appropriately nominated persons prior to works commencing.				
All preclearance works must occur in accordance with Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects EMF-BD-GF-0039 (TfNSW March 2024). The consultant must provide a preclearance survey report in accordance with the requirements of Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects EMF-BD-GF-0039 (TfNSW March 2024) and submit the report to the Council's Project Manager within 7 days of completion of clearing activities. Council's Project Manager must have the report reviewed by Council's Environmental Risk or Project Support Environmental Officer.	Clearing of Powerful Owl habitat Clearing of fauna habitat, resulting in arboreal fauna injury and/or mortality Clearing of fauna habitat and displacement of resident fauna		✓	
All weed and pathogen management must be in accordance with Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects EMF-BD-GF-0039 (TfNSW March 2024).	Transport of weeds and pathogens from the site to adjacent vegetation		✓	✓
Existing signage in relation to discouraging illegal dumping must be maintained, or if removed replaced prior to the completion of works.	Illegal dumping Water quality impacts / decline		✓	✓
Existing signage in relation to 70km/hr speed limit designated on design plans.	Vehicle strike		✓	✓
All works must be delivered in accordance with the NSW Fisheries Permit.	Geomorphic impacts to key fish habitat Alteration of flow regimes Water quality impacts / decline Impacts to surrounding land uses		✓	
All works within the riparian zone and associated waterways present must be in accordance with Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects EMF-BD-GF-0039 (TfNSW March 2024).	Geomorphic impacts to key fish habitat Water quality impacts / decline Impacts to surrounding land uses		✓	

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Pollution prevention				
Install erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1, 4th Ed, 2004) and the approved plans. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are on request. Relevant controls include erosion and sediment controls. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are on request.	Impact on waterbodies, water quality and hydrological processes Inadvertent impacts to biodiversity values Water quality impacts / decline Impacts to surrounding land uses	✓	✓	✓ as required
Manage construction activities to minimise water and land pollution, using the following measures: • installing erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1 4th Ed 2004) and the approved plans. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request • stabilising exposed areas as soon as practically possible using turf, hydromulch, hydro seed/ sterile cover crop. Only use a hydro mulch mix of local provenance seed or sterile cover crop that is certified by the supplier as free from weeds • monitor weather conditions for adverse weather that may increase impacts and where possible schedule works to avoid these periods. Do not undertake works during inclement weather to minimise the risk of damage to assets and ensure there is no compromise of site safety. Where severe weather is forecast, undertake all reasonable precautions to prepare and secure the site for a storm event and help minimise the potential for damage. If heavy rain is forecast in the next 24 hours delay commencement or cease works until such time a suitable dry period of weather is forecast • drive to conditions on unsealed roads and/ or onsite and signpost designated access points, routes, vehicle manoeuvring areas, parking areas and ensure site personnel, contractors and delivery trucks are aware of the requirements to help reduce site disturbance. Restrict vehicles and personnel to designated tracks, trails and parking areas. Where possible park and turn-around on hard, well drained surfaces • install erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1 4th Ed 2004) and the approved plans. Leave	Geomorphic impacts to key fish habitat Water quality impacts / decline Impacts to surrounding land uses		✓	✓ as required

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request. Leave erosion and sediment controls in place until the site is fully stabilized • limit duration of works within defined watercourses to the minimum possible and where possible deliver the works during low flow / dry weather periods • reduce open excavations.				
Monitoring and unexpected finds				
Conduct daily fauna checks prior to works commencing. If fauna are encountered during the daily check or during works follow the procedures in Biodiversity Management Guideline Protecting and managing biodiversity on Transport for NSW projects (TfNSW March 2024).	Inadvertent encounters and impacts to fauna		✓	✓
Stockpile, spoil and waste management				
Store all stockpiled material in a location consistent with the approved plans and a separate area designated for storage of contaminated spoil where required and manage all stockpiles on site in accordance with the NSW Managing Urban Stormwater: Soils and construction – Volume 1 4th edition and the approved stockpile management plan prepared for the site. Place stockpiles at strategic locations to mitigate environmental impacts whilst facilitating material handling requirements. Establish access routes around material stockpiles that enable access from adjoining haulage routes and store all stockpiled material in a location consistent with the approved plans and a separate area designated for storage of contaminated spoil where required.	Water quality impacts / decline Impacts to surrounding land uses		✓	✓ as required

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6.3. Contamination and chemical/ hazardous substance management

Table 6-7 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-7 Environment impacts, performance objectives and environmental monitoring for contamination and chemical/ hazardous substance management

Environmental impacts/ risks	Performance objective	Environmental monitoring
Human health risks (to construction workers), with construction workers being most at risk from contamination or use of chemical/ hazardous substances due to the potential exposure pathways including dermal contact, inhalation or ingestion of contaminated soil and water or chemicals	The environmental values of land, including soils, subsoils and landforms, are protected from contamination and/ or impact of chemicals and hazardous substances The risk of disturbing site contamination or hazardous substances and disposal is minimised	Incidences of harm to human health Incidences of unexpected finds
Risks to the receiving environment (waters and soils). Construction work may create exposure pathways through (for example) disturbance, removal of vegetation and topsoil and dewatering. This could result in soil contamination, groundwater contamination and contamination of stormwater and waterbodies	The environmental values of land, including soils, subsoils and landforms, are protected from contamination and/ or impact of chemicals and hazardous substances The risk of disturbing site contamination or hazardous substances and disposal is minimised	Incidences of environmental harm Incidences of unexpected finds

6.3.1. Mitigation measures, impacts and timing

Table 6-8 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-8 Summary of key impacts and mitigation measures for contamination and chemical/ hazardous substance management

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓		✓
Notification of activities & consultation				
Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following: • QF-ENV-008 Unexpected finds procedures (CAP WKS) • chemical and hazardous substance management.	All	✓		✓
General				
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All	✓	✓	Works to be completed in accordance with Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method Statement(s)
Monitoring and unexpected finds				
Visually monitor for any of the signs of the following: • acid sulfate soils	All		✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
• contamination such as odour, seepage of unusual liquids from soil or rock, unusual metal objects, discolouration or staining of the rock, unusual colours, odours or sheens on groundwater, presence of underground storage tanks, potential asbestos containing material, presence of waste or rubbish or unusual colour of the soil • asbestos • coal tar. If suspected, intercepted, identified or located, stop work, cordon off the areas and follow QF-ENV-008 Unexpected Finds Procedure (CAP WKS).				
Pollution prevention				
Manage construction activities to minimise water and land pollution, using the following measures: • storage of all plant, materials and equipment must not be outside the direct works area or outside the approved compound site location and all chemicals, fuels and oils must be stored in suitable bunded areas with the capacity of the bund at least 120 per cent of the volume of the largest container stored. Do not store or collect for disposal any chemicals, fuels and/or waste within or adjacent to watercourse, drainage lines or unsealed surfaces • do not carry out works such as bitumen spraying, the spraying of paint or other materials during strong winds or adverse weather conditions • keep an emergency spill response kit onsite at all times and monitor the kit for replenishment of contents. Make all staff aware of the location of the spill kit and ensure that they are trained in its use. If a spill occurs, follow the EMS Incidence Response Procedure and immediately notify the project Manager and/ or EMS Manager • avoid refuelling of equipment or chemical handling activities outside the compound. Conduct the activities offsite where practical. If the activity must occur onsite, conduct the activity on flat ground at least 50 m from any watercourse, drainage line or sensitive area with spill containment measures in place and within a bunded area • use and store all hazardous and dangerous goods in accordance with all relevant statutory standards and procedures and manufacturer's MSDS. Retain a copy of all relevant MSDS onsite and ensure hazardous goods are labelled in accordance with the requirements of the Australian Dangerous Goods	All		✓	✓ as required

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Code • the management of concrete washout must be in accordance with the Transport for NSW Concrete washout guideline dated June, 2023.				
Stockpile, spoil and waste management				
Where possible avoid, reuse and recycle spoil and waste generated. Manage waste that cannot be avoided, reused or recycled in accordance with the *NSW Waste Avoidance and Recovery Act 2011*, and classify the waste in accordance with the NSW Waste Classification Guidelines. If being removed offsite classify waste in accordance with the NSW Waste Classification Guidelines and dispose of at a facility appropriately licenced to accept such waste. Any material reused onsite shall be compliant with *NSW Protection of the Environment Operations (Waste) Regulation 2014* and associated exemptions such as the *NSW EPRM Exemption 2014*.	All		✓	✓ as required
Remove, transport and dispose of hazardous and dangerous goods in accordance with the NSW Waste Classification Guidelines and dispose of at a waste facility licenced to accept such waste. Any transport of dangerous goods must occur with a driver possessing a dangerous goods drivers licence and dangerous goods vehicle licence. All dangerous goods transport shall be in accordance with *NSW Dangerous Goods (Roads and Rail Transport Act 2008* and *NSW Dangerous Goods (Road and Rail) Transport Regulation 2014*. Ensure hazardous goods are labelled in accordance with the requirements of the Australian Dangerous Goods Code.	All		✓	✓ as required
Ensure truck drivers are undertaking material tracking recording the source location, destination and volumes and ensure that for any material brought onto site this information is provided to the Team Leader	All		✓	✓ as required

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6.4. Flooding

Table 6-9 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-9 Environment impacts, performance objectives and environmental monitoring for flooding

Environmental impacts/ risks	Performance objective	Environmental monitoring
Flood risk impacts and future climate change including any changes to floodrisk on and offsite	Design, construct and operate the project to minimise flood risk. For local catchment flooding, for East Seaham Road cross drainage: • convey the 5% AEP local flood event without overtopping • consider the 1% AEP surface water flow over East Seaham Road to be safe (VD < 0.4 and depth below 200 mm)	Works as executed plans illustrate delivery of design intent in accordance with approved issued for construction design
Potential impacts to existing community flood emergency management and evacuation arrangements	Design, construct and operate the project to minimise flood risk including increased flood immunity of East Seaham Road in the following scenarios: • when considering flooding of the local catchment, the section of the road will remain safe and trafficable up to a 1% AEP design event • when considering flooding of the Williams River, the road will now be traversable during all events up to a 5% AEP flood	Works as executed plans illustrate delivery of design intent in accordance with approved issued for construction design

6.4.1. Mitigation measures, impacts and timing

Table 6-10 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-10 Summary of key impacts and mitigation measures for flooding

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All		✓	
Notification of activities & consultation				
Community notification must occur in accordance with the project specific engagement plan prepared for the works. Notification of works should occur to provide advance warning of the works and potential disruptions for all sensitive land uses. Notification may consist of or use variable message signage, letterbox drop (or equivalent) for residents within 1 km of the works, website/ social media or a combination to distribute information detailing the work activities, dates and hours, impacts and mitigation measures and complaints handling contact.	All	✓		
Handle enquiries and complaints in accordance with Council's complaints handling procedures and eliminate or minimise the issue where practical.	All		✓	✓
General				
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All		✓	✓ All future works to be in accordance with Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method Statement(s).

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6.5. Hazards and risks

Table 6-11 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-11 Environment impacts, performance objectives and environmental monitoring for hazards and risk

Environmental impacts/ risks	Performance objective	Environmental monitoring
Greenhouse gas emissions	Construct and operate the project to minimise greenhouse gas emissions	Incidence of plant, vehicles, equipment and/ or machinery operating inefficiently and/ or not serviced in accordance with manufacturer's schedule
Potential bushfire risks could result from activities and materials used with increased fuel loads, the use of mobile equipment, fuels and chemicals, and work on days that are classified as high fire risk	Construct and operate the project to minimise bushfire risk to personnel onsite	Incidences of harm to human health as a result of bushfires started by activities from the project Incidences of environmental harm as a result of bushfires started by activities from the project Potential near misses
Delayed response times and/or access for emergency services including fire crews, in the event of a bushfire or flood event	Construct and operate the project to minimise impacts to emergency services	Incidences of harm to human health where delays caused by the project were a contributing factor
Impacts to human health (to construction workers and local residents), local properties and the local receiving environment	Construct and operate the project to minimise the impacts of flooding	Incidences of harm to human health as a result of flooding exacerbated by construction of the project Incidences of environmental harm as a result of flooding exacerbated by construction of the project Breaches of SWMS requirements in relating to flooding and bushfire

6.5.1. Mitigation measures, impacts and timing

Table 6-12 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-12 Summary of key impacts and mitigation measures for hazards and risks

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Include emergency management for bushfire, flooding and severe weather events in the Safe Work Method Statement(s) relevant to/ prepared for the proposed works.	Potential bushfire risks could result from activities and materials used with increased fuel loads, the use of mobile equipment, fuels and chemicals, and work on days that are classified as high fire risk. Delayed response times and/or access for emergency services including fire crews, in the event of a bushfire or flood event. Impacts to human health (to construction workers and local residents), local properties and the local receiving environment.	✓		✓
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓	✓	✓
Notification of activities & consultation				
Community notification must occur in accordance with the project specific engagement plan prepared for the works. Notification of works should occur to provide advance warning of the works and potential disruptions for all sensitive land uses. Notification may consist of or use variable message signage, letterbox drop (or equivalent) for residents within 1 km of the works, website/ social media or a combination to distribute information detailing the work activities, dates and	Delayed response times and/or access for emergency services including fire crews, in the event of a bushfire or flood event. Impacts to human health (to construction workers	✓		✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
hours, impacts and mitigation measures and complaints handling contact.	and local residents), local properties and the local receiving environment.			
Notify landholders, the local community, emergency services, waste services, bus companies, NSW NPWS, relevant service providers and any other relevant stakeholders via letter, phone call or email or as otherwise appropriate, of the intention to carry out works. Notification should detail the work activities, dates and hours, impacts and mitigation measures and complaints handling contact. Notification should include the likely traffic impacts and any other relevant impacts of the work without understating its effect. Notification should be provided a minimum of 10 working days prior to the start of works.	Delayed response times and/or access for emergency services including fire crews, in the event of a bushfire or flood event.	✓		✓
Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following: • permissible hours of work (including for deliveries) ○ surrounding rural residential development. • emergency management procedures • traffic management.	Potential bushfire risks could result from activities and materials used with increased fuel loads, the use of mobile equipment, fuels and chemicals, and work on days that are classified as high fire risk. Delayed response times and/or access for emergency services including fire crews, in the event of a bushfire or flood event. Impacts to human health (to construction workers and local residents), local properties and the local receiving environment.	✓	✓	✓
General				
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All	✓	✓	✓ Complete all works in accordance with the Environmental Assessment, approved plans, approvals or permits and relevant

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
				Safe Work Method Statement(s).
Monitoring and unexpected finds				
Visually monitor traffic for excessive delays or que lengths. Notify the Team Leader and appropriate Manager (if required) and amend the TMP (if required).	Delayed response times and/or access for emergency services including fire crews, in the event of a bushfire or flood event.		✓	✓
Pollution prevention				
Operate, inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions. Requirements include: • ensuring air lines on pneumatic equipment do not leak and plant silencers are well maintained • ensuring plant and equipment are fitted with approved exhaust systems (to maintain exhaust emissions within acceptable standards) • personnel onsite are to be trained and proficient in the operation of plant, equipment and vehicular procedures for the required tasks and ways to reduce impacts • inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions.	Greenhouse gas emissions.	✓	✓	✓
Stockpile, spoil and waste management				
Opportunities to reduce resource use must be considered during implementation and operation, where reasonable and feasible.	Greenhouse gas emissions.		✓	✓

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6.6. Heritage

Table 6-13 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-13 Environment impacts, performance objectives and environmental monitoring for heritage

Environmental impacts/ risks	Performance objective	Environmental monitoring
Unexpected discovery and/ or accidental harm to Aboriginal heritage	Avoid or minimise direct and indirect impacts on known or unexpected Aboriginal values, objects and places	Incidence of unexpected finds Incidences of harm to Aboriginal heritage.
Unexpected discovery and/ or accidental harm to Aboriginal ancestral remains	Avoid or minimise direct and indirect impacts on Aboriginal ancestral remains	Incidence of unexpected finds Incidences of harm to Aboriginal ancestral remains
Unexpected discovery and/ or accidental harm to non-Aboriginal heritage	Construct and operate the project to minimise potential for harm to non-Aboriginal heritage	Incidence of unexpected finds Incidences of harm to unknown non-Aboriginal heritage
Significant harm to local heritage item, Road Alignment	Minimise direct and indirect impacts to local heritage item, Road Alignment	Harm to local heritage item, Road Alignment minimised where possible
Minor impacts to heritage sites including Homestead “Fotheringay” and Marshall & Lowe "Deptford" shipyard site, Fotheringaye	Minimise direct and indirect impacts to local heritage items, Homestead “Fotheringay” and Marshall & Lowe "Deptford" shipyard site, Fotheringaye	Harm to local heritage items, Homestead “Fotheringay” and Marshall & Lowe "Deptford" shipyard site, Fotheringaye minimised where possible Incidences of harm to known non-Aboriginal heritage
Unexpected discovery and/ or accidental harm to the stone culverts noted in the heritage inventory sheet for the heritage item Road Alignment	Minimise direct and indirect impacts to local heritage item, Road Alignment	Incidence of unexpected finds Incidences of harm to unknown non-Aboriginal heritage

6.6.1. Mitigation measures, impacts and timing

Table 6-14 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-14 Summary of key impacts and mitigation measures for heritage

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓	✓	✓
Notification of activities & consultation				
Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following: • site sensitivities and their relevance to the proposal including: ○ heritage values of the site. • QF-ENV-008 Unexpected finds procedures (CAP WKS).	All	✓	✓	✓
General				
Demarcate the extent of works with the installation of stake rope and fluro tags or similar with fluro tape attached to the stakes and rope between the stakes. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request.	All		✓	✓
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All	✓	✓	✓ Complete all works in accordance with the Environmental Assessment, approved

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
				plans, approvals or permits and relevant Safe Work Method Statement(s).
Monitoring and unexpected finds				
Visually monitor for any signs of the following: • Aboriginal objects such as stone artefacts or shell middens. All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by Heritage NSW. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying Heritage NSW and Aboriginal stakeholders. If suspected, intercepted, identified or located, stop work, cordon off the areas and follow QF-ENV-008 Unexpected Finds Procedure (CAP WKS). • Discovery of Aboriginal ancestral remains. Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity, you must: o immediately cease all work at that location and not further move or disturb the remains o notify the NSW Police and Heritage NSW' Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location o not recommence work at that location unless authorised in writing by Heritage NSW. If suspected, intercepted, identified or located, stop work, cordon off the areas and follow QF-ENV-008 Unexpected Finds Procedure (CAP WKS). • Cultural heritage item(s) including specifically stone culverts. Should any stone culverts be identified within the project area and areas of proposed work, heritage advice should be sought regarding their condition and assessment of heritage significance. If suspected, intercepted, identified or located, stop work, cordon off the areas and follow QF-ENV-008 Unexpected Finds Procedure (CAP WKS). Relics protected under Section 139 of the *NSW Heritage Act 1977*. The project area has been assessed as holding low archaeological potential for archaeological resources of heritage significance. However, it is recommended that an unexpected finds protocol be	All		✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
implemented as part of the construction management plan for the project to ensure that any unexpected archaeological finds are assessed and managed appropriately and in accordance with the Heritage Act.				

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6.7. Noise and vibration

Table 6-15 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-15 Environment impacts, performance objectives and environmental monitoring for noise and vibration

Environmental impacts/ risks	Performance objective	Environmental monitoring
Increases in noise emissions affecting nearby properties and other sensitive receivers during operation of the project	Noise emissions affecting nearby properties and other sensitive receivers during operation of the project are managed to the satisfaction of the nearby properties	Incidence of noise complaints

6.7.1. Mitigation measures, impacts and timing

Table 6-16 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-16 Summary of key impacts and mitigation measures for noise and vibration

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓	✓	✓
Notification of activities & consultation				
Community notification must occur in accordance with the project specific engagement plan prepared for the works. Notification of works should occur to provide advance warning of the works and potential disruptions for all sensitive land uses. Notification may consist of or use variable message signage, letterbox drop (or equivalent) for residents within 1 km of the works, website/ social media or a combination to distribute information detailing the work activities, dates and hours, impacts and mitigation measures and complaints handling contact. Notification should include the likely noise impact of the work without understating its effect and any work activities or equipment that will be particularly noisy or noticeable. Notification should be provided a minimum of 10 working days prior to the start of works.	All	✓	✓	✓
Handle enquiries and complaints in accordance with Council's complaints handling procedures and eliminate or minimise the issue where practical.	All		✓	✓
Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following: • permissible hours of work (including for deliveries) • site sensitivities and their relevance to the proposal including: ○ surrounding rural residential development. • noise and vibration management requirements including any site specific and relevant mitigation measures, any limitations on high	All		✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
noise generation activities, and the location of the nearest sensitive receivers • site compound areas and construction employee parking areas and designated loading/ unloading areas and procedures.				
General				
Demarcate the extent of works with the installation of stake rope and fluro tags or similar with fluro tape attached to the stakes and rope between the stakes. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request.		✓	✓	✓ as required
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All		✓	✓ Complete all works in accordance with the Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method Statement(s).
Conduct all activities between the daylight hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturdays. No work on Sundays, public holidays or night works are permitted.	All		✓	✓
Monitoring and unexpected finds				
Periodically check the site, nearby residences and other sensitive land users to proactively identify noise issues and feasible and reasonable mitigation.	All		✓	✓
Pollution prevention				

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Operate, inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions. Requirements include: • ensuring air lines on pneumatic equipment do not leak and plant silencers are well maintained • ensuring plant and equipment are fitted with approved exhaust systems (to maintain exhaust emissions within acceptable standards) • personnel onsite are to be trained and proficient in the operation of plant, equipment and vehicular procedures for the required tasks and ways to reduce impacts • inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions.	All		✓	✓
To reduce operational noise and vibration onsite: • avoid the use of equipment that generates impulsive, tonal or irregular noise. Where feasible and reasonable, adopt less-annoying alternatives to 'beeper' alarms, such as smart alarms that adjust their volume to the ambient level of noise and 'broadband' alarms • only use the necessary size and power equipment and identify and use equipment with the lowest noise emissions in its class to complete specific tasks e.g. prioritise the use of super-silenced compressors, silenced jackhammers and damped bits and select the most effective mufflers, enclosures and low-noise tool bits and blades. Always seek the manufacturer's advice before modifying plant, equipment or vehicles to reduce noise • use portable plant, machinery or equipment with the potential to create high levels of noise that incorporates effective noise control. Where possible locate the plant, machinery or equipment onsite to provide a natural ground barrier between the plant, machinery or equipment and any sensitive receiving environments • where feasible and reasonable, implement quiet work methods for diesel and petrol engines and pneumatic units (such as hydraulic or electric-controlled units) and where there is no electricity supply, consider an electrical generator away from residences or within an acoustic enclosure • avoid placing noise-producing equipment where surfaces will reflect noise or reduce the effectiveness of mitigation • maximise the offset distance between noisy plant and adjacent receivers where feasible and only have necessary equipment on site and working. Where possible, avoid mobile plant and equipment clustering near residences and other sensitive land uses • use quieter work methods with minimal vibration where feasible and reasonable • monitor weather conditions for adverse weather that may increase impacts such as noise and vibration, emissions and odours and	All		✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
where possible schedule works to avoid these periods. Do not undertake works during inclement weather to minimise the risk of damage to assets and ensure there is no compromise of site safety. Where severe weather is forecast, undertake all reasonable precautions to prepare and secure the site for a storm event and help minimise the potential for damage. If heavy rain is forecast in the next 24 hours delay commencement or cease works until such time a suitable dry period of weather is forecast • do not alter designated access and egress. Inform truck drivers of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices, such as minimising use of engine brakes and avoiding engine idling • optimise the number of vehicle trips to and from the site. For example to minimise noise and congestion, where possible, organise amalgamated loads rather than using several vehicles with smaller loads and minimise the number arriving at any one time • ensure personnel onsite are to be trained and proficient in the operation of plant, equipment and vehicular procedures for the required tasks, and ways to reduce impacts • inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions • restrict and schedule deliveries to standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturdays. Where deliveries must be made during the evening or night-time (or on weekends or public holidays), schedule vehicle movements to avoid residential streets where possible and ensure requirements are clearly communicated. Identify a parking area away from noise sensitive receivers for deliveries that arrive prior to the site being open and ensure the loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers • locate compounds and anything within the compound away from sensitive receivers • monitoring for atypically high noise levels and/or annoying characteristics and removing the equipment from operation until repaired or replaced.				

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6.8. Soil and water

For impacts to riparian lands and groundwater dependant ecosystems and key fish habitat see **Section 5.2 Biodiversity**

Table 6-17 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-17 Environment impacts, performance objectives and environmental monitoring for soil and water

Environmental impacts/ risks	Performance objective	Environmental monitoring
Erosion and sedimentation	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Pollution incidents Visual monitoring of waterways
Exposure of acid sulfate soils and/ or saline soils and/ or contaminated soils	Avoid or minimise direct and indirect impacts from exposure of acid sulfate soils and/ or saline soils and/ or contaminated soils	Incidence of unexpected finds. Incidences of environmental harm
Soil, surface water or groundwater contamination	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Pollution incidents
Structural changes in creek lines due to flow induced changes in geomorphology, or hydrological changes	Construct and operate the project to minimise adverse long term impacts on watercourse geomorphology and hydrology	Visual monitoring of waterways
Mobilisation of dust, litter and other pollutants into waterways	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Pollution incidents Visual monitoring of waterways
Leakage or spillage of oils, fuel and/or chemicals from machinery or equipment, during refuelling or by accidental spill, resulting in pollutants entering waterways	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Pollution incidents Visual monitoring of waterways
Concreting activities resulting in accidental runoff of concrete washout water into waterways leading to water pollution	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Pollution incidents Visual monitoring of waterways
Nutrients in runoff could lead to algal blooms and aquatic weed growth, which could impact aquatic ecosystems and livestock	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Visual monitoring of waterways
Reduced visual amenity from turbid water and visible gross pollutants, impacting visual	Manage surface water discharges from the project during construction and operation, to achieve a neutral or beneficial effect	Visual monitoring of waterways

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amenity		
Increase in scour and erosion potential due to increase in impervious surface, mitigated by the roadside drainage channels	Construct and operate the project to minimise adverse long term impacts on watercourse geomorphology and hydrology	Visual monitoring of waterways
Potential for groundwater interaction and possible minor localised lowering of the water table	Construct the project to minimise adverse long term impacts on groundwater (minimising the volume and rate of groundwater inflow to the project area, minimising the magnitude and extent of groundwater drawdown)	Daily volumes and flow rates recorded during dewatering activities

6.8.1. Mitigation measures, impacts and timing

Table 6-18 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-18 Summary of key impacts and mitigation measures for soil and water

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Prepare a dewatering management plan in accordance with Transport for NSW technical guidelines for areas of the site requiring dewatering. The dewatering plan would include provisions for water monitoring prior to, during and post completion of dewatering activities. A qualified hydrologist or environmental scientist or equivalently experienced professional will be engaged to undertake water quality monitoring activities, review collected data and advise on appropriate mitigation and management measures. The Plan must be reviewed and approved by the project Support Environment Officer or if developed by the project Support Environment Officer reviewed and approved by the project Manager and Environmental Risk Officer.	Erosion and sedimentation Soil, surface water or groundwater contamination Potential for groundwater interaction and possible minor localised lowering of the water table	✓		
Prepare a plan for the management of material and stockpiling and include the plan in the CEMP. The requirements of the template QF-ENV-009 Stockpile Mgnt Plan (CAP WKS) are the minimum to be provided in the plan. The Stockpile and Material Management Plan must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning. All works must be performed in accordance with the requirements of the Stockpile and Material Management Plan.	Erosion and sedimentation Mobilisation of dust, litter and other pollutants into waterways Reduced visual amenity from turbid water and visible gross pollutants, impacting visual amenity	✓		
Prepare an erosion and sediment control plan in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1 4th Ed 2004) and include the plan in the CEMP. The sediment and erosion controls must have the aim of achieving an outcome of no visible turbid plumes reaching the waterway for any rainfall event up to a 1 in 2 year average recurrence interval event.	Erosion and sedimentation	✓		✓ as required
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and	All	✓	✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
directions from the site manager.				
Notification of activities & consultation				
Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following: • site sensitivities and their relevance to the proposal including: ○ any significant waterways. • QF-ENV-008 Unexpected finds procedures (CAP WKS) • chemical and hazardous substance management • erosion and sediment control requirements • site compound areas and construction employee parking areas and designated loading/ unloading areas and procedures • emergency management procedures • site compound areas and construction employee parking areas and designated loading/ unloading areas and procedures.	All	✓	✓	✓
General				
Demarcate the extent of works with the installation of stake rope and fluro tags or similar with fluro tape attached to the stakes and rope between the stakes. Leave all controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request.	Erosion and sedimentation Structural changes in creek lines due to flow induced changes in geomorphology, or hydrological changes Increase in scour and erosion potential due to increase in impervious surface, mitigated by the roadside drainage channels	✓	✓	✓ as required

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All		✓	✓ Complete all works in accordance with the Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method Statement(s).
Conduct works in accordance with the recommendations of the final geotechnical report titled Report on Pavement Investigation East Seaham Road, Stage 5 East Seaham (Cardno, 4 October 2017) and Pavement and Investigation and Design East Seaham Road East Seaham Report Ref: G0558-R-001-REV0 (Hunter Civilab, 25 June 2024), except where varied by the approved plans.	Erosion and sedimentation Structural changes in creek lines due to flow induced changes in geomorphology, or hydrological changes Increase in scour and erosion potential due to increase in impervious surface, mitigated by the roadside drainage channels		✓	✓
Monitoring and unexpected finds				
Undertake daily checks of site drainage systems and undertake maintenance when required to ensure site drainage systems are operating at capacity e.g. removal of debris and that there is no increase in turbidity (sediment laden water). Ensure there is no release of dirty water into drainage lines and/ or watercourse.	Erosion and sedimentation Mobilisation of dust, litter and other pollutants into waterways Leakage or spillage of oils, fuel and/or chemicals from machinery or equipment, during refuelling or by accidental spill,		✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
	resulting in pollutants entering waterways Nutrients in runoff could lead to algal blooms and aquatic weed growth, which could impact aquatic ecosystems and livestock Reduced visual amenity from turbid water and visible gross pollutants, impacting visual amenity Increase in scour and erosion potential due to increase in impervious surface, mitigated by the roadside drainage channels			
Visually monitor work sites, general work areas and stockpiles for dust generation, and water down with clean water or cover with tarpaulins in the event of dry and/ or windy conditions.	Mobilisation of dust, litter and other pollutants into waterways		✓	✓
Visually monitor for any of the signs of the following: • acid sulfate soils • contamination such as odour, seepage of unusual liquids from soil or rock, unusual metal objects, discolouration or staining of the rock, unusual colours, odours or sheens on groundwater, presence of underground storage tanks, potential asbestos containing material, presence of waste or rubbish or unusual colour of the soil If suspected, intercepted, identified or located, stop work, cordon off the areas and follow QF-ENV-008 Unexpected Finds Procedure (CAP WKS).	Exposure of acid sulfate soils and/ or saline soils and/ or contaminated soils Soil, surface water or groundwater contamination		✓	✓
Pollution prevention				
Manage construction activities to minimise water and land pollution, using the following measures: • storage of all plant, materials and equipment must not be outside the direct works area or outside the approved compound site location and all chemicals, fuels and oils must be stored in suitable bunded	All		✓	✓ where applicable

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
areas with the capacity of the bund at least 120 per cent of the volume of the largest container stored. Do not store or collect for disposal any chemicals, fuels and/or waste within or adjacent to watercourse, drainage lines or unsealed surfaces • do not carry out works such as bitumen spraying, the spraying of paint or other materials during strong winds or adverse weather conditions • keep an emergency spill response kit onsite at all times and monitor the kit for replenishment of contents. Make all staff aware of the location of the spill kit and ensure that they are trained in its use. If a spill occurs, follow the EMS Incidence Response Procedure and immediately notify the project Manager and/ or EMS Manager • avoid refuelling of equipment or chemical handling activities outside the compound. Conduct the activities offsite where practical. If the activity must occur onsite, conduct the activity on flat ground at least 50 m from any watercourse, drainage line or sensitive area with spill containment measures in place and within a bunded area • use and store all hazardous and dangerous goods in accordance with all relevant statutory standards and procedures and manufacturer's MSDS. Retain a copy of all relevant MSDS onsite and ensure hazardous goods are be labelled in accordance with the requirements of the Australian Dangerous Goods Code • where possible wash equipment, machinery or works vehicles offsite at an approved facility. Where onsite wash down is required for weed control, use potable water and contain any excess debris from equipment with containment material. Dispose of any containment material and water in accordance with the Waste Management requirements for the works • stabilise exposed areas as soon as practically possible using turf, hydromulch, hydro seed/ sterile cover crop. Only use a hydro mulch mix of local provenance seed or sterile cover crop that is certified by the supplier as free from weeds • the management of concrete washout much be in accordance with the Transport for NSW Concrete washout guideline dated June, 2023 • monitor weather conditions for adverse weather that may increase impacts and where possible schedule works to avoid these periods. Do not undertake works during inclement weather to minimise the risk of damage to assets and ensure there is no compromise of site safety. Where severe weather is forecast,				

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
undertake all reasonable precautions to prepare and secure the site for a storm event and help minimise the potential for damage. If heavy rain is forecast in the next 24 hours delay commencement or cease works until such time a suitable dry period of weather is forecast • drive to conditions on unsealed roads and/ or onsite and signpost designated access points, routes, vehicle manoeuvring areas, parking areas and ensure site personnel, contractors and delivery trucks are aware of the requirements to help reduce site disturbance. Restrict vehicles and personnel to designated tracks, trails and parking areas. Where possible park and turn-around on hard, well drained surfaces • maintain a clean site that is free of litter and unnecessary debris with all wastes stored securely to avoid/ minimise the risk of pollutants escaping • inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions • install erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom Vol 1 4th Ed 2004) and the approved plans. Leave controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request. Leave erosion and sediment controls in place until the site is fully stabilized • works must be delivered in accordance with the NSW Fisheries Permit. • works must be delivered in compliance with the Dewatering Management Plan prepared for the site • limit duration of works within defined watercourses to the minimum possible and where possible deliver the works during low flow / dry weather periods. • reduce open excavations				
Manage construction activities to minimise the emission of visible dust beyond the construction footprint. Dust mitigation measures for each location/ activity may include one or more of the following: • visual inspection of construction sites to identify sources of dust emissions, taking into account weather conditions (particularly dry and windy conditions) and the scale, nature and intensity of construction activities	Mobilisation of dust, litter and other pollutants into waterways		✓	✓ where applicable

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
• scheduling of dust generating activities to minimise potential for elevated cumulative dust generation • locating and managing dust generating stockpiles to be located away from sensitive human and ecological receptors • application of measures to minimise dust generation from surfaces and stockpiles such as application of water sprays, spray seeding, and dust covers or similar • progressive site rehabilitation or stabilisation to minimise the potential for and duration of dust generation from disturbed areas • implementation of speed limits on unsealed roads and other trafficked surfaces • cover all loads of material, soil, fill or other erodible matter being transported to or from the work site at all times. Coverage must be maintained for the duration of transportation and until unloaded • providing stabilised site access and clean roads and access points as required. Implementing a wheel washing system at relevant construction site access points (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where practicable • minimising the number of stockpiles onsite, avoiding stockpiling in exposed areas and ensuring long-term stockpiles are covered or stabilised • where excessive dust occurs, water down with clean water(e.g. water cart) or cover with tarpaulins in the event of dry and/ or windy conditions • stabilise exposed areas as soon as practically possible using turf, hydromulch, hydro seed/ sterile cover crop. Only use a hydro mulch mix of local provenance seed or sterile cover crop that is certified by the supplier as free from weeds • monitor weather conditions for adverse weather that may increase impacts such as dust and where possible schedule works to avoid these periods. Do not undertake works during inclement weather to minimise the risk of damage to assets and ensure there is no compromise of site safety. Where severe weather is forecast, undertake all reasonable precautions to prepare and secure the site for a storm event and help minimise the potential for damage. If heavy rain is forecast in the next 24 hours delay commencement or cease works until such time a suitable dry period of weather is forecast • drive to conditions on unsealed roads and/ or onsite and signpost designated access points, routes,				

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
vehicle manoeuvring areas, parking areas and ensure site personnel, contractors and delivery trucks are aware of the requirements to help reduce site disturbance. Restrict vehicles and personnel to designated tracks, trails and parking areas. Where possible park and turn-around on hard, well drained surfaces • reduce open excavations.				
Operate, inspect and maintain equipment to ensure it is in good working order and operated in accordance with the manufacturer's instructions. Requirements include: • personnel onsite are to be trained and proficient in the operation of plant, equipment and vehicular procedures for the required tasks and ways to reduce impacts.	Erosion and sedimentation Leakage or spillage of oils, fuel and/or chemicals from machinery or equipment, during refuelling or by accidental spill, resulting in pollutants entering waterways Reduced visual amenity from turbid water and visible gross pollutants, impacting visual amenity		✓	✓
Stockpile, spoil and waste management				
Store all stockpiled material in a location consistent with the approved plans, with a separate area designated for storage of contaminated spoil where required and manage all stockpiles on site in accordance with the NSW Managing Urban Stormwater: Soils and construction – Volume 1 4th edition and the approved stockpile management plan prepared for the site. Place stockpiles at strategic locations to mitigate environmental impacts whilst facilitating material handling requirements. Establish access routes around material stockpiles that enable access from adjoining haulage routes.	Erosion and sedimentation Mobilisation of dust, litter and other pollutants into waterways		✓	

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6.9. Traffic and transport

Table 6-19 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-19 Environment impacts, performance objectives and environmental monitoring for traffic and transport

Environmental impacts/ risks	Performance objective	Environmental monitoring
All	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Monitoring of travel time Monitoring of traffic queuing
Increased driving distance and travel time (road closure)	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Monitoring of travel time Monitoring of traffic queuing
Decreased speed limits (partial road closure)	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Monitoring of travel time Monitoring of traffic queuing Complaints received
Periods of limited driveway access	Minimise restricted access as far as practically possible	Complaints received
Increased construction vehicles on road network from own works within locality	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Monitoring of travel time Monitoring of traffic queuing Complaints received
Increased construction vehicles on road network and possibly through site from new Clarence Town bridge construction	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Monitoring of travel time Monitoring of traffic queuing Complaints received
Emergency vehicle access	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Complaints received
Utility and NPWS access	Minimise restricted access as far as practically possible	Complaints received
Bus access restrictions	Minimise adverse impacts to the performance of the existing road network, including level of service, travel times and road safety	Service complaints

6.9.1. Mitigation measures, impacts and timing

Table 6-20 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-20 Summary of key impacts and mitigation measures for traffic and transport

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓	✓	✓
Prepare a traffic management plan in consultation with Dungog Council and emergency services, waste services and any other relevant service providers and NSW NPWS and include the plan in the CEMP. The traffic management plan must include: • measures to minimise and manage construction traffic and road safety impacts on other road users, including buses • planning to minimise the movement of construction heavy vehicles during the AM and PM peak hours, weekends and public holidays, where practicable • measures to provide safe and adequate access to residential premises and businesses during construction, particularly where construction activities affect existing property access arrangements • details of the types of temporary traffic management measures that would be required during construction, such as posted speed limit reductions, detours and full or partial road closures, and how these measures would be managed to minimise impacts on other road users • measures to periodically update landholders, the local community, emergency services, waste services, bus companies, NSW NPWs, relevant service providers and any other relevant stakeholders on the staging and progress of construction works, and to maintain safe adequate access during the construction period • a framework for coordinating construction planning and traffic management with Dungog Council to	All	✓		

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
minimise potential cumulative construction traffic impacts • traffic controls that are fauna friendly. Barrier devices such as concrete jersey kerbs or water filled barriers must have provision for fauna escape with a 2-300mm gap for every 2 barriers or climbable fauna structures secured to the barrier devices.				
Notification of activities & consultation				
Community notification must occur in accordance with the project specific engagement plan prepared for the works. Notification of works should occur to provide advance warning of the works and potential disruptions for all sensitive land uses. Notification may consist of or use variable message signage, letterbox drop (or equivalent) for residents within 1 km of the works, website/ social media or a combination to distribute information detailing the work activities, dates and hours, impacts and mitigation measures and complaints handling contact. Notification should be provided a minimum of 10 working days prior to the start of works. Where works are likely to affect driveway entrances; specific notification by letterbox drop, phone call or email (or equivalent) shall be provided no later than 5 working days ahead of construction activities. The specific notification must provide additional information specific to the period the driveway may be restricted. Notification must be provided to residences that are likely to have persons present at the time works are occurring.	Increased travel time Increased driving distance and travel time (road closure) Decreased speed limits (partial road closure) Periods of limited driveway access Increased construction vehicles on road network from own works within locality Increased construction vehicles on road network and possibly through site from new Clarence Town bridge construction	✓	✓	✓
Notify landholders, the local community, emergency services, waste services, bus companies, NSW NPWs, relevant service providers and any other relevant stakeholders via letter, phone call or email or as otherwise appropriate of the intention to carry out works. Notification should detail the work activities, dates and hours, impacts and mitigation measures and complaints handling contact. Notification should include the likely traffic impact and any other relevant impacts of the work without understating its effect. Notification should be provided a minimum of 10 working days prior to the start of works.	All	✓	✓	✓
Continue to liaise with and notify Dungog Council of the commencement of works and ensure Traffic Management Plans for each project consider the impacted works and communicate any impacts to the community throughout the Construction period as required.	Increased construction vehicles on road network and possibly through site from new Clarence Town bridge construction	✓	✓	

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Handle enquiries and complaints in accordance with Council's complaints handling procedures and eliminate or minimise the issue where practical.	All			

Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following:
• permissible hours of work (including for deliveries)
• site sensitivities and their relevance to the proposal including:
  ○ surrounding rural residential development
  ○ traffic management.
	All	✓		✓

General				
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All		✓	✓
Conduct all activities between the daylight hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturdays. No work on Sundays, public holidays or night works are permitted.	All		✓	✓
Transport & traffic				
Install traffic controls and leave all traffic controls in place during works, undertake weekly checks and also conduct checks before and after rainfall and promptly correct any issues. Keep records of any checks and issues onsite and ensure they are available upon request.	All		✓	✓
Sufficient car parking spaces will be provided within the project construction sites to accommodate anticipated construction worker parking requirements.	Periods of limited driveway access		✓	

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
Monitoring and unexpected finds				
Visually monitor traffic for excessive delays or queue lengths. Notify the Team Leader and appropriate Manager (if required) and amend the TMP (if required).	Increased travel time Increased driving distance and travel time (road closure) Decreased speed limits (partial road closure) Increased construction vehicles on road network from own works within locality Increased construction vehicles on road network and possibly through site from new Clarence Town bridge construction		✓	✓

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6.10. Waste management

Table 6-21 describes the environment impacts/ risks and the associated performance objectives and environmental monitoring proposed.

Table 6-21 Environment impacts, performance objectives and environmental monitoring for waste management

Environmental impacts/ risks	Performance objective	Environmental monitoring
Resource use	Maximise opportunities to reduce resource use and water consumption	Resource usage
Waste generation and disposal	Manage waste in accordance with the resource management hierarchy including minimisation and reuse of waste to protect environmental values	Waste volumes and disposal methods
Pollution and. or contamination of the local environment	Manage waste in accordance with the resource management hierarchy including minimisation and reuse of waste to protect environmental values	Waste volumes and disposal methods Pollution incidents

6.10.1. Mitigation measures, impacts and timing

Table 6-22 describes the mitigation measures being implemented to address the identified environmental impacts and illustrates the timing of when the risk will occur and when the mitigation measures would be implemented.

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Table 6-22 Summary of key impacts and mitigation measures for waste management

Mitigation measure	Impact addressed	Timing		
		PC	C	O
Documentation				
Prepare a CEMP that includes all the mitigation measures identified in the Environmental Assessment and any relevant permits or approvals. **The CEMP must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.**	All	✓		
Prepare a plan for the management of material and stockpiling and include the plan in the CEMP. The requirements of the template QF-ENV-009 Stockpile Mgnt Plan (CAP WKS) are the minimum to be provided in the plan. The Stockpile and Material Management Plan must be approved by Council's Environmental Risk Officer or project Support Environmental Officer or Team Leader Environmental Planning.	Waste generation and disposal Pollution and. or contamination of the local environment	✓		
Prepare a waste management plan and include the plan in the CEMP. The plan must specify measures to manage waste such as: • expected waste types and volumes • procedures for managing waste materials • waste reporting requirements • disposal requirements.	All	✓		✓ as required
Include appropriate clauses and conditions within tenders, employment contracts, subcontractor agreements and work method statements that require all workers and contractors to observe the Environmental Safeguards and directions from the site manager.	All	✓		✓
Notification of activities & consultation				
Induct all personnel working onsite including workers and contractors to ensure they are aware of the mitigation measures and environmental safeguards, for example through site inductions and 'toolbox talks' and by providing a summary of relevant project requirements for quick reference (such as a noticeboard). Emphasize the following:	All	✓	✓	✓

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
• waste management procedures and requirements.				
General				
Complete all works in accordance with the Environmental Assessment, approved plans, Construction Environmental Management Plan, approvals or permits and relevant Safe Work Method Statement(s).	All		✓	✓ Complete all works in accordance with the Environmental Assessment, approved plans, approvals or permits and relevant Safe Work Method Statement(s).
Stockpile, spoil and waste management				
Store all stockpiled material in a location consistent with the approved plans, with a separate area designated for storage of contaminated spoil where required and manage all stockpiles on site in accordance with the NSW Managing Urban Stormwater: Soils and construction – Volume 1 4th edition and the approved stockpile management plan prepared for the site. Place stockpiles at strategic locations to mitigate environmental impacts whilst facilitating material handling requirements. Establish access routes around material stockpiles that enable access from adjoining haulage routes.	Waste generation and disposal Pollution and. or contamination of the local environment		✓	✓ as required
Where possible avoid, reuse and recycle spoil and waste generated. Manage waste that cannot be avoided, reused or recycled in accordance with the *NSW Waste Avoidance and Recovery Act 2011*, and classify the waste in accordance with the NSW Waste Classification Guidelines. If being removed offsite classify waste in accordance with the NSW Waste Classification Guidelines and dispose of at a facility appropriately licenced to accept such waste and/ or at GNAPL in accordance with the signed MoU. Any material reused onsite shall be compliant with *NSW Protection of the Environment Operations (Waste) Regulation 2014* and associated exemptions such as the *NSW EPRM Exemption 2014*.	Waste generation and disposal Pollution and. or contamination of the local environment		✓	✓
Provide a sufficient number of suitable and labelled receptacles for generated waste and recyclable materials and	Waste generation and disposal		✓	✓ as required

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Mitigation measure	Impact addressed	Timing		
		PC	C	O
clean receptacles as required to avoid overflows.	Pollution and. or contamination of the local environment			
Remove, transport and dispose of hazardous and dangerous goods in accordance with the NSW Waste Classification Guidelines and dispose of at a waste facility licenced to accept such waste. Any transport of dangerous goods must occur with a driver possessing a dangerous goods drivers licence and dangerous goods vehicle licence. All dangerous goods transport shall be in accordance with *NSW Dangerous Goods (Roads and Rail Transport Act 2008* and *NSW Dangerous Goods (Road and Rail) Transport Regulation 2014*. Ensure hazardous goods are labelled in accordance with the requirements of the Australian Dangerous Goods Code.	Waste generation and disposal Pollution and. or contamination of the local environment		✓	✓
Ensure truck drivers are undertaking material tracking, recording the source location, destination and volumes and ensure that for any material brought onto site this information is provided to the Team Leader.	Waste generation and disposal Pollution and. or contamination of the local environment		✓	✓
Any imported fill, whether VENM, ENM or other imported material such as EPRM, must be accompanied by relevant documentation. Where documentation is not provided the source site of the material will be inspected and material sampled at a rate of one sample per 100 m^3, with a minimum of 10 samples taken from each product imported.	Pollution and. or contamination of the local environment		✓	
Ensure the provision and regular service of portable self-contained toilets by contractors.	Waste generation and disposal Pollution and. or contamination of the local environment		✓	
Stockpile and store excavated topsoil separately for reuse in rehabilitation works once works are complete. Incorporate non-woody vegetation (typically grasses and groundcover species) into the stripping of topsoil to retain any organic materials and nutrients within the topsoil layer. Carry topsoil removal with care to ensure that topsoil is not mixed with subsoils, particularly where topsoil is thin.	Waste generation and disposal		✓	
Remove all physical construction elements from the site such as any physical controls, vehicles, plant and equipment, fencing such as tree protection fencing and exclusion fencing and traffic controls and leave the site clean and free of debris.	Waste generation and disposal Pollution and. or contamination		✓	✓

PORT STEPHENS COUNCIL

Environmental Assessment Level 4

Mitigation measure	Impact addressed	Timing		
		PC	C	O
	of the local environment			
Maintain a clean site that is free of litter and unnecessary debris with all wastes stored securely to avoid/ minimise the risk of pollutants escaping.	Waste generation and disposal Pollution and. or contamination of the local environment		✓	✓
Opportunities to reduce resource use and water consumption and to reuse and recycle water must be considered during implementation and operation, where reasonable and feasible.	Resource use	✓	✓	✓