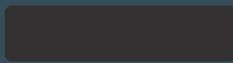
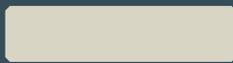
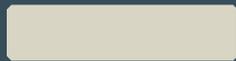
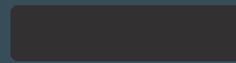




PART C

Synthesis and conclusion



**BOTANY RAIL
DUPLICATION**



**ENVIRONMENTAL
IMPACT STATEMENT**



Botany Rail Duplication

Environmental Impact Statement

Part C – Synthesis and conclusion

1 October 2019

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Title: Botany Rail Duplication

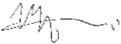
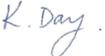
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24. APPROACH TO ENVIRONMENTAL MANAGEMENT AND MITIGATION

This chapter, together with Chapter 25 (Project justification and conclusion), provides a synthesis of the Environmental Impact Statement (EIS). This chapter compiles the key potential impacts that have not been avoided and the measures proposed to avoid, minimise, manage or offset the impacts identified in Part B. The chapter also provides the outcomes the proponent is seeking to achieve through the implementation of the mitigation measures.

24.1 Compilation of impacts

Part B of the EIS provides an assessment of the potential impacts of the project during construction and operation. The key potential impacts requiring mitigation and management (that is, the impacts that have not been avoided) are summarised in Table 24.1.

Impacts would be mitigated by implementing the environmental management procedures and plans described in section 24.2 and the mitigation measures compiled in section 24.3.

Table 24.1 Summary of key potential impacts

| ISSUE | KEY POTENTIAL IMPACTS |
|-------------------------------|---|
| Traffic, transport and access | <p>During construction of the project, there would be delays in the road network within the project area. The key construction impacts of the project on traffic, transport and access would include:</p> <ul style="list-style-type: none"> • traffic delays as a result of proposed road closure periods at Robey Street, O’Riordan Street and Southern Cross Drive and localised temporary lane closures to facilitate day-to-day construction activities, resulting in potential delays, increased travel times and impacts on bus services • minor impacts on road traffic and active transport from the movement of construction vehicles on the general road network and accessing the project site. <p>Following completion of construction, no changes to the road network, pedestrian footpaths or bus networks are proposed. Overall, the project is expected to result in long term benefits through increased rail freight efficiency and capacity across the regional and national freight network and less congestion on the road due to reduced freight movements made by trucks.</p> |
| Noise and vibration | <p>The nearest sensitive receivers to the project are relatively close in some areas. The worst-case construction noise impacts for the project are likely to be ‘high’ at certain times.</p> <p>During operation, the project is predicted to result in increased rail noise levels in the study area. The increased noise levels result in a number of areas where sensitive receivers are predicted to exceed the noise criteria levels. These areas are generally near the curved track and include:</p> <ul style="list-style-type: none"> • around King Street • near Baxter Road • near Botany Road and McBurney Avenue • along Myrtle Street. |
| Air quality | <p>In general, air quality impacts are expected to be minor and manageable through established mitigation and management measures. Potential impacts would result from the generation of dust from construction works and the movement of equipment and machinery.</p> <p>Operational air quality impacts from the project were not deemed to be significant.</p> |

| ISSUE | KEY POTENTIAL IMPACTS |
|-------------------------|--|
| Biodiversity | <p>The project would remove small areas of native vegetation (approximately 0.72 hectares) which could provide some nesting and foraging habitat for fauna species. This would not result in a significant impact on threatened species. This impact would be offset in accordance with the Biodiversity Offset Scheme.</p> <p>The project crosses the Botany Wetlands and Mill Stream. There will be minor removal of riparian vegetation. There would be no blockage of fish passage along Mill Stream, no impacts on mapped Coastal Wetlands and no impacts on threatened aquatic species as a result of the project.</p> |
| Contamination | <p>There are areas of known and potential contamination within the project site. Asbestos containing material (ACM) has been identified in several locations of the rail corridor, elevated levels of PFAS in groundwater have been recorded near the project site and part of the project site contains potential acid sulfate soils (ASS). There is also potential for contamination to be present from neighbouring historic industrial uses and further areas of potential ACM have been identified.</p> <p>Erosion, sedimentation and exposure of contaminated soils or groundwater during construction could result in the contamination of soils and surface waters. This may impact downstream water quality. Leaks and spills during construction and operation may also cause contamination impacts on soil and water.</p> |
| Hydrology, flooding | <p>The majority of construction activities and the presence of construction compounds and work sites have the potential to impact local overland flows and flood behaviour. Runoff or rainfall within the project site have the potential to cause localised flooding issues and adverse downstream impacts. During operation the project would have no significant impact on the extent of the floodplain or its hazard categorisation. Changes in flooding patterns would not result in a significant change to the Flood Planning Area, the future development potential of land located outside the project footprint, or the social and economic costs of flooding.</p> |
| Water quality and soils | <p>Construction of the project has the potential to result in surface water impacts such as increased sedimentation, erosion, pollutants and contaminants, which could reduce existing water quality and harm aquatic ecosystems. However, these potential impacts are likely to be temporary and minor and would be minimised through management and the implementation of mitigation measures.</p> <p>Negligible adverse groundwater and surface water impacts are expected during construction and operation of the project, providing management and mitigation measures are implemented.</p> |
| Non-Aboriginal heritage | <p>Construction of the project requires the demolition and replacement of two heritage items with local significance within the project site, resulting in a major impact on the fabric of the items. The project would also include minor remediation works to one heritage item, however the item would be retained as part of the project. Construction of the project has a moderate potential to impact local and state significant archaeological remains which may be present in the project site and uncovered during construction.</p> <p>The project is not expected to have any operational impact on non-Aboriginal heritage.</p> |
| Aboriginal heritage | <p>No Aboriginal places or objects were identified within the project site. Furthermore, due to the highly disturbed nature of the project site, intact archaeological deposits are not likely to be present below the ground surface. Therefore, the project is unlikely to impact any Aboriginal heritage items or places, potential Aboriginal archaeology or intangible cultural heritage values.</p> |
| Land use and property | <p>To allow for the construction and operation of the project, a number of land use and property impacts are expected, these include temporary occupation of land for site compounds, permanent property acquisitions and the removal of advertising billboards (and replacement subject to consultation with landowners and other key stakeholders). Impacts associated with land use and property would be mitigated through consultation with affected land owners and businesses.</p> |

| ISSUE | KEY POTENTIAL IMPACTS |
|--|---|
| Landscape character and visual amenity | <p>During construction there would be temporary adverse impacts on landscape character and viewpoints within the study area. This is due to several bridge replacements, the removal of trees along the southern side of the rail corridor and the location of site compounds. At night there would be minor visual impacts from lighting of the night works.</p> <p>During operation, the project would largely be absorbed into the existing visual character, due to the highly urban nature of areas to the west of the site and the reinstatement of the billboards, which largely screen views of the bridges at Robey Road and O'Riordan Street.</p> |
| Social | <p>Social benefits that may result from the construction of the project include an increase in construction related employment opportunities and potentially an increase in expenditure at local businesses. There will be reduced amenity of the local area during construction, due to the presence and operation of construction plant and equipment.</p> <p>Overall, the project is expected to result in long term benefits to local and Greater Sydney communities. These mainly relate to increased rail freight efficiency and capacity across the regional and national freight network and less congestion on the road due to reduced freight movements made by trucks.</p> |
| Risks, health and safety | <p>Adjustments or protection works would be carried out to some utilities within the project site. Any works required would be carried out with the involvement of the asset owner. Potential impacts are considered to be manageable through established mitigation and management measures.</p> <p>During construction, there may be public health and safety risks due to the proximity of sensitive receivers to the project site and nature of construction activities. This may result in traffic confusion, injury, potential exposure to contaminated land or hazardous leaks and spills, access issues, air quality impacts and noise and vibration impacts. Impacts would be managed and mitigated through the relevant site management plans.</p> <p>Where work is required that may impact Sydney Airport obstacle limitation surface, consultation will be carried out with Sydney Airport Corporation Limited to seek relevant approval exemptions and crane permits (as required).</p> <p>Once operational, the project would exceed thresholds for health effects related to environmental noise in several locations.</p> <p>Freight trains currently using the existing Botany Line protrude through the obstacle limitation surface. The project would result in an increase in the frequency of trains on the Botany Line. Consultation with Sydney Airport Corporation Limited, CASA and Airservices Australia will continue with any additional requirements relating to transient obstacles.</p> |
| Climate change | <p>No extreme climate change risks were identified in the climate risk assessment. One high risk was identified in relation to the failure of communications and signalling systems caused by flooding, as a result of an increase in rainfall intensity combined with sea level rise. This risk would be minimised through design.</p> |

24.2 Approach to environmental management

The approach to environmental mitigation and management for the project involves:

- project design – as described in section 6.1.2 and 7.1.1, the project incorporates measures to avoid and minimise impacts through ongoing detailed design
- environmental performance outcomes – the intended outcomes are outlined in section 24.3
- mitigation measures – the measures provided in Chapters 8 to 23 are identified as an outcome of the environmental impact assessment and are consolidated in section 24.3.

A number of actions and documents will inform the detailed construction and operational planning and methodologies. They will aim to capture and reflect the measures listed above with the aim to minimise and mitigate potential impacts. They include:

Independent Environmental Representative (ER) – engagement of a suitably qualified and experienced ER who is independent from the design and construction personnel for the project and those involved in the delivery of it. The ER would:

- review the Site Environmental Management Plan (EMP) for enabling works and the Construction Environmental Management Plan (CEMP) (and associated sub-plans) for the main construction works
- consider and recommend to ARTC any improvements that may be made to work practices to avoid or minimise adverse impacts on the environment and the community
- receive and respond to communication from the Secretary of the Department of Planning, Industry and Environment in relation to the environmental performance of the project separate to the Proponent.

Community and stakeholder engagement plan – This would aim to detail the approach to communication between ARTC and its Construction Contractors, the community and government authorities. It would consider the results of consultation throughout the Planning Approval process as well as capture the relevant measures identified within this EIS. This is discussed further in section 24.2.1.

ARTC's Site EMPs for enabling works – ARTC's existing Site EMP template will be used to develop site or activity specific EMPs for enabling works. The EMPs will aim to guide the approach to environmental management during the enabling works, as described in section 24.2.2. The Site EMPs would:

- detail how the mitigation measures identified in this EIS relevant to the enabling works would be implemented throughout works
- show (using a graphical tool) where environmental controls will be located and how they will be used
- document processes for environmental monitoring to demonstrate compliance
- be reviewed and approved by the independent ER prior to commencement of the relevant enabling works
- be the primary management plan for works prior to the finalisation and approval of the CEMP. Following CEMP approval, all works would be undertaken in accordance with the CEMP.

Project specific CEMP – prepared to guide the approach to environmental management during the main construction works, as described in section 24.2.3. The CEMP would:

- outline the environmental management practices and procedures to be followed
- detail how the mitigation measures and performance outcomes would be implemented and achieved during construction
- document processes for demonstrating compliance with the commitments made in this EIS, the submissions/preferred infrastructure report (to be prepared) and relevant approval conditions
- be prepared in consultation with relevant agencies and in accordance with the *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004b).

ARTC's environmental management system – Noting that the project includes duplication of three kilometres of an existing operational line, ARTC's existing environmental management system is a structured framework for the management of the operational rail corridor, which includes over 8000 kilometres of rail network Australia-wide. The management system manages the evaluation, regulatory compliance and reporting of environmental issues associated with ARTC's operational and maintenance activities. The environmental management system supports ARTC's environment policy and outlines processes to guide compliance with environmental laws, statutes, regulations and corporate policies while managing potential environmental impacts.

The principal benefits of operating the ARTC environmental management system is that it provides clear definition of the corporate environmental goals, documented policies and procedures to:

- prevent or minimise environmental damage
- achieve legal compliance
- improve management of environmental risks
- document roles and responsibilities
- improve community relationships.

Given that no new impacts are introduced as a result of the project, operation of the Botany Rail Duplication project would be managed under ARTC's environmental management system. This accommodates relevant management measures to the operation phase identified in this EIS.

ARTC's Safety Management System – As an accredited rail transport operator ARTC is required by rail safety legislation to have in place a Safety Management System (SMS) that covers the railway operations it is accredited to carry out. The SMS holds information on how ARTC maintains safe operations. This information is documented in policies, procedures, standards, work instructions, guidelines etc. The ARTC SMS is an integrated system which incorporates requirements of Work Health & Safety legislation and is adopted by ARTC's staff and contractors. Alongside the Environmental Management System, it manages the safety and environmental risks associated with operating and maintaining ARTC infrastructure.

The Asset Management System forms part of the SMS. It includes provision for planning for capital and major periodic maintenance as well as routine, corrective and reactive maintenance. The system is supported by a tool which notifies, tracks and evaluates against a long term asset management program.

The SMS applies to ARTC's Australia wide network and as such, a range of potential environmental risks throughout operation are monitored through application of this and the Environmental Management System.

Figure 24.1 shows the interaction of the management plans and the key stages of the project.

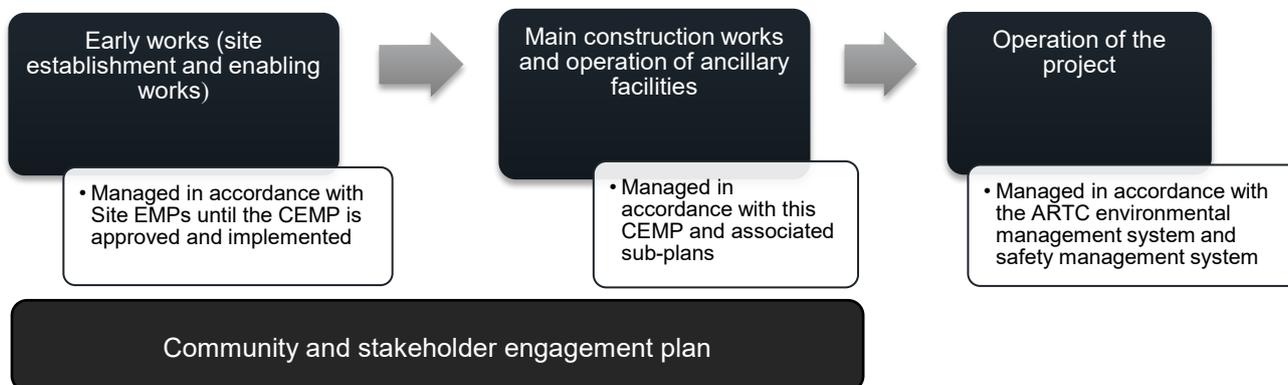


Figure 24.1 Approach to environmental management

24.2.1 Community and stakeholder engagement plan

A community and stakeholder engagement plan would be prepared prior to commencement of the enabling works. The plan would be developed in consultation with Bayside Council. The plan would aim to detail the approach to communicate between ARTC, its Construction Contractors, the community and government authorities. The community and stakeholder engagement plan would:

- identify people, organisations and government authorities to be consulted during the works
- set out procedures and mechanisms for the regular distribution of accessible information to keep the community and stakeholders informed in accordance with the measures outlined in this EIS

- set out the procedures and mechanisms for consulting with relevant councils and government authorities including procedures for nil responses
- describe the method for advertising the 24 hour response line and email address for enquiries
- set out procedures and mechanisms for response to enquiries and feedback
- include a complaints management system which outlines parameters for recording information on all complaints received during main construction work
- set out procedures and mechanisms to resolve any issues and disputes that might arise in relation to environmental management associated with the project.

24.2.2 Site EMPs

A description of the enabling works for the project is provided in section 7.2.1. The Site EMPs for enabling works would include:

- key project information relevant to the relevant enabling works being undertaken including:
 - a description of the relevant activities as per the approved EIS
 - timeframes and hours of work for the tasks being undertaken (including any out of hours works and restriction on high noise-generating activities)
 - contact details for key project personnel (including after hours) and community response line (Enviroline) contact number
- a site plan with a north point, legend and scale that shows:
 - the worksite layout and boundary, including entry/exit points, internal and adjacent roads, adjoining land use and nearest noise sensitive receivers
 - contours/elevation points and/or direction of slope/s
 - existing major services that may be in conflict or high risk
- key environmental risk issues and the specific mitigation measures that apply to the enabling works as identified in the EIS including:
 - location and type of sediment and erosion control measures
 - dust control measures
 - location of monitoring equipment (eg dust, noise, vibration monitors) and frequency of monitoring/inspections
 - location of environmentally sensitive areas (eg threatened species, critical habitat, contaminated areas, heritage zones)
 - location of the construction compounds, materials storage and laydown areas, waste management facilities and worker car parking (including any parking restrictions)
 - vegetation and trees to be protected or removed, with any actions required prior to felling
 - location of known heritage (Aboriginal or non-Aboriginal) items
 - location of spill containment and clean-up equipment
 - location of stormwater drainage and watercourses leading to or from the worksite
 - document control and approval details.

The Site EMPs would be reviewed and approved by the independent Environmental Representative. They would be reviewed regularly, in response to changes such as activities and environmental conditions, to ensure ongoing environmental management. The Site EMPs would be used in project inductions and tool box talks and be placed in central locations for reference by all project personnel.

24.2.3 CEMP

Developed prior to commencement of the main construction works, the CEMP would include:

- ARTC's environmental policy, objectives and performance targets for construction
- relevant sub-plans as specified by the mitigation measures provided in Chapters 8 to 22
- reference to all relevant statutory and other obligations, including consents, licences, approvals and voluntary agreements required
- management policies, procedures and review processes to assess the implementation of environmental management practices and the environmental performance of the project against the objective and targets
- requirements and guidelines for management in accordance with:
 - the conditions of approval for the project
 - the mitigation measures specified in this EIS
 - relevant construction management guidelines (including those provided in Chapters 8 to 22)
- requirements in relation to incorporating environmental protection measures and instructions in all relevant standard operating procedures and emergency response procedures
- roles and responsibilities of all personnel and contractors to be employed on site
- incident and contingency management procedures
- procedures for complaints handling and ongoing communication with the community
- a monitoring and auditing program, as defined by this EIS.

The CEMP would be adaptive, establishing a continuous cycle of monitoring, assessment, investigation and corrective actions. This process would be used to continuously evaluate and monitor the effectiveness of the environmental management measures proposed in this EIS and identify the corrective actions to be carried out should such measures be identified as being ineffective.

Compliance monitoring would be undertaken in the form of audits, including site audits as undertaken by ARTC and the ER. Frequency and reporting parameters would be identified in the CEMP.

Prior to commencement of main construction works, a compliance tracking and reporting program would be developed as part of the CEMP and implemented by the Construction Contractors. It would aim to monitor compliance with this EIS, relevant conditions of approval, licences and permits.

24.3 Compilation of mitigation measures

Table 24.2 provides a compilation of the measures proposed to mitigate and manage the potential impacts of the project, as detailed in Part C. The measures listed may be revised in response to submissions raised during public exhibition of the EIS or any design changes made following exhibition. The final list of mitigation measures would be provided in the submissions/preferred infrastructure report.

If the project is approved, the project would be undertaken in accordance with the conditions of approval and the final list of mitigation measures.

Table 24.2 Compilation of mitigation measures during design

| REF | TOPIC | IMPACT | MEASURES |
|------|---------------------|---|---|
| DNV1 | Noise and vibration | Sleep disturbance from consecutive night-time works | <p>The need for consecutive night-time works and likelihood for sleep disturbance impacts will be reviewed during detailed design. Where impacts are considered likely, appropriate noise mitigation will be developed which takes into consideration factors such as the existing facade performance of affected residential receivers.</p> <p>Appropriate respite will be provided to affected receivers to limit impacts from night-time works in the same location, as required by the conditions of approval.</p> |
| DNV2 | Noise and vibration | Potential noise impacts on hotels | <p>Further investigation will be completed during detailed design to determine appropriate criteria which take into account the existing facade performance of the affected hotels, noting that most of the hotels are of recent construction and are likely to have high performance facades.</p> <p>Prior to construction, all hotels within 50 metres of the project site will be consulted and assessed to determine their sensitivity to airborne and ground-borne noise impacts, existing facade performance, areas of permanent residence (if any) and to allow appropriate criteria and mitigation to be determined.</p> |
| DNV3 | Noise and vibration | Potential vibration impacts on pipeline assets | <p>The project has the potential to impact a number of pipeline assets during construction. An assessment will be completed in detailed design which will:</p> <ul style="list-style-type: none"> • calculate the actual distance of the works from the structure • assess ground conditions and the effect this will have on vibration. <p>Where impacts are considered likely, the susceptibility of the various assets to vibration levels and appropriate monitoring and management protocols will be developed in consultation with the relevant owners. Condition surveys will be completed before and after the works where appropriate.</p> |
| DNV4 | Noise and vibration | Noise impacts on the community | <p>In locations where 'moderate' or 'high' noise impacts are predicted, engagement with the affected communities will be outlined in the community and stakeholder engagement plan and undertaken during detailed design to determine their preference for mitigation and management measures.</p> |

| REF | TOPIC | IMPACT | MEASURES |
|------|------------------------|--|--|
| DNV5 | Noise and vibration | Operational noise impacts | <p>Investigate operational noise and vibration mitigation options during detailed design, including source control measures, path control measures and receiver controls as per the RING.</p> <p>This will include a review of the:</p> <ul style="list-style-type: none"> • use of track lubrication as the primary source of noise control for operation noise impacts • feasibility and reasonableness of using noise barriers to provide path control mitigation to nearby receivers, noting the specific constraints that are applicable to this project • need for at-property treatment to be used to mitigate residual impacts at receivers which require consideration of mitigation after the use of source of path control measures. <p>The potential operational noise and vibration mitigation options to be investigated are discussed further in section 8.3 in <i>Technical Report 2 – Noise and Vibration Impact Assessment</i>.</p> |
| DNV6 | Noise and vibration | Operational ground-borne noise impacts | <p>Potential ground-borne noise impacts will be investigated further during detailed design when the extent of airborne rail noise mitigation, train speeds, and the position of track turnouts is confirmed.</p> |
| DFL1 | Hydrology and flooding | Rail duplication | <p>As a minimum, the modification and duplication of the existing rail line is to be configured to ensure the existing level of flood immunity is not reduced by the project.</p> <p>Measures to improve the existing level of flood immunity are to be further investigated during detailed design with the goal of providing a 1% annual exceedance probability (AEP) level of flood immunity.</p> |
| DFL2 | Hydrology and flooding | New bridge over Mill Stream | <p>The new bridge crossing over Mill Stream is to provide a minimum freeboard of 0.5 metres between the underside of the bridge structure and the peak 1% AEP flood level.</p> |
| DFL3 | Hydrology and flooding | System and control network | <p>Rail location cabinets (LOCs) for housing communications, power and signalling equipment for the system and control network will be located a minimum 0.5 metres above the peak 1% AEP flood level in accordance with ARTC standards.</p> |
| DFL4 | Hydrology and flooding | New corridor access roads | <p>A 10% AEP level of flood immunity is to be provided to the new access roads.</p> |

| REF | TOPIC | IMPACT | MEASURES |
|------|-------------------------|--|--|
| DFL5 | Hydrology and flooding | Management of adverse flood impacts on the existing environment (design) | <p>A detailed hydrologic and hydraulic (flood) assessment of the impacts of the project on flood behaviour and the associated measures which are required to mitigate those impacts will be undertaken during detailed design.</p> <p>Works within the floodplain will be designed to minimise adverse impacts on surrounding development (including roads) for flooding up to the 1% AEP event in magnitude. Assessment will also be made of impacts during floods up to the probable maximum flood (PMF) in the context of impacts on critical infrastructure and flood hazards.</p> <p>Subject to the flood assessment during detailed design, it may be necessary to collect detailed ground survey (including floor levels and entry levels to buildings and basement carparks) in affected areas to determine whether the project will increase flood damages in adjacent development (ie in properties where there is a potential for increases in peak flood levels for events up to 1% AEP in magnitude) or increase the flood hazard to basement carparks (ie in basement carparks where there is a potential for increases in the frequency, rate and volume of flow into basement carparks for events up to the PMF).</p> <p>The design of the project will need to incorporate measures that are aimed at mitigating the impact of the project on flood behaviour in properties where existing buildings will experience above-floor inundation during floods up to the 1% AEP event, or where there is the ingress of floodwater to basement carparks during storms up to the PMF. Drainage structures will be sized and positioned more precisely during detailed design to mitigate these impacts.</p> <p>Localised increases in flow velocities at the outlets to upgraded or relocated, or new stormwater drainage systems will be mitigated through the provision of scour protection and energy dissipation measures</p> |
| DWQ1 | Water quality and soils | Formation failure | The formations and integrated drainage will be designed to prevent formation failure. This will include designing the longitudinal drainage to direct surface water runoff away from formations. |
| DWQ2 | Water quality and soils | Soil erosion | Batter slope gradients, surface treatments and the construction program will be designed to minimise erosion risk so the annual sediment export rate is below 150 m ³ at each outlet to avoid the need for sediment basins in accordance with the Blue Book. |
| DWQ3 | Water quality and soils | Use of water during construction | Requirements for construction water (volumes, quality, demand curves, approvals requirements and lead times) will be defined during detailed design. |
| DWQ4 | Water quality and soils | Potential scour and erosion impacts | Suitably designed scour and erosion control measures will be included in the detailed design where required, including at the Mill Stream drainage outlets. |
| DWQ5 | Water quality and soils | Potential scour and erosion impacts | The detailed design of Mill Stream bridge will be optimised to minimise upstream or downstream scour effects on the existing watercourse. |

| REF | TOPIC | IMPACT | MEASURES |
|------|-------------------------|-------------------------------|--|
| DWQ6 | Water quality and soils | Groundwater impacts | A baseline groundwater monitoring program will be implemented to characterise baseline groundwater conditions as per Chapter 8 of <i>Technical Report 7 – Groundwater Impact Assessment</i> . |
| DNH1 | Non-Aboriginal heritage | Avoidance of heritage impacts | Impacts to significant fabric, locally and State significant archaeological remains and landscapes (including trees, plantings and public recreation areas) within and adjacent to the project site will be avoided, where possible. Designs will also endeavour to reduce visual impacts by considering sympathetic and unobtrusive fabric, colour, form and size for new built elements. Appropriate impact avoidance measures will be considered during the detailed design phase and included in the Construction Environment Management Plan (CEMP) for the project where required. |
| DNH2 | Non-Aboriginal heritage | Heritage Interpretation | <p>A Heritage Interpretation Plan (HIP) including a heritage interpretation strategy will be prepared in accordance with the <i>NSW Heritage Manual</i>, the <i>NSW Heritage Office’s Interpreting Heritage Places and Items: Guidelines</i> (NSW Heritage Office, 2005), and the <i>NSW Heritage Council’s Heritage Interpretation Policy</i> (Heritage Council of NSW, 2005).</p> <p>The HIP will focus on the study areas historic development and target items considered to contain heritage significance within the project site including:</p> <ul style="list-style-type: none"> • Mascot (Botany Road) Underbridge • Mascot (O’Riordan Street) Underbridge • Mascot (Robey Street) Underbridge • Botany Rail Line and its associations with the development of industry and land use in the Botany and Mascot areas. <p>The HIP will be prepared in consultation with:</p> <ul style="list-style-type: none"> • Bayside Council • NSW Heritage Council • Randwick and District Historical Society. |
| DLP1 | Land use and property | Property acquisition | The overall disturbance footprint will continue to be refined during detailed design to identify areas where it could be minimised to reduce impacts on existing land uses. Detailed staging of the project will also be determined during detailed design and will aim to minimise the time that affected land uses are impacted during construction. |
| DLP2 | Land use and property | Property acquisition | The relevant property owners will be consulted in relation to the acquisition of properties required to facilitate the project. All acquisitions required for the project will be carried out in accordance with the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and the land acquisition reforms announced by the NSW Government in 2016. |

| REF | TOPIC | IMPACT | MEASURES |
|------|--|---|--|
| DLP3 | Land use and property | Establishment of compound sites within private property | Temporary occupation of required site compounds will be negotiated under legal agreement with property owners. On completion of the project, the land will be returned to the owners for continued future use. |
| DLP4 | Land use and property | Billboard modification/ relocation | The overall disturbance footprint will be refined during detailed design to identify areas where the footprint could be minimised to reduce impacts on billboards and to minimise modification or relocation where possible. |
| DLV1 | Landscape character and visual amenity | Landscape character and visual impact of proposed retaining walls | Proposed retaining wall finishes will be selected to align with the projects urban design and landscaping principles and aim to minimise adverse visual impact. These treatments will be aligned with the urban design concepts of the Sydney Gateway road project between O’Riordan and Robey Streets. |
| DLV2 | Landscape character and visual amenity | Landscape character and visual impact of proposed bridges | The proposed twin bridges at Robey and O’Riordan Streets and Southern Cross Drive will be designed to minimise visual clutter. All bridges will incorporate measures to discourage graffiti. |
| DLV3 | Landscape character and visual amenity | Landscape impact from relocation of Billboards | As a priority, billboards will be replaced like for like. Where they cannot be replaced like for like they will be shifted in space to allow like for like placement on a new location in immediate vicinity of their current location. Where they cannot be placed in their immediate vicinity, they will be relocated along the existing rail corridor and combined with existing structures (such as bridges) where practicable in order to minimise potential to introduce structures in areas where there are minimal structures and infrastructure (ie clustering instead of introducing impacts on higher sensitivity areas). |
| DRW1 | Resources and waste | Spoil generation | Measures to minimise excess spoil generation will be investigated at detailed design. This will include a focus on optimising the design to minimise spoil volumes and the reuse of material on-site. |
| DHS1 | Risks, health and safety | High pressure flammable material released from pipeline | Independently facilitated AS 2885.6 SMS workshops will be completed with each high pressure pipeline owner and the construction contractor. The SMS workshops will be conducted once design has reached a level that enables completion of a compliant AS 2885.6 process. This level is considered to be detailed design and will be completed before construction relating to the relevant utilities commence. |
| DHS2 | Risks, health and safety | Disruption of utility services | The location of key utility infrastructure which relate to the project site and proposed construction works will be identified and documented in the relevant design drawings and reports, prior to construction works commencing. |
| DHS3 | Risks, health and safety | Disruption of utility services | Details of proposed works for key utilities, such as relocate or protect will be confirmed prior to construction works commencing. |

| REF | TOPIC | IMPACT | MEASURES |
|------|--------------------------|---|---|
| DHS4 | Risks, health and safety | Wind shear and turbulence due to new constructions in the vicinity of the airport | Based on the current design, detailed windshear assessment is not warranted. Consultation with Sydney Airport Corporation Limited is required to confirm any need for detailed assessment in accordance with <i>National Airports Safeguarding Framework Guideline B</i> during detailed design. |
| DHS5 | Risks, health and safety | Light glare distracting and confusing Sydney Airport aircraft pilots | Lighting associated with operation and maintenance of the rail line, including train headlights, will comply with CASA Manual of Standards 139 section 9.21 and National Airports Safeguarding Framework Guideline E. |
| DHS6 | Risks, health and safety | Rail and train heights infringing the Sydney Airport obstacle limitation surface | The rail alignment has been designed in conjunction with the protected airspace associated with Sydney Airport to minimise the intrusions into the airspace. Consultation with Sydney Airport Corporation Limited will be undertaken during detailed design on the final rail alignments and heights. Consultation with Airservices Australia will be undertaken during detailed design for assessment of any required updates to the ERSA. |
| DHS7 | Risks, health and safety | Wildlife strikes to Sydney Airport aircraft due to increased wildlife activity in the vicinity of the airport | Drainage and revegetation has been designed so as not to create high risk environments for attracting additional wildlife. Any changes to the drainage or revegetation design made during detailed design will ensure that no high risk environments for attracting additional wildlife are created. |
| DHS8 | Risks, health and safety | Cumulative impacts on utility services (Sydney Gateway road project) | Co-ordination of utility relocations will be considered before enabling works commence. |

| REF | TOPIC | IMPACT | MEASURES |
|------|----------------|--|--|
| DCC1 | Climate change | Climate change resulting in a range of potential impacts on the asset that can be mitigated through design | <p>Measures to mitigate any extreme, high and medium climate change risks will be further refined and included in the detailed design to ensure there are no residual extreme or high climate risks, and minimise medium risks where practicable. The following potential measures will be considered:</p> <ul style="list-style-type: none"> • designing drainage systems to consider the increase in rainfall intensity due to climate change • locating new rail systems infrastructure above predicted climate change flood levels, where practicable • placing cable routes outside climate change flood inundation zones where feasible • adjusting the neutral point when specifications are prepared for the stressing of steel rail to account for likely temperature variations and increases in average maximum temperatures • selecting equipment that is resilient to the projected temperature changes over its design life • designing ventilation systems for signalling equipment rooms/location cases to account for increased temperatures due to climate change • connecting to existing system at the site where UPS changeovers are provided to bridge power supply when changing from electricity network to critical infrastructure back-up supply to reduce risk of power failure • limiting outside exposure of cables where possible, ensure the installation of surge protection and provide a redundant power source to reduce likelihood and impacts of lightning strikes to exposed cables • reducing the number of signalling cabinets to reduce the amount of exposed cabling. |

Table 24.3 Compilation of mitigation measures during construction

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-----------------------|--|--|----------------|-------------------|
| CTT1 | Traffic and transport | General management of traffic during the project | <p>Implementation of Construction Transport, Traffic and Access Management Plan (CTTAMP) for the main construction works. As a minimum, the CTTAMP will include:</p> <ul style="list-style-type: none"> • identification of haulage routes • notification and consultation strategy with public and relevant authorities/stakeholders • special event and emergency services management • parking restrictions • protocol for monitoring cumulative traffic impact. <p>The CTTAMP will also consider cumulative construction impacts and define a suitable management approach.</p> <p>The CTTAMP will not be created for enabling works, however the relevant mitigation measures will form part of the site EMPs.</p> | | ✓ |
| CTT2 | Traffic and transport | Localised vehicular, pedestrian, cyclists and public transport management around site accesses | <p>Provide suitably designed construction site access which will consider:</p> <ul style="list-style-type: none"> • road design guidelines • visible temporary regulatory, warning and guide signs • use of accredited traffic controllers where appropriate • provision of deceleration lanes at accesses abutting highly trafficked roads. | ✓ | ✓ |
| CTT3 | Traffic and transport | Increased heavy vehicles in the road network | <ul style="list-style-type: none"> • Administrative controls to limit truck activities during peak periods. • Implement radio communication and designated truck idling areas to minimise impact of truck queuing on public roads. • Temporary traffic controls. | ✓ | ✓ |
| CTT4 | Traffic and transport | On-street parking management | <ul style="list-style-type: none"> • Maximise parking at each site and compound. • Encourage carpooling/cycling/public transport. • Providing shuttle buses between off-site parking locations. • Providing shuttle buses between the two main on-site compounds and smaller construction compounds. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-----------------------|--|--|----------------|-------------------|
| CTT5 | Traffic and transport | Public transport services travel time | <ul style="list-style-type: none"> • Consultation with service providers to develop alternative service arrangements. • Notification to the general public prior to implementation of service changes. • Changes to services during possessions. | | ✓ |
| CTT6 | Traffic and transport | Active transport facility closures and diversions | <ul style="list-style-type: none"> • Ensure appropriate detours such as maintaining access on at-least one side of the road. • Provide safe access across site gates. | | ✓ |
| CTT7 | Traffic and transport | <p>Reduced accessibility on the road network.</p> <p>Detour can result in increased travel time.</p> | <ul style="list-style-type: none"> • Manage closures during off-peak periods. • Select a bus detour route that will minimise impact on punctuality of bus services and minimise public transport accessibility impact on the community. • Implement suitable traffic management during closures to manage and guide motorists at the approaches and through or around the work sites. • Public information campaigns. • Truck travel time management. | | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|---------------------|---|---|----------------|-------------------|
| CNV1 | Noise and vibration | Noise generated from enabling activities including billboard removal, utilities relocation and vegetation clearing and property adjustments | <p>Site EMPs will be prepared before any enabling works begin. Specific to the activities proposed, these plans will include:</p> <ul style="list-style-type: none"> • identification of nearby sensitive receivers • description of works, construction equipment and hours of work • mitigation measures that apply to the works proposed • criteria for the project and relevant licence and approval conditions • requirements for noise and vibration monitoring • details of how community consultation will be completed in accordance with the community and stakeholder engagement plan • details of how respite will be applied where ongoing high impacts are seen at certain receivers. <p>The requirement for enabling works out of hours will be described in the site EMPs to be approved by the independent Environmental Representative (ER). The Site EMPs will detail:</p> <ul style="list-style-type: none"> • the proposed activities and predict the potential noise impact against the relevant noise and vibration criteria • the relevant mitigation measures, including consideration of sleep disturbance and respite periods • the required community notification specific to the activities proposed. | ✓ | |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|---------------------|---|--|----------------|-------------------|
| CNV2 | Noise and vibration | Noise generated from main construction activities | <p>A CNVMP will be prepared as a sub plan to the CEMP before any main construction works begin. This will include:</p> <ul style="list-style-type: none"> • identification of nearby sensitive receivers • description of works, construction equipment and hours of work • criteria for the project and relevant licence and approval conditions • requirements for noise and vibration monitoring • details of how community consultation and notification will be completed • procedures for handling complaints • details on how respite will be applied where ongoing high impacts are seen at certain receivers. <p>The CNVMP will also consider cumulative construction impacts and the likelihood for 'construction fatigue' from consecutive projects in the area and define a suitable management approach. Quantitative road traffic noise impacts from temporary detours during construction would also be evaluated, especially for local roads with low existing volumes.</p> | | ✓ |
| CNV3 | Noise and vibration | Noise generated from main construction activities | Community consultation measures will be included in the CNVMP and community and stakeholder engagement plan, including periodic notification (monthly letterbox drop or equivalent) detailing all upcoming construction activities delivered to impacted sensitive receivers at least 14 days prior to commencement of relevant works. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|---------------------|---|---|----------------|-------------------|
| CNV4 | Noise and vibration | Noise generated from out-of-hours work | <p>Unless subject to an Environment Protection License, an Out-of-Hours Work Protocol will be prepared and included as part of the CNVMP for main construction works. It will identify a process for the consideration, management and approval of works which are outside standard hours. The protocol will be prepared in consultation with the EPA and approved by the independent ER before the commencement of main construction works. The protocol will include processes for:</p> <ul style="list-style-type: none"> the consideration of out of hours work against the relevant noise and vibration criteria the identification of mitigation measures for residual impacts, including respite periods in consultation with the community at affected locations consideration of the risk of activities, proposed mitigation, management and coordination for works outside of standard hours to be approved by the independent ER. | | ✓ |
| CNV5 | Noise and vibration | Noise generated from out-of-hours work | Where feasible and reasonable, construction will be carried out during Standard Construction Hours. If it is not possible to restrict the works to daytime, then they will be scheduled so noise intensive equipment is not used after 11:00 pm, where possible, noting that there is a requirement for many of the works to be completed during possessions, and restrictions on working hours during these periods are generally not feasible. | ✓ | ✓ |
| CNV6 | Noise and vibration | Noise generated from use of noise intensive equipment | Where noise intensive equipment is to be used near sensitive receivers, the works will be scheduled for Standard Construction Hours, where possible. If it is not possible to restrict the works to daytime then they will be scheduled so noise intensive equipment is not used after 11:00 pm, where feasible. | ✓ | ✓ |
| CNV7 | Noise and vibration | Noise generated from use of noise intensive equipment | Monitoring will be carried out at the start of noise and vibration intensive activities which are near to receivers to confirm that actual levels are consistent with the predictions. Where mitigation measures have been specified, the monitoring results should confirm their effectiveness. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|---------------------|---|--|----------------|-------------------|
| CNV8 | Noise and vibration | Use of construction compounds | Hoardings, or other shielding structures, will be used where receivers are near compounds or worksites with long-term works. To provide effective noise mitigation, the hoarding will break the line of sight from the nearest receivers to the works, where possible, and be of solid construction with minimal gaps. Hoarding for construction sites is typically around three metres in height. | | ✓ |
| CNV9 | Noise and vibration | Use of construction compounds | Noise generating activities in compounds will be positioned away from receivers where possible. Items such as sheds can also be used to shield receivers from noise generated in other parts of the compound. | | ✓ |
| CNV10 | Noise and vibration | Use of construction compounds | Noise impacts are predicted for the compound between Banksia Street and Stephen Road due to the proximity of the nearest receivers. The use of this compound site during out of hours works associated with the road closures at Robey Street and O’Riordan Street will be avoided as far as practicable. | ✓ | ✓ |
| CNV11 | Noise and vibration | Vibration impacts from use of vibration intensive equipment | Where works are required within the minimum working distances and considered likely to exceed the cosmetic damage criteria: <ul style="list-style-type: none"> different construction methods with lower source vibration levels will be investigated and implemented, where feasible attended vibration measurements will be undertaken at the start of the works to determine actual vibration levels at the item. Works will be ceased if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria. | ✓ | ✓ |
| CNV12 | Noise and vibration | Vibration impacts from use of vibration intensive equipment | Building condition surveys will be completed before and after the works where buildings or structures, including heritage items, are within the minimum working distances and considered likely to exceed the cosmetic damage criteria during the use of vibration intensive equipment. Appropriate criteria will be confirmed for each item before the works begin, based on the surveys. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|---------------------|---|---|----------------|-------------------|
| CNV13 | Noise and vibration | Vibration impacts from use of vibration intensive equipment | The potential human comfort impacts and requirement for vibration intensive works will be reviewed as the project progresses. Where receivers are within the human comfort minimum working distances, the impacts will be managed with the procedures defined in the CNVMP. | ✓ | ✓ |
| CNV14 | Noise and vibration | Vibration impacts from use of vibration intensive equipment | <p>The requirement for vibration intensive works near heritage items will be reviewed during detailed construction planning. Where heritage items are considered potentially sensitive to vibration impacts, the more stringent DIN 4150 Group 3 guideline values will be applied and monitoring will be completed when vibration intensive works are in close proximity.</p> <p>Condition surveys will be completed before and after the works where heritage items are within the minimum working distances and considered likely to exceed the cosmetic damage criteria.</p> | ✓ | ✓ |
| CNV15 | Noise and vibration | Cumulative construction noise impacts | <p>The likelihood of cumulative or consecutive construction noise impacts will be reviewed during detailed design when detailed construction schedules are available. Coordination will occur between the various projects to minimise concurrent works (particularly concurrent out of hours work) in the same areas, where possible.</p> <p>Specific additional management and mitigation measures designed to address potential consecutive impacts will be developed and used to minimise the impacts as far as practicable, in consultation with the affected community.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|---------------------|---|---|----------------|-------------------|
| CNV16 | Noise and vibration | Noise generated from construction workers | <p>All employees, contractors and subcontractors will receive an environmental induction. The induction must at least include:</p> <ul style="list-style-type: none"> • all relevant project specific and standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on noise generating activities with special audible characteristics • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures. | ✓ | ✓ |
| CNV17 | Noise and vibration | Noise generated from construction workers | <p>No swearing or unnecessary shouting or loud stereos/radios/phone calls on speaker on site.</p> <p>No dropping of materials from height, throwing of metal items and slamming of doors.</p> <p>No unnecessary idling of vehicles near to receivers.</p> | ✓ | ✓ |
| CNV18 | Noise and vibration | General construction noise generation | <p>Use quieter and less vibration emitting construction methods where feasible and reasonable.</p> <p>For example, when piling is required, bored pile rather than impact-driven piles will minimise noise and vibration impacts.</p> | ✓ | ✓ |
| CNV19 | Noise and vibration | General construction noise generation | <p>Simultaneous operation of noisy plant within discernible range of a sensitive receiver will be avoided.</p> <p>The offset distance between noisy plant and adjacent sensitive receivers will be maximised.</p> <p>Plant used intermittently will be throttled down or shut down.</p> <p>Noise-emitting plant will be directed away from sensitive receivers, where possible.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|---------------------|---------------------------------------|--|----------------|-------------------|
| CNV20 | Noise and vibration | General construction noise generation | Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. | ✓ | ✓ |
| CNV21 | Noise and vibration | General construction noise generation | Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site as well as any out of hours work. | ✓ | ✓ |
| CNV22 | Noise and vibration | General construction noise generation | <p>Loading and unloading of materials/deliveries will occur as far as possible from sensitive receivers.</p> <p>Site access points and roads will be selected as far as possible away from sensitive receivers.</p> <p>Dedicated loading/unloading areas will be shielded if close to sensitive receivers.</p> | ✓ | ✓ |
| CNV23 | Noise and vibration | General construction noise generation | <p>Where possible, noise from mobile plant will be reduced through additional:</p> <ul style="list-style-type: none"> • residential grade mufflers • damped hammers such as 'City' Model Rammer Hammers • Air Parking brake engagement is silenced. | ✓ | ✓ |
| CNV24 | Noise and vibration | General construction noise generation | <p>Stationary noise sources will be enclosed or shielded while ensuring that the occupational health and safety of workers is maintained.</p> <p>Appendix F of AS 2436: 1981 lists materials suitable for shielding.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|---------------------|---------------------------------------|---|----------------|-------------------|
| CNV25 | Noise and vibration | General construction noise generation | <p>A CTTAMP will be prepared for the project to manage the haul routes and vehicle movements.</p> <p>Where construction routes are along local roads there is potential for impacts at the adjacent residential receivers, depending on the volume of construction traffic. The potential impacts will be managed using the following approaches:</p> <ul style="list-style-type: none"> • vehicle movements will be away from sensitive receivers and during less sensitive times, where possible • the speed of vehicles will be limited and will avoid the use of engine compression brakes • on-site storage capacity will be maximised to reduce the need for truck movements during sensitive times • heavy vehicles will be restricted from idling near residential receivers. | | ✓ |
| CNV26 | Noise and vibration | General construction noise generation | Structures, such as site sheds, will be used to shield residential receivers from noise (where practicable), noting that upper floors of multi-storey buildings will be unlikely to benefit. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|---------------------|---|--|----------------|-------------------|
| CNV27 | Noise and vibration | Detours during construction | <p>The assessment indicates there is potential for noticeable increases in road traffic noise for some receivers along the detours routes, such as Robey Street. Detours using this road are planned for up to 10 weekends (for closures to either Robey Street or O’Riordan Street) during construction of the project.</p> <p>The potential impacts would be reviewed as the project progresses using detailed traffic volume data. Where residential receivers are expected to be subject to a >2.0 dB night-time increase during detours, the project would:</p> <ul style="list-style-type: none"> consider the use of different detour routes that do not put traffic during the night-time on roads with low existing volumes. <p>Where this is not possible, the project would:</p> <ul style="list-style-type: none"> apply appropriate mitigation measures to the affected residential receivers, as agreed with the independent Environmental Representative (ER), based on the expected magnitude of the exceedance and the total duration of night-time impacts from all detours during construction of the project. | ✓ | ✓ |
| CAQ1 | Air quality | Minor and temporary elevated particulate matter (PM ₁₀) at receptors within six metres of the construction boundary | <p>Dust suppression will be undertaken as required using water sprays, water carts or other media on:</p> <ul style="list-style-type: none"> unpaved work areas subject to traffic or wind sand, spoil and aggregate stockpiles during the loading and unloading of dust generating materials. <p>As a minimum, level 1 watering should be undertaken on general construction areas and level 2 watering should be undertaken on heavy construction areas. Further discussion including a description of construction work classification is provided in section 5.2 of <i>Technical Report 3 – Air Quality Impact Assessment</i>.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-------------|---|--|----------------|-------------------|
| CAQ2 | Air quality | Minor and temporary elevated particulate matter (PM ₁₀) at receptors within six metres of the construction boundary | <p>Visual dust monitoring will be performed on a routine basis, and all staff will be trained to look out for visible dust leaving the worksite in the direction of sensitive receptors.</p> <p>If the works are creating visible dust plumes, the works will be modified or stopped until the dust hazard is reduced to an acceptable level.</p> <p>If complaints are received relating to dust from construction works, works will be reviewed to identify opportunities to reduce potential impacts from dust.</p> <p>In the instance of ongoing dust issues, or complaints, a short term dust monitoring device will be installed in the relevant area which may be adjacent to a sensitive receptor near any longer term construction area.</p> | ✓ | ✓ |
| CAQ3 | Air quality | Dust from construction vehicles | Construction vehicles with potential for loss of loads (such as dust or litter) will be covered when using public roads. | ✓ | ✓ |
| CAQ4 | Air quality | Emissions from construction equipment and plant | Plant and equipment will be maintained in good condition to minimise spills and air emissions that may cause air quality impacts. | ✓ | ✓ |
| CAQ5 | Air quality | Dust from stockpiles | The size of stockpiles will be minimised where possible and located as far as practicable from sensitive receptors. | ✓ | ✓ |
| CAQ6 | Air quality | Contaminated dust with PFAS may become airborne and disperse to receptors | <p>Identified areas which may have elevated PFAS/PFOS concentrations are limited to small areas shown in the <i>Technical Report 5 – Contamination Assessment (WSP 2019)</i>). This report includes specific management measures.</p> <p>Dust management measures are considered sufficient to manage dust from areas potentially containing PFAS however high risk areas will be identified in the site induction so all personnel are aware of the importance of dust management in these areas.</p> <p>Dust management measures will prevent visible dust from potentially contaminated areas from leaving the construction site boundary.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|--------------|---|---|----------------|-------------------|
| CBD1 | Biodiversity | Additional clearing | If additional vegetation is identified to be impacted, an ecologist will undertake further assessment for impact and the need for offsetting in accordance with the legislation, prior to clearing. | ✓ | ✓ |
| CBD2 | Biodiversity | Spread of chytrid fungus | Protocols to prevent introduction or spread of chytrid fungus will be detailed in the relevant management plan and implemented following the DPIE Hygiene protocol for the control of disease in frogs (DECC, 2008c). | ✓ | ✓ |
| CBD3 | Biodiversity | General | The project environmental induction will include information on the ecological values of the study area, protection measures to be implemented to protect biodiversity and penalties for breaches. | ✓ | ✓ |
| CBD4 | Biodiversity | Vegetation clearing | Disturbance of vegetation will be limited to the minimum necessary to construct works. The contractor will design the layout of the work areas to locate infrastructure, where practicable, to previously cleared areas or areas of exotic vegetation to minimise or avoid impacts on native vegetation (and particularly EECs). Equipment storage and stockpiling of resources will be restricted to designated areas in cleared land. | ✓ | ✓ |
| CBD5 | Biodiversity | Impact to flora and fauna during vegetation clearance or works to bridges | <p>A trained ecologist will undertake pre-clearing surveys and be present during the clearing of native vegetation or removal of potential fauna habitat during construction where necessary to avoid impacts on resident fauna as far as is practicable. Pre-clearing surveys will include:</p> <ul style="list-style-type: none"> • inspections of native vegetation for resident fauna and/or nests or other signs of fauna occupancy • inspections of bridges for roosting bats • pre-clearing surveys for the Green and Golden Bell Frog at Mill Stream as a precaution • capture and relocation or captive rearing of less mobile fauna (such as nestling birds) by a trained fauna handler and with assistance from Wildlife Information Rescue and Education Service (WIRES) as required. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|---------------|-------------------------------------|---|----------------|-------------------|
| CBD6 | Biodiversity | Impact on vegetation to be retained | Where the project site adjoins native vegetation, the limits of clearing will be marked and temporary fencing installed and maintained around the vegetated areas prior to the commencement of construction activities to avoid unnecessary vegetation and habitat removal. | ✓ | |
| CBD7 | Biodiversity | Increase in weeds | <p>Management and disposal of the weeds, including the priority weeds, will be conducted in accordance with the <i>Biosecurity Act 2015</i> and the <i>NSW Weed Control Handbook</i> (DPI 2018c)</p> <p>Vehicles and other equipment to be used within the rail corridor will be cleaned to minimise seeds and plant material entering the study area to prevent the introduction of further exotic plant species or disease.</p> | ✓ | ✓ |
| CBD8 | Biodiversity | Reinstatement of vegetation | <p>Revegetation of riparian areas along Mill Stream, Mill Pond and New Pond following construction will be undertaken by a bush regeneration contractor.</p> <p>Disturbed areas will be stabilised as soon as possible following construction and locally endemic species typical of Swamp Oak swamp forest and Coastal freshwater wetlands will be used to revegetate these disturbed riparian areas.</p> | | ✓ |
| CCT1 | Contamination | Asbestos contaminated fill material | <p>A remediation action plan (RAP) will be prepared for Area 1 in accordance with the National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) prior to placement of the asbestos capping layer.</p> <p>Remediation in Area 1 will be undertaken in accordance with the endorsed RAP. Following this, a validation report will be prepared by a suitably qualified environmental consultant to validate the suitability of the project site for its proposed use.</p> <p>Installation of the capping layer will be done under the supervision of a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM. The final elevation of residual contaminated soils will be surveyed prior to the installation of the marking layer and capping layers. Final levels should also be surveyed and included in the SWMP and ARTC asbestos register.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|---------------|--------------------------------|--|----------------|-------------------|
| CCT2 | Contamination | Potential for unidentified ACM | West of Robey Street within Area 2, existing investigations will be supplemented with additional sampling using a test pit or trenching method in accordance with NEPM 2013 and WA Department of Health (WA-DoH) 2009, <i>Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia</i> . If enabling works in this area are undertaken prior to additional sampling, ACM will be assumed to be present and works will be supervised by an appropriately licensed contractor. This will be specified in site EMPs for the enabling works. | ✓ | |
| CCT3 | Contamination | Potential for encountering ASS | An acid sulfate soils management plan (ASSMP) will be developed prior to start of enabling works in accordance with the ASSMAC (1998) <i>Acid Sulfate Soils Manual</i> and included in the SWMP. ASS encountered during construction will be managed in accordance the ASSMP. | ✓ | ✓ |
| CCT4 | Contamination | ACM impacted soils | An asbestos management plan (AMP) will be prepared prior to start of enabling works in accordance with NSW EPA guidelines (including waste guidelines), SafeWork NSW 2014, <i>Managing Asbestos in or on Soil</i> and relevant industry codes of practice. This AMP will be included in the SWMP. | ✓ | ✓ |
| CCT5 | Contamination | Surface ACM | An emu pick involving the systematic manual collection of identified asbestos surface fragments will be undertaken prior to soil disturbance in Area 1 and the section west of Robey Street in Area 2, to remove ACM fragments from the site surface. A clearance certificate will be obtained from a licensed asbestos assessor. | ✓ | |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|---------------|--|---|----------------|-------------------|
| CCT6 | Contamination | Contaminated groundwater | <p>Adopt construction techniques to avoid groundwater disturbance where practicable.</p> <p>If groundwater is encountered, temporarily store all extracted groundwater to be disposed of offsite in appropriate containers then ensure it is tested for potential contaminants (including PFAS). Options for final disposal of extracted groundwater include:</p> <ul style="list-style-type: none"> removal offsite to a water recycling facility if the level of contaminants does not exceed the water acceptance thresholds discharge to a sewer via a trade waste agreement with Sydney Water treatment through a groundwater remediation system before being released to surface water (with approval from NSW EPA). <p>For the above options, the analytical testing results will need to demonstrate compliance with the applicable licence or discharge criteria.</p> | | ✓ |
| CCT7 | Contamination | Spills and leaks contaminating soil or groundwater | <p>Procedures to store, handle and use materials and equipment appropriately to prevent spills will be prepared and implemented during construction, and included in the SWMP.</p> <p>Immediately contain and clean up leakage of fuels, oils, chemicals and other hazardous liquids in accordance with the Safety Data Sheet and ARTC's NSW Pollution Incident Response Management Plan to prevent migration of contaminants to other parts of the site.</p> | ✓ | ✓ |
| CCT8 | Contamination | Stockpile management and soil handling. | Employ stockpile management procedures as per ARTC's Standard Environmental Management Measures for segregating soil and preventing cross-contamination of clean soil with contaminated soil. These will be documented in the SWMP. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|------------------------|--------------------------|--|----------------|-------------------|
| CCT9 | Contamination | ACM contaminated areas | <p>ACM impacted soil will be handled and managed in accordance with the AMP at all times during construction.</p> <p>Areas that are designated as ACM contaminated areas will be clearly fenced off and suitable warning signs posted prior to soil disturbance in that area. Hygiene facilities will be provided incorporating a high standard of washing facilities and storage area for contaminated clothing/footwear. These areas will only be accessible to authorised personnel and work permitted only under controlled/supervised conditions by appropriately qualified/licensed personnel.</p> | ✓ | ✓ |
| CCT10 | Contamination | Unexpected contamination | An unexpected finds procedure will be prepared prior to commencement of enabling works and included as part of the SWMP. It will identify the process to follow in the event that indicators of contamination are encountered during construction (such as odours, ACM or visually contaminated materials). | ✓ | ✓ |
| CFL1 | Hydrology and flooding | Earthworks | <p>Plan, implement and maintain measures, which are aimed at:</p> <ul style="list-style-type: none"> intercepting flow from areas upstream of the project and diverting it in a controlled manner whether through or around the construction sites implementing construction practices that minimise the potential for scour through stabilisation of disturbed surfaces. | ✓ | ✓ |
| CFL2 | Hydrology and flooding | Spoil management | Spoil stockpiles will need to be located in areas which are not subject to frequent inundation by floodwater and ideally outside the 1% AEP flood extent. The CEMP will define the flood immunity criteria for stockpiles proposed to be located in areas that are inundated during a 1% AEP event. These criteria will be based on the duration of stockpiling operations, the type of material stored, the nature of the receiving drainage lines and also the extent to which the stockpile will impact flooding conditions in adjacent areas. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|------------------------|--|--|----------------|-------------------|
| CFL3 | Hydrology and flooding | Site facilities and flood emergency management | <p>As a minimum, site facilities are to be located outside high flood hazard areas based on a 1% AEP flood and ideally outside the 1% AEP flood extent.</p> <p>For site facilities located within the floodplain, the CEMP is to identify how risks to personal safety and damage to construction facilities and equipment will be managed.</p> <p>The CEMP will need to include details of:</p> <ul style="list-style-type: none"> • the procedure to monitor accurate and timely weather data, and disseminate warnings to construction personnel of impending flood producing rain • an evacuation plan for construction personnel should a severe weather warning be issued. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|------------------------|--|---|----------------|-------------------|
| CFL4 | Hydrology and flooding | Management of adverse flood impacts on existing development (construction) | <p>The CEMP will need to include details and procedures to manage the potential for proposed construction activities to adversely impact on flood behaviour in adjacent development.</p> <p>A more detailed assessment of the impact that construction activities will have on flood behaviour, as well as the scope of measures which will be required to mitigate those impacts, will need to be undertaken during the detailed design phase, with the benefit of more refined construction plans and details by the preferred construction contractor.</p> <p>Subject to the outcomes of further design development and flood assessment during the detailed design phase, a floor level survey may need to be undertaken of affected properties (ie in properties where there is a potential increase in flood levels) to determine whether construction activities will increase flood damages in adjacent development and if mitigation measures are required.</p> <p>The layout of the construction compounds, material storage areas, as well as temporary crane pads and temporary piling platforms will need to be designed to:</p> <ul style="list-style-type: none"> • limit the extent of works located in floodway areas • divert overland flow either through or around work areas in a controlled manner • minimise adverse impacts on flood behaviour in adjacent development. <p>Measures to manage residual flood impacts may include:</p> <ul style="list-style-type: none"> • staging construction to limit the extent and duration of temporary works on the floodplain • ensuring construction equipment and materials are removed from floodplain areas at the completion of each work activity or should a weather warning be issued of impending flood producing rain • providing temporary flood protection to properties identified as being at risk of adverse flood impacts during any stage of construction of the project • developing flood emergency response procedures to remove temporary works during periods of heavy rainfall. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-------------------------|--|--|----------------|-------------------|
| CWQ1 | Water quality and soils | Spills and leaks causing soil or water contamination | Procedures to store, handle and use materials and equipment appropriately to prevent spills and leaks will be included in the SWMP. | | ✓ |
| CWQ2 | Water quality and soils | Spills and leaks causing soil or water contamination | Leakage of fuels, oils, chemicals and other hazardous liquids will be immediately cleaned up in accordance with the Safety Data Sheet and relevant emergency response procedures. | ✓ | ✓ |
| CWQ3 | Water quality and soils | Spills and leaks causing soil or water contamination | Adequately stocked spill kits will be readily accessible to site personnel during all refuelling activities. | ✓ | ✓ |
| CWQ4 | Water quality and soils | Spills and leaks causing soil or water contamination | Construction plant and equipment will be regularly inspected and maintained to prevent leaks. | ✓ | ✓ |
| CWQ5 | Water quality and soils | Spills and leaks causing soil or water contamination | All potentially contaminating substances will be stored in secure, bunded and impervious locations away from surface water features and outside of the extent of the 20 year ARI design flood wherever practicable. | ✓ | ✓ |
| CWQ6 | Water quality and soils | Spills and leaks causing soil or water contamination | Impervious and bunded areas will be established for the on-site maintenance of construction plant and equipment. | ✓ | ✓ |
| CWQ7 | Water quality and soils | Erosion and sediment impacts | The area of exposed soils within the project site will be minimised through staging vegetation clearing and ground disturbing works across the project site. Disturbed areas and all long-term stockpiles will be protected or stabilised during periods of inactivity. Areas disturbed by construction activities will be rehabilitated and restored as soon as possible after completion of works in the area. | ✓ | ✓ |
| CWQ8 | Water quality and soils | Erosion and sediment impacts | Where feasible, construction activities will be scheduled to avoid ground disturbance works or in-stream works during periods of heavy or prolonged rainfall. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|-------------------------|---|---|----------------|-------------------|
| CWQ9 | Water quality and soils | Erosion and sediment impacts | Protect stockpiles of loose material from erosion due to rain and wind. | ✓ | ✓ |
| CWQ10 | Water quality and soils | Erosion and sediment impacts | Erosion and sediment control measures will be implemented prior to soil disturbance in accordance with <i>Managing Urban Stormwater: Soils and Construction Volume 1</i> (Landcom, 2004) and included in the SWMP. Erosion and sediment controls throughout the project site will be regularly inspected and maintained. | ✓ | ✓ |
| CWQ11 | Water quality and soils | Erosion and sediment impacts | Remove all material from the site as soon as practical at the completion of work. | ✓ | ✓ |
| CWQ12 | Water quality and soils | Erosion and sediment impacts | Specific measures and procedures for works within waterways, such as the use of silt barriers will be implemented where necessary. | | ✓ |
| CWQ13 | Water quality and soils | Erosion and sediment impacts | Instruct site workers on the need to prevent materials from washing or blowing into the stormwater system. | ✓ | ✓ |
| CWQ14 | Water quality and soils | Erosion and sediment impacts | Infiltration trenches will be installed to allow for potentially contaminated water to be collected and infiltrated back into groundwater rather than flowing to surface water. | ✓ | ✓ |
| CWQ15 | Water quality and soils | Groundwater and surface water impacts during construction | A groundwater construction monitoring program will be prepared and implemented as per chapter 8 of <i>Technical Report 7 – Groundwater Impact Assessment</i> . This monitoring program will verify the effectiveness of construction activities at preventing changes in the beneficial use potential of the aquifer system. A surface water quality monitoring program will be prepared and implemented for specific construction works (refer to section 6.2.3 of <i>Technical Report 8 Surface Water Impact Assessment</i>). | | ✓ |
| CWQ16 | Water quality and soils | Litter polluting waterways | Bins will be provided on-site for litter. All general litter and waste collected on-site will be transported off-site to an appropriate waste facility. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-------------------------|--|---|----------------|-------------------|
| CNH1 | Non-Aboriginal heritage | Significant items within, and outside of, the study area | <p>For the Botany Water Reserves (also known as Botany Wetlands or Botany Swamps), the following site specific management measures will be implemented:</p> <ul style="list-style-type: none"> • establishment of fenced exclusion zones around the item's SHR curtilage to prevent inadvertent impacts to the item prior to, and during construction of the project • engagement of an arborist to ensure significant plant species are not impacted during the construction phase if impacts outside of the project footprint are proposed • archaeological monitoring in areas assessed as containing low potential for Phase 1 archaeological remains where subsurface impacts are proposed. This would be carried out in accordance with recommendations set out in Section 11.5 of <i>Technical Report 9 – Statement of Heritage Impact</i>. | ✓ | ✓ |
| CNH2 | Non-Aboriginal heritage | Significant items within, and outside of, the study area | The CEMP will identify measures to specifically minimise the potential impact to the bridge during the construction phase of the project. This may include establishment of protective barriers or pads around elements of the bridge to ensure impacts to fabric are avoided. | ✓ | ✓ |
| CNH3 | Non-Aboriginal heritage | Significant items within, and outside of, the study area | The CEMP will include measures to prevent inadvertent impacts to fabric within the curtilage of the Sydney Airport Group south of Qantas Drive. This may include establishment of an exclusion zone around the LEP curtilage for the item. The inclusion of the exclusion zone in the ECMs would be appropriate. | ✓ | ✓ |
| CNH4 | Non-Aboriginal heritage | Significant items within, and outside of, the study area | For the potential archaeological remains shown in Figure 15.4, archaeological monitoring or testing will be undertaken (where required) in accordance with recommendations set out in Section 11.5 of <i>Technical Report 9 – Statement of Heritage Impact</i> . | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-------------------------|---------------------------------|---|----------------|-------------------|
| CNH5 | Non-Aboriginal heritage | Photographic archival recording | <p>Photographic archival recording and reporting will be carried out in accordance with the NSW Heritage Office's How to Prepare Archival Records of Heritage Items (1998), and Photographic Recording of Heritage Items Using Film or Digital Capture (NSW Heritage Office 2006) for the following items:</p> <ul style="list-style-type: none"> • Mascot (Botany Road) Underbridge • Mascot (O'Riordan Street) Underbridge • Mascot (Robey Street) Underbridge • existing nature and elements of the Botany Rail Line located within the study area. <p>The relevant record will be prepared by a suitably qualified heritage consultant using archival-quality material prior to the demolition or modification of each bridge, and main construction works to Botany Line. Additional recording may also take place during bridge removal. Records for LEP-listed items will be held by the local Council and local library. A copy of the record will be held by the owner of the asset.</p> | | ✓ |
| CNH6 | Non-Aboriginal heritage | S170 notification | <p>As the items listed on the ARTC s170 register will be demolished, a s170 notification will be provided to Sydney Trains and the NSW Heritage Division prior their demolition:</p> <ul style="list-style-type: none"> • Mascot (O'Riordan Street) Underbridge • Mascot (Robey Street) Underbridge. | | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|-------------------------|---------------------------|--|----------------|-------------------|
| CNH7 | Non-Aboriginal heritage | Archaeological management | <p>The location of subsurface excavations will be designed, where possible to avoid areas containing low or moderate potential for State and locally significant Phase 1 and 2 resources.</p> <p>If these impacts cannot be avoided, a Historical Archaeological Assessment and Research Design (HAARD) and Excavation Methodology would be prepared once designs for the project have been finalised and the extent and depth of subsurface excavations are known. Likely recommended archaeological management includes:</p> <ul style="list-style-type: none"> • East: Land surrounding Mill Pond and immediately north and south of Southern Cross Drive – archaeological monitoring and recording with potential salvage. • Central: Land to the north and south of General Holmes Drive, west of the Botany Rail Line – archaeological test excavations or monitoring and recording to the south and archaeological monitoring and recording to the north, both with the potential for salvage. • West: No archaeological resources considered to contain local or State significance are located in this portion of the study area – unexpected finds protocol. The HAARD will recommend appropriate archaeological management and research questions based on final detailed design. It will also include a requirement that all archaeological monitoring and test excavations be led by a suitably qualified heritage consultant who meets the NSW Heritage Council's Excavation Director criteria. | ✓ | ✓ |
| CNH8 | Non-Aboriginal heritage | Heritage induction | <p>The project environmental induction will include making contractors aware of areas of high/moderate archaeological potential, areas containing highly significant fabric, relevant strategies to minimise potential impacts on archaeological remains and heritage fabric, information regarding the identification and management of unexpected archaeological and heritage finds and their obligations under NSW heritage legislation and the conditions of approval for the project.</p> <p>The induction will be provided to relevant contractors and subcontractors and its preparation overseen and approved by a suitably qualified heritage professional.</p> | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|-------|-------------------------|--|---|----------------|-------------------|
| CNH9 | Non-Aboriginal heritage | Unexpected finds | An Unexpected Finds Procedure will be established and implemented in the case of unexpected structural and archaeological finds in areas assessed as containing nil and low archaeological potential. | ✓ | ✓ |
| CNH10 | Non-Aboriginal heritage | Unexpected finds | The Heritage Council must be notified if a relic is uncovered during construction | ✓ | ✓ |
| CAH1 | Aboriginal heritage | Unexpected discovery of Aboriginal objects | An unexpected finds procedure will be prepared and include requirements for: <ul style="list-style-type: none"> protecting any unexpected finds (including Aboriginal heritage items and human skeletal remains) encountered during construction activities procedures to manage reporting and investigation when unexpected finds are encountered. | ✓ | ✓ |
| CAH2 | Aboriginal heritage | Unexpected discovery of human remains | If suspected human skeletal remains are uncovered at any time throughout undertaking the proposed works, the unexpected finds procedure will be implemented. | ✓ | ✓ |
| CLP1 | Land use and property | Billboard modification/ relocation | The removal, and reinstatement of billboards will be undertaken in consultation with land owners and billboard owners. | ✓ | ✓ |
| CLP2 | Land use and property | Billboard modification/ relocation | As a priority, billboards will be replaced like for like. If replacement and relocation are not available, the affected parties will be appropriately compensated under the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> . | ✓ | ✓ |
| CLP3 | Land use and property | Access to private property/ businesses/ Sydney Airport | Consultation will be carried throughout construction with the surrounding businesses, the local community and key stakeholders including Bayside Local Council, Sydney Airport and other potentially impacted stakeholders to advise them in advance of proposed works and any temporary access arrangements that may be required. | ✓ | ✓ |
| CLP4 | Land use and property | Access to private property/ businesses/ Sydney Airport | Prior to any impact on access, alternative arrangements will be negotiated with the affected parties in order to enable continued access and to minimise disruption as much as reasonably possible. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|--|---|---|----------------|-------------------|
| CLP5 | Land use and property | General construction activities | Affected property owners and businesses will be provided with advanced notification of relevant project schedules, construction works and changes to access arrangements. | ✓ | ✓ |
| CLV1 | Landscape character and visual amenity | Landscape character and visual impact from residential properties | Shade cloth screening on site boundary fencing will be provided where works or compound sites are being undertaken in close proximity to residential areas to screen street level views into the construction site, such as: <ul style="list-style-type: none"> • Myrtle Street • Bay Street • Ellis Street • Banksia to Morgan Street. | ✓ | ✓ |
| CLV2 | Landscape character and visual amenity | Visual impact from construction lighting at night | Temporary lighting required during the construction period will be sited and designed to avoid light spill into residential properties. Particular consideration will be given to works near Baxter Road, McBurney Avenue and between Myrtle Street and Stephen Road which are located close to residential properties and hotels. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|--------------------------------|--|---|----------------|-------------------|
| CSO1 | Social | Changes to amenity and access due to construction | <p>The community will be informed about changes to amenity and access through the community and stakeholder engagement plan. The plan will include:</p> <ul style="list-style-type: none"> • communication with residents to provide an overview of the project, and the likely nature, extent and duration of amenity and access changes as a result of construction. Particular attention will be given to ensuring any vulnerable groups are appropriately targeted, these may include families with children, people with need for assistance, older people, people with disability, people with mobility difficulties or medical conditions, and culturally and linguistically diverse people in Mascot • communication of measures to minimise construction fatigue experienced by residents, businesses and general community members (such as construction respite periods associated with out of standard construction hours works, if required) • communication of the complaints and enquiry procedure through which community members can contact the project to raise any concerns regarding amenity and access changes, such as the ARTC Enviroline. | ✓ | ✓ |
| CSO2 | Social | Amenity and access changes affecting community infrastructure facilities and users due to construction | <p>Targeted communication on measures to minimise impacts on amenity and access will be carried out with the following stakeholders:</p> <ul style="list-style-type: none"> • Bayside Council about timing of the most noise intensive works and changed traffic conditions that may affect public open space areas and active transport routes within the LGA • Community infrastructure and accommodation facilities (hotels) if direct impacts are identified such as temporary changes to access or utility services. | ✓ | ✓ |
| CRW1 | Resources and waste management | Resource use | Where feasible and practicable, construction material will be sourced from within the Sydney region. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|--------------------------------|---|---|----------------|-------------------|
| CRW2 | Resources and waste management | Enabling works waste generation and resource use | <p>Site EMPs will be prepared before any enabling works begin. The Site EMPs will detail how waste will be managed during enabling works activities that could generate significant waste eg billboard removal and vegetation clearance. The Site EMPs will include:</p> <ul style="list-style-type: none"> • all key early and enabling works waste streams • classification of waste streams in accordance with the Waste Classification Guidelines (EPA, 2014a) • applicable resource recovery orders and exemptions including the existing 'The Australian Rail Track Corporation excavated material order 2019' and 'The Australian Rail Track Corporation excavated material exemption 2019' • waste identification, handling and segregation procedures • proposed waste reuse, recovery and recycling and disposal measures • waste tracking, record keeping and reporting requirements • key sources of construction related resource use • energy conservation and energy efficiency practices to be implemented. | ✓ | |
| CRW3 | Resources and waste management | Main construction works waste generation and resource use | <p>The CEMP will consider management of all construction waste including spoil in accordance with the waste management hierarchy. The CEMP will include:</p> <ul style="list-style-type: none"> • all key construction waste streams • classification of waste streams in accordance with the <i>Waste Classification Guidelines</i> (EPA, 2014a) • applicable resource recovery orders and exemptions including the existing 'The Australian Rail Track Corporation excavated material order 2019' and 'The Australian Rail Track Corporation excavated material exemption 2019' • waste identification, handling and segregation procedures • spoil disposal locations, onsite spoil management and offsite transport protocols • proposed waste reuse, recovery and recycling and disposal measures • waste tracking, record keeping and reporting requirements • key sources of construction related resource use • energy conservation and energy efficiency practices to be implemented. | | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|--------------------------------|--|--|----------------|-------------------|
| CRW4 | Resources and waste management | Main construction works waste generation and resource use | Construction waste will be minimised by accurately calculating materials brought to the site and limiting materials packaging. | ✓ | ✓ |
| CRW5 | Resources and waste management | Main construction works waste generation and resource use | All waste will be assessed, classified, managed and disposed of in accordance with the <i>Waste Classification Guidelines</i> (EPA, 2014a). | ✓ | ✓ |
| CRW6 | Resources and waste management | Stockpile management | <p>The size of stockpiles will be determined by material quantity requirements, space availability, stockpile stability and safety, indicative volumes and restrictions. Stockpile siting and management will include the following parameters:</p> <ul style="list-style-type: none"> • will be no higher than three metres • will be sited as far as practical from sensitive receivers and where possible equipment i.e. site compound buildings, sited between the stockpile and receiver • will be located in areas which are not subject to frequent inundation by floodwater and ideally outside the 1% AEP flood extent • will not be sited next to schools or day care facilities • will be temporary and material not needed for ongoing maintenance will be removed at completion of construction. | ✓ | ✓ |
| CHS1 | Risks, health and safety | Risks to infrastructure from utility works during enabling works | The site EMPs will include a section specific to utility management and utility protection. | ✓ | |
| CHS2 | Risks, health and safety | Risks to public safety from general construction activities | Construction-related risks related to public safety from general construction activities (listed in section 21.3.1) will be incorporated into the relevant management plans with measures to minimise and manage risks. | ✓ | ✓ |
| CHS3 | Risks, health and safety | Chemical and explosive management | The management of all chemicals and detonators used during construction will comply with the relevant Australian Standard. | ✓ | ✓ |

| REF | TOPIC | IMPACT | MEASURES | ENABLING WORKS | MAIN CONSTRUCTION |
|------|--------------------------|--|--|----------------|-------------------|
| CHS4 | Risks, health and safety | Dangerous goods use and storage quantities exceeded | The relevant management plan will include a review of the required dangerous goods quantities to be used and stored during construction to validate Applying SEPP 33 (DoP 2011a) screening assessment. If the Applying SEPP 33 (DoP 2011a) thresholds levels are not exceeded, no further work is needed. If the Applying SEPP 33 (DoP 2011a) thresholds are exceeded, a preliminary hazard analysis will be completed and provided to the DPIE for reference. | ✓ | ✓ |
| CHS5 | Risks, health and safety | Construction plant infringing Sydney Airport obstacle limitation surface | Management plans will be developed and implemented for the project to ensure that the necessary approvals are sought, particularly for the use of cranes. Use of cranes will comply with <i>National Airports Safeguarding Framework Guideline F</i> (DIRDC, n.d.) Where necessary, use of cranes that will infringe the obstacle limitation surface will be limited to curfew hours and/or permits obtained from Sydney Airport. | ✓ | ✓ |
| CHS6 | Risks, health and safety | Construction lighting producing light spill in the direction of incoming Sydney Airport aircraft | Management plans will be developed and implemented for the project to ensure the lights proposed for use comply with CASA Manual of Standards 139 section 9.21 and <i>National Airports Safeguarding Framework Guideline E</i> (DIRDC, n.d.). | ✓ | ✓ |
| CHS7 | Risks, health and safety | Risk of wildlife strikes to Sydney Airport aircraft due to attraction of wildlife to areas near airport operations | Management plans will include measures to minimise waste attracting wildlife, particularly birdlife. These will include, but not be limited to: <ul style="list-style-type: none"> • food waste being stored in covered bin • waste being regularly removed from site. | ✓ | ✓ |

Table 24.4 Compilation of mitigation measures during operation

| REF | TOPIC | IMPACT | MEASURES |
|------|---------------------|--|--|
| ONV1 | Noise and vibration | Operational noise impacts | <p>An Operational Noise and Vibration Review (ONVR) will be prepared to confirm the noise and vibration impacts from the project and to define the mitigation measures used to control the impacts. The ONVR will be prepared in consultation with affected stakeholders and the community. It will:</p> <ul style="list-style-type: none"> • be based on the operational noise and vibration objectives identified in <i>Technical Report 2 – Noise and Vibration Impact Assessment</i> • confirm the predicted operational noise and vibration impacts at the surrounding receivers based on the final design • review the suitability of the operational noise mitigation measures identified below and any other measures which may be considered appropriate to manage additional impacts identified as a result of design changes and include the timing of implementation • include a consultation strategy to seek feedback from directly affected landowners on the noise and vibration mitigation measures • outline how complaints will be managed in accordance with ARTC's existing complaints handling service (Enviroline). <p>The ONVR will be prepared with reference to the <i>ARTC Noise Prediction and Mitigation Guideline</i> (ARTC, 2018) and will be made publicly available once complete.</p> |
| ONV2 | Noise and vibration | Operational noise impacts | <p>Implement noise and mitigation source controls, path controls and/or receiver controls where feasible and reasonable as determined during detailed design. These mitigation measures will be included in the ONVR, with the identified measures being managed through ARTC's environmental management system for operation of the project.</p> |
| OAQ1 | Air quality | Operational emissions | <p>Plant and equipment used for maintenance works will be operated in accordance with manufacturer specifications and ARTC's Safety Management System and Environment Management System.</p> |
| OAQ2 | Air quality | Release of odour and pollutants from contaminated land | <p>Ongoing management measures will be implemented for areas where contamination remains following construction. These management measures will be documented in an environmental management plan that is specific to contamination. In particular, the plan will clearly identify areas of remaining ACM impacts and detail the controls to be implemented during maintenance works likely to disturb soils. The plan will also detail the requirements for periodic inspections of ACM capping layer to ensure its integrity.</p> |

| REF | TOPIC | IMPACT | MEASURES |
|------|-------------------------|--|---|
| OBD1 | Biodiversity | Increase in weeds | ARTC's Assessment Management System (under the Safety Management System) includes provision for regular weed management and ARTC's Environmental Management System provides procedures for weed management and pesticide use. Ongoing weed management throughout the rail corridor will be undertaken in accordance with ARTC's procedures, as well as relevant legislation such as the <i>Biosecurity Act 2015</i> . |
| OCT1 | Contamination | Spills and leaks contaminating soil or groundwater | Potential spills and/or leaks will be managed in accordance with ARTC's pollution incident response procedure (under the Environment Management System) or in accordance with an Operator's Operational Management Environmental Management Plan (OEMP) prepared in accordance with ARTC's access agreement requirements (depending on the extent and nature of the spill). |
| OCT2 | Contamination | Potential spillage from lubricant system | Biodegradable low risk non-petrogenic products will be used where appropriate. |
| OCT3 | Contamination | Containment of contaminated soils | The location and nature of any known contamination will be registered on ARTC's Contaminated Land Register and ARTCMap (internal GIS system). Prior to maintenance works in the corridor, a Task Based Environmental Assessment (TBEA) will be prepared which identifies known environmental sensitivities, including contamination. ARTC's Standard Environment Management Measures (under the Environment Management System) include procedures for no go zones for known areas of in-situ contamination, which will be implemented prior to maintenance works likely to disturb soils. ARTC's Work, Health and Safety work instructions will also be used for works near known contamination. Any required inspections of the capping layer undertaken by ARTC will be undertaken in accordance with ARTC's Asset Management System procedures. These procedures will be summarised in a site management plan in accordance with the CLM framework, which will be prepared by an environmental consultant and guide the management of residual contamination within the project site. This may be a standalone plan, or combined with site management plans that relate to adjacent areas. |
| OWQ1 | Water quality and soils | Formation failure | Regular inspections of formation and any necessary repairs will be undertaken in accordance with ARTC's Safety Management System procedures. |
| OWQ2 | Water quality and soils | Water or soil impacts from maintenance works | The existing ARTC Standard Environmental Management Measures (under the Environment Management System) will be implemented to manage impacts from maintenance works, including potential litter. |
| ONH1 | Non-Aboriginal heritage | Unexpected finds | The existing ARTC Standard Environmental Management Measures (under the Environment Management System) will be implemented to manage the potential for unexpected non-Aboriginal heritage finds. |

| REF | TOPIC | IMPACT | MEASURES |
|------|--------------------------------|--|--|
| OAH1 | Aboriginal heritage | Unexpected discovery of Aboriginal objects or human remains | The existing ARTC Standard Environmental Management Measures (under the Environmental Management System) will be implemented to manage the potential for unexpected discovery of Aboriginal objects or human remains. |
| OSO1 | Social | Amenity change (noise) due to operation | The ONVR will include a consultation strategy to seek feedback from directly affected landowners on the noise and vibration mitigation measures. This will be the use of the Enviroline mechanism for communication with local residents and businesses impacted by at-property noise mitigation measures. |
| ORW1 | Resources and waste management | Operational waste generation | The existing ARTC Standard Environmental Management Measures (under the Environment Management System), which include measures for identification, classification, management and disposal of waste will be implemented to manage operational waste generation. |
| OHS1 | Risks, health and safety | Disruption of utility services or rail services | Communication with utility service providers during maintenance (both rail and utility) will be undertaken in accordance with the ARTC Safety Management System. |
| OHS2 | Risks, health and safety | Personal injury (within the community) relating to maintenance activities around utilities | Utility maintenance works will be undertaken in accordance with safety protocols prescribed in ARTC's Safety Management System, ARTC's Safety Management System includes requirements for safe work method statements, which will be prepared as required for utility maintenance works. |
| OCC1 | Climate change | Risk of extreme weather event affecting infrastructure and operations | ARTC's Asset Management System includes provision for regular inspections and maintenance. In accordance with ARTC's Asset Management System. Inspections of drainage infrastructure will be undertaken, to ensure operating at design capacity. |
| OCC2 | Climate change | Risk of extreme weather event affecting infrastructure and operations | Equipment rooms will be designed in accordance with the relevant standards and to consider future extreme heat events due to climate change. Response to such events will be in accordance with ARTC's safety management system and standard operating procedures. |
| OCC3 | Climate change | Risk of extreme weather event affecting infrastructure and operations | Where infrastructure is to be replaced during maintenance, it will be undertaken in accordance with the relevant standards and will consider the most up to date climate change projections. Response to such events will be in accordance with ARTC's standard operating procedures. |

| REF | TOPIC | IMPACT | MEASURES |
|------|----------------|---|--|
| OCC4 | Climate change | Risk of extreme weather event affecting infrastructure and operations | Weather forecasting will be taken into consideration when planning maintenance works in accordance with ARTC's Standard Management Measures (under the Environmental Management System). |

24.4 Compilation of performance outcomes

The SEARs identify a number of desired performance outcomes for the project. These desired performance outcomes outline the broader objectives to be achieved during design, construction and operation. Based on the outcomes of the environmental impact assessment and implementation of the mitigation measures (Chapters 8 to 21), environmental performance outcomes have been established (refer to Table 24.5).

Future design development and any design changes would be considered against these environmental performance outcomes.

Table 24.5 Compilation of environmental performance outcomes

| KEY ISSUE (AS LISTED IN THE SEARS) | SEARS DESIRED PERFORMANCE OUTCOMES | PROJECT SPECIFIC ENVIRONMENTAL PERFORMANCE OUTCOMES |
|------------------------------------|---|--|
| 1 Transport and traffic | <p>Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts.</p> <p>The safety of transport system customers is maintained.</p> <p>Impacts on network capacity and the level of service are effectively managed.</p> <p>Works are compatible with existing infrastructure and future transport corridors.</p> | <p>The project assists in the following:</p> <ul style="list-style-type: none"> • meeting the forecast demand for container freight transport on the Botany Line • encouraging a shift in freight transport from road to rail, supporting a reduced rate of growth in truck movements and associated traffic congestion • minimising impacts on the local and regional network during construction • maintaining motorist, pedestrian and cyclist safety • maintaining safe access to properties. |
| 2 Noise and vibration – amenity | <p>Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on acoustic amenity.</p> <p>Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and well-being of the community.</p> | <p>The project minimises impacts on the local community by:</p> <ul style="list-style-type: none"> • controlling noise and vibration at the source • controlling noise and vibration on the source to receiver transmission path • controlling noise and vibration at the receiver • implementing practicable and reasonable measures to minimise the noise and vibration impacts of construction activities on local sensitive receivers. |
| 3 Noise and vibration – structural | <p>Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings and items including Aboriginal places and environmental heritage.</p> <p>Increases in noise emissions and vibration affecting environmental heritage as defined in the <i>Heritage Act 1977</i> during operation of the project are effectively managed.</p> | <p>The project minimises impacts on structures by:</p> <ul style="list-style-type: none"> • controlling vibration at the source • controlling vibration on the source to receiver transmission path • implementing practicable and reasonable measures to minimise vibration impacts during construction and operation. |

| KEY ISSUE (AS LISTED IN THE SEARS) | SEARS DESIRED PERFORMANCE OUTCOMES | PROJECT SPECIFIC ENVIRONMENTAL PERFORMANCE OUTCOMES |
|------------------------------------|--|--|
| 4 Heritage | <p>The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places.</p> <p>The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.</p> | <p>The project is designed to minimise the surface footprint.</p> <p>The design is sympathetic to the heritage significance of surrounding listed heritage items and, where practicable, avoids and minimises impacts on heritage.</p> <p>Impacts on heritage are managed in accordance with relevant legislation, including the EP&A Act, the <i>Heritage Act 1977</i> and relevant guidelines.</p> |
| 5 Biodiversity | <p>The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity.</p> <p>Offsets and/or supplementary measures are assured, which are equivalent to any remaining impacts of project construction and operation.</p> | <p>The project is designed to minimise impacts on biodiversity. Where practicable, the design minimises the need to clear vegetation and recommends offsets where vegetation loss cannot be avoided.</p> <p>The project would minimise further impacts on biodiversity through the implementation of relevant mitigation measures.</p> <p>Potential impacts on biodiversity are managed in accordance with relevant legislation.</p> |
| 6 Flooding | <p>The project minimises adverse impacts on existing flooding characteristics.</p> <p>Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure.</p> | <p>Construction is undertaken in a manner that minimises the potential for adverse flooding impacts, through the implementation of mitigation measures.</p> <p>During operation the project would have no significant impact on the extent of the floodplain or its hazard categorisation. Changes in flooding patterns would not result in a significant change to the Flood Planning Area or the future development potential of land located outside the project footprint, or the social and economic costs of flooding.</p> |

| KEY ISSUE (AS LISTED IN THE SEARS) | SEARS DESIRED PERFORMANCE OUTCOMES | PROJECT SPECIFIC ENVIRONMENTAL PERFORMANCE OUTCOMES |
|------------------------------------|--|--|
| 7 Water – Hydrology | <p>Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised.</p> <p>The environmental values of nearby, connected and affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained (where values are not achieved).</p> <p>Sustainable use of water resources.</p> | <p>Construction compounds and work areas are laid out such that flows are not significantly impeded.</p> <p>Some minor material within Mill Stream would be excavated and scour protection constructed along the eastern and western banks of Mill Stream. The project avoids long term impacts on surface water.</p> <p>Groundwater drawdown impacts during both construction and operation is considered negligible. No Groundwater Dependent Ecosystems are present in the project site or would be affected by the project.</p> <p>During operation, negligible change to the existing conditions is expected.</p> <p>Opportunities to reuse water resources are achieved during the design process and the use of water during construction is minimised.</p> |
| 8 Water – Quality | <p>The project is designed, constructed and operated to protect the NSW Water Quality Objectives where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable).</p> | <p>Impacts on water quality are minimised during construction and operation.</p> <p>Erosion and sediment controls during construction are implemented in accordance with <i>Managing Urban Stormwater: Soils and Construction Volume 1</i> (Landcom, 2004) and <i>Managing Urban Stormwater: Soils and Construction Volume 2</i> (DECC, 2008a).</p> <p>The project will protect or contribute to achieving the Water Quality Objectives, during construction and operation.</p> <p>Construction water quality discharge will comply with the requirements of ARTC's management plans.</p> |
| 9 Soils | <p>The environmental values of land, including soils, subsoils and landforms, are protected.</p> <p>Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.</p> | <p>Site-specific soil characteristics are taken into consideration during detailed design and construction.</p> <p>Any contamination is managed in accordance with relevant regulatory requirements.</p> <p>Any soil waste is assessed, classified, managed and disposed of in accordance with the <i>Waste Classification Guidelines</i> (EPA, 2014a).</p> |

| KEY ISSUE (AS LISTED IN THE SEARS) | SEARS DESIRED PERFORMANCE OUTCOMES | PROJECT SPECIFIC ENVIRONMENTAL PERFORMANCE OUTCOMES |
|------------------------------------|--|--|
| 10 Air quality | The project is designed, constructed and operated in a manner that minimises air quality impacts (including nuisance dust and odour) to minimise risks to human health and the environment to the greatest extent practicable. | <p>The project is constructed and operated in accordance with the requirements of the <i>Protection of the Environment Operations Act 1997</i> and ARTC's existing environmental management system.</p> <p>Potential impacts would result from the generation of dust from construction works. Air quality impacts are expected to be minor and manageable through established mitigation and management measures. Impacts from odour are not anticipated.</p> <p>Operational air quality impacts are not anticipated for any pollutants. Operational air quality impacts from the project were not deemed to be significant.</p> <p>Air quality impacts are not considered to be of significance or of concern in relation to community health.</p> |
| 11 Health and Safety | <p>The project avoids or minimises any adverse health impacts arising from the project.</p> <p>The project avoids, to the greatest extent possible, risk to public safety.</p> | <p>Construction targets zero safety incidents.</p> <p>Dust, odour and other emissions will be effectively managed to avoid human health impacts.</p> <p>Noise will be managed to comply with relevant criteria and minimise the potential for health impacts.</p> |
| 12 Hazards and Risks | <p>The project avoids or minimises any adverse impacts arising from the use or proximity to hazardous goods.</p> <p>The project avoids, to the greatest extent possible, risk to public safety.</p> | <p>All dangerous goods are stored, handled and transported in accordance with relevant regulatory requirements and Australian Standards.</p> <p>Any works to utilities and high pressure pipelines will be in accordance with relevant regulatory requirements and Australian Standards.</p> <p>There will be no impacts on the operations of Sydney Airport. Any short term intrusion into the airspace will involve consultation with Sydney Airport Corporation Limited and the relevant approval process followed.</p> |

| KEY ISSUE (AS LISTED IN THE SEARS) | SEARS DESIRED PERFORMANCE OUTCOMES | PROJECT SPECIFIC ENVIRONMENTAL PERFORMANCE OUTCOMES |
|--|---|--|
| 13 Socio-economic, Land Use and Property | <p>The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities.</p> <p>The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.</p> | <p>During construction there would be temporary leasing of land for site compounds, the removal and replacement of advertising billboards, and disruptions to access of private properties in the vicinity of the project site.</p> <p>The design of the project minimises permanent land take outside of the rail corridor.</p> <p>Overall, the project is expected to result in long term social and economic benefits to local and Greater Sydney communities. These mainly relate increased rail freight efficiency and capacity across the regional and national freight network and less congestion on the road due to reduced freight movements made by trucks.</p> |
| 14 Sustainability | <p>The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources.</p> <p>Conservation of natural resources is maximised.</p> | <p>The design of the project would be based on the principles of sustainability. A sustainability assessment is being carried out under the Infrastructure Sustainability Council of Australia's Infrastructure Sustainability Rating Tool version 2.0. The project considers governance, economic, environment and social principles.</p> |
| 15 Waste | <p>All wastes generated during the construction and operation of the project are effectively stored, handled, treated, reused, recycled and/or disposed of lawfully and in a manner that protects environmental values.</p> | <p>Suitable spoil will be recycled or reused.</p> <p>Off-site waste re-use will be managed in accordance with relevant NSW EPA resource recovery exemptions and requirements.</p> <p>Waste will be disposed of at appropriately licensed facilities.</p> |
| 16 Climate Change Risk | <p>The project is designed, constructed and operated to be resilient to the future impacts of climate change.</p> | <p>Climate change risks are considered throughout the design and development process.</p> <p>The project is designed to maximise climate change resilience while minimising costs and impacts on the community and environment.</p> <p>The climate change risk assessment is maintained in line with updated global climate models and regional projection data.</p> <p>The project is designed, constructed and operated in accordance with relevant climate change legislation and guidelines.</p> |

24.5 Sustainability

The project was assessed against the Infrastructure Sustainability Council of Australia's (ISCA) Infrastructure Sustainability (IS) Rating Tool Version 2.0.

The IS rating scheme is an industry-compiled, voluntary sustainability performance rating scheme that evaluates planning, design, construction and operation of a project. In order to help projects reach their full sustainability potential, ISCA offers ratings across the full life cycle of an infrastructure asset including the IS rating tools for Planning, Design and As Built and Operation. Figure 24.2 shows the assessment tools (rating products). The project has been assessed against the portion of the tool that relates to the Design and as Built rating (refer to Figure 24.2).

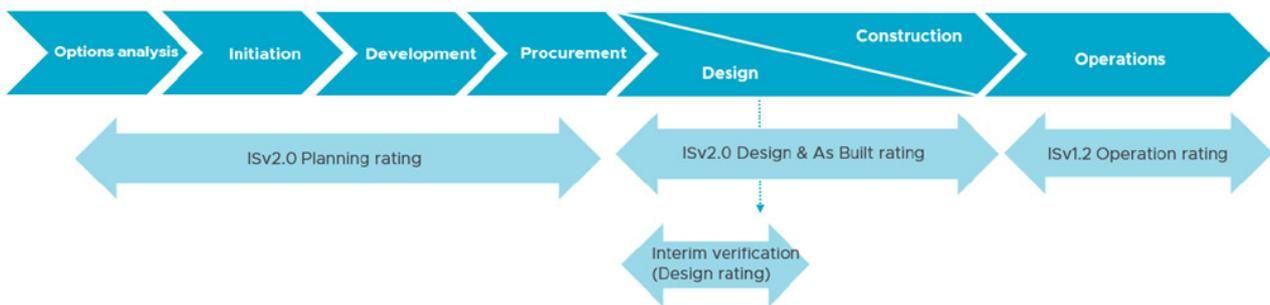


Figure 24.2 ISCA assessment tools across the project life cycle (ISCA, 2018)

Based on the preliminary assessment against IS Rating Version 2.0 the project could achieve a **bronze rating**. The IS performance categories and credits that have been assessed to achieve a bronze rating are listed in Table 24.6. The table provides information about the proposed pathway to achieve the bronze rating, which is subject to feasibility of fulfilling credit requirements in the future.

This assessment is preliminary and, due to the current early stage of the project, there may be changes to proposed target levels as the project progresses and additional information becomes available.

Table 24.6 IS categories considered

| THEME | CATEGORY | CREDIT | NAME | TARGET LEVEL (DESIGN) ¹ | JUSTIFICATION |
|-------------------|-------------------------|--------|--|------------------------------------|---|
| Governance | Context | Con-2 | Urban and Landscape Design context | Level 0 (of 3) | The project has limited interface with the public domain during operation with urban and landscape design not being a priority. |
| | Leadership & Management | Lea-1 | Integrating Sustainability | Level 2 (of 3) | The levels have been determined based on the materiality assessment and assessment of sustainability risks and opportunities for the project. Knowledge Sharing has been targeted at Level 0.3 based on the sharing of knowledge and lessons learned from other projects. |
| | | Lea-2 | Risks and Opportunities | Level 1 (of 3) | |
| | | Lea-3 | Knowledge Sharing | Level 0.3 (of 1) | |
| | Sustainable Procurement | Spr-1 | Risk and Opportunity Assessment and Procurement Strategy | Level 1 (of 3) | The project's current procurement processes and sustainability risks and opportunities in the supply chain suggest meeting Level 1 is achievable within this category. |
| | | Spr-2 | Supplier Assessment and Selection | Level 1 (of 3) | |
| | | Spr-3 | Contract and Supplier Management | Level 1 (of 3) | |
| | Resilience | Res-1 | Resilience Plan | Level 1 (of 3) | Level 1 of Res-1 would be able to be achieved at later project stages. It is expected direct climate change and natural hazards risks will have treatment measures implemented at the detailed design stage. |
| | | Res-2 | Climate and Natural Hazards Risks | Level 1 (of 3) | |
| | Innovation | Inn-1 | Innovation | Level 1 (of 10) | Innovation rewards are at the discretion of ISCA and will be considered as part of detailed design. A conservative estimate of one innovation point has been made. |

¹ These target levels for the Design Rating are based on the IS v 2.0 'Design and As Built' technical manual.

| THEME | CATEGORY | CREDIT | NAME | TARGET LEVEL (DESIGN) ¹ | JUSTIFICATION | |
|-----------------------|------------------------------------|-----------------------|---|---|--|--|
| Economic | Options Assessment & Business Case | Ecn-1 | Options Assessment | Level 0 (of 2) | The levels have been determined based on the potential for significant project initiatives to undergo whole-of-life costing. | |
| | | Ecn-4 | Economic Viability and Financial Affordability | Level 2 (of 2) | | |
| | Benefits | Ecn-5 | Benefits Mapping | Level 0 (of 3) | | |
| Environmental Impacts | Energy & Carbon | Ene-1 | Energy Efficiency | Level 2 (of 3) | Achievement of Level 2 for Ene-1 requires development of base case and implementation of energy savings initiatives. Given the nature of the project and the low materiality of the credits Ene-2 and Ene-3 their requirements are not currently within the scope. | |
| | | Ene-2 | Renewable Energy | Level 0 (of 3) | | |
| | | Ene-3 | Carbon Offsetting | Level 0 (of 3) | | |
| | Green Infrastructure | Gre-1 | Green Infrastructure | Level 1 (of 3) | Incorporation of green infrastructure may be considered at a later stages of project design to achieve Level 1. | |
| | Environmental Impacts | Environmental Impacts | Env-1 | Receiving Water Quality | Level 2 (of 3) | The individual levels reflect the project's management practices for preventing and mitigating discharges to air, water and land including receiving water quality, noise, vibration, air quality and light pollution. |
| | | | Env-2 | Noise | Level 1 (of 3) | |
| | | | Env-3 | Vibration | Level 1 (of 3) | |
| | | | Env-4 | Air Quality | Level 1 (of 3) | |
| | | | Env-5 | Light Pollution | Level 1 (of 1) | |
| | Resource Efficiency | Resource Efficiency | Rso-1 | Resource Efficiency Strategy and Management | Level 1 (of 3) | Resource efficiency credits require sustainable management of resources and strategies to support it, which can be predominantly achieved at later stages of design and construction. |
| | | | Rso-2 | Contamination and Remediation | Level 1 (of 3) | |
| | | | Rso-3 | Management of Acid Sulfate Soil | Level 0 (of 3) | |
| | | | Rso-4 | Resource Recovery | Level 2 (of 3) | |
| Rso-5 | | | Adaptability | Level 1 (of 3) | | |
| Rso-6 | | | Material Lifecycle Impact Measurement and Reduction | Level 1.5 (of 3) | | |
| Rso-7 | | | Sustainability Labelled Products and Supply Chains | Level 1 (of 3) | | |

| THEME | CATEGORY | CREDIT | NAME | TARGET LEVEL (DESIGN) ¹ | JUSTIFICATION |
|------------------------------|------------------------|--------|--|---|--|
| Environmental Impacts (cont) | Water | Wat-1 | Avoiding Water Use | Level 1 (of 3) | Water category focuses on water efficiency and water reuse, which the project aims to achieve through monitoring and modelling of water use as well as ensuring a proportion of total water use is from non-potable sources. |
| | | Wat-2 | Utilising Appropriate Water Sources | Level 1 (of 3) | |
| | Ecology | Eco-1 | Ecological Assessment and Risk Management | Level 1 (of 3) | The project has already achieved Level 1 for Eco-1 through the EIS work, including the consideration of options to achieve no net loss (through biodiversity offsets) and measures to enhance ecological values. Stakeholder feedback regarding ecological values has also been received and considered. Level 1 of Eco-2 requires ecological monitoring, which is unlikely to occur. |
| | | Eco-2 | Ecological Monitoring | Level 0 (of 3) | |
| Social | Stakeholder Engagement | Sta-1 | Stakeholder Engagement Strategy Development | Level 3 (of 3) | The project has taken several steps to support achievement of the requirements for the maximum level for Sta-1 and Level 2 for Sta-2, including through the development of a well-considered and strategic approach to stakeholder engagement and ensuring stakeholder input influences more than one of the priority project 'negotiables'. |
| | | Sta-2 | Stakeholder Engagement Strategy Implementation | Level 2 (of 3) | |
| | Legacy | Leg-1 | Leaving a Lasting Legacy | Scoped out through IS rating materiality assessment | |
| | Heritage | Her-1 | Heritage Assessment and Monitoring | Level 1 (of 3) | The project is attempting Level 1 for this credit, aiming to maintain heritage values through design. Steps have been taken towards a broad assessment of heritage values, including Indigenous heritage. |

| THEME | CATEGORY | CREDIT | NAME | TARGET LEVEL (DESIGN) ¹ | JUSTIFICATION |
|---------------|--------------------------|--------|---------------------------------|------------------------------------|--|
| Social (cont) | Workforce Sustainability | Wfs-1 | Strategic Workforce Planning | Level 1 (of 3) | Requirements of the credits in this category are to a large extent relevant to the systems and processes at the organisational level. The project may attempt to meet some requirements at a later stage. This may include development of a diversity and inclusion policy and identification of relevant workforce capacity and capability. |
| | | Wfs-2 | Jobs and Skills | Level 0 (of 3) | |
| | | Wfs-3 | Workforce Culture and Wellbeing | Level 0 (of 3) | |
| | | Wfs-4 | Diversity and Inclusion | Level 1 (of 3) | |
| | | Wfs-5 | Sustainable Site Facilities | Level 1 (of 2) | |

24.6 Project uncertainties and approach to design refinements

24.6.1 Project uncertainties

The EIS is based on the current level of design development for the project. Detailed design would include further engineering, construction planning and detailed assessment work, and would be subject to further input from key stakeholders and the community. As such there remains some uncertainty relating to technical requirements and how the project would be constructed. These details would be resolved as the design progresses. The current level of design has been developed for all components of the project.

A summary of the uncertainties around the design, construction and operational methodologies of the project, and how these will be resolved, is provided in Table 24.7.

Table 24.7 Project uncertainties

| CATEGORY | KEY UNCERTAINTY | HOW UNCERTAINTIES WILL BE RESOLVED |
|------------------------|--|---|
| Land use and property | Property acquisition – exact areas that need to be acquired | Refining the amount and location of property acquisition will involve a detailed survey of the project site and surrounding properties, confirmation of the final detailed design for the project and further consultation with the landowners. |
| Waste management | Spoil quantity | Further development of the design will inform the identification of material reuse opportunities and offsite spoiling requirements and volumes. Current estimates are based on the information available at this time. |
| Hydrology and flooding | Drainage within the rail corridor | Flood modelling and drainage design will continue to progress as the design develops with the aim of matching existing conditions as closely as possible. |
| Landscape and visual | Final location of billboards temporarily removed during construction | Following consultation with the landowner and where considered appropriate to construct new billboards, the final siting of billboards will be confirmed during detailed design. Where it is considered appropriate to reinstate a billboard, to minimise potential impacts, as a priority, they will be replaced like for like. Where they cannot be replaced like for like they would be shifted in space to allow like for like placement on a new location in immediate vicinity of their current location. Where they cannot be placed in their immediate vicinity, they may be relocated along the existing rail corridor and combined with existing structures (such as bridges) where practicable. This would aim to minimise introduction of structures in areas where there are minimal structures and infrastructure (ie clustering instead of introducing impacts on higher sensitivity areas). |

| CATEGORY | KEY UNCERTAINTY | HOW UNCERTAINTIES WILL BE RESOLVED |
|---|--|---|
| Contamination | Asbestos contamination west of Robey Street | Limited borehole investigation has been undertaken to the west of Robey Street. Although no ACM has been detected, building/construction waste was recorded. Given the observation of building/construction waste, further asbestos investigation with test pit or trench methods will be carried out in this area during detailed design is in the area west of Robey Street to better inspect the nature of the anthropogenic material recorded and confirm whether asbestos is present. This would inform the understanding of the coverage of existing asbestos contamination within the project site and what management measures may be required. |
| Across a number of potential impact areas | Utilities – impacts on utilities to be defined in detail | Utility investigations are ongoing and will be completed during detailed design, to validate current assessments and confirm relocation/protection requirements. |

24.6.2 Approach to design refinements

The design of the project as described in the EIS would be subject to ongoing refinements during the detailed design phase. Refinements may be made to:

- avoid services that present significant construction difficulties in terms of logistics, time or cost
- reduce the construction timeframe
- avoid areas of environmental sensitivity identified following approval
- reduce impacts on the community
- improve operation without increasing environmental impacts.

Such refinements may include, for example:

- minor changes to the location of construction compounds and work area access
- minor changes to the location of key infrastructure, refinement or reorientation of site boundaries
- minor changes in technology or the features of key project components

For design refinements, a consistency review would be undertaken to consider whether the refinement would:

- result in any of the conditions of approval not being met
- be consistent with the objectives and operation of the project as described in the environmental assessment
- result in a significant change to the approved project
- result in any potential environmental or social impacts of a greater scale or substantially different nature than that considered by the EIS.

A refinement that does not meet these criteria would be considered a design modification. Approval would be sought from the Minister for Planning for any such modifications in accordance with the requirements of Division 5.2 of the EP&A Act.

25. CONCLUSION

This chapter provides the conclusion to the EIS. It summarises the project for which approval is sought; the uncertainties that still exist, how these will be resolved and provides the justification for the project, having regard to biophysical, economic and social considerations.

25.1 Summary description of the project for which approval is sought

ARTC proposes to construct and operate a new second track within the existing Botany Line rail corridor between Mascot and Botany, in the Bayside LGA. The Botany Rail Duplication ('the project') would increase freight rail capacity to and from Port Botany.

The project is State Significant Infrastructure in accordance with Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). As State Significant Infrastructure, the project needs approval from the NSW Minister for Planning and Public Spaces.

This EIS has been prepared to support the application for approval of the project and address the Secretary of the DPIE environmental assessment requirements (the SEARs), issued on 21 December 2018.

25.1.1 Project overview

The project would involve:

- Track duplication – constructing a new track predominantly within the rail corridor for a distance of about three kilometres.
- Track realignment (slewing) and upgrading – moving some sections of track sideways (slewing) and upgrading some sections of track to improve the alignment of both tracks and minimise impacts on adjoining land uses.
- New crossovers – constructing new rail crossovers to maintain and improve access at two locations (totalling four new crossovers).
- Bridge works – constructing new bridge structures at Mill Stream, Southern Cross Drive, O'Riordan Street and Robey Street (adjacent to the existing bridges), and re-constructing the existing bridge structures at Robey Street and O'Riordan Street.
- Embankment/retaining structures – construction of a new embankment and retaining structures adjacent to Qantas Drive between Robey and O'Riordan streets and a new embankment between the Mill Stream and Botany Road bridges.

Ancillary work would include bi-directional signalling upgrades, drainage work and protecting/relocating utilities.

25.1.2 Construction

Subject to approval of the project, construction is planned to start at the end of 2020 and is expected to take about three years for the main construction works to be undertaken. Construction is expected to be completed in late 2023 with commissioning activities undertaken in early 2024.

It is anticipated that some features of the project would be constructed while the existing rail line continues to operate. Other features of the project would need to be constructed during programmed weekend rail possession periods when rail services along the line cease to operate.

Further information on how the project would be constructed is provided in Chapter 7 (Construction).

25.1.3 Operation

The project would operate as part of the existing Botany Line and would continue to be managed by ARTC. ARTC is not responsible for the operation of rolling stock. Train services are currently, and would continue to be, provided by a variety of operators. Following the completion of works, the existing functionality of surrounding infrastructure would be restored.

It is estimated that once the project is operational, there would be an increase in freight train movements from 40 to 90 per day by 2030.

Further information on operation is provided in Chapter 6 (Project features and operation).

25.2 Justification of the project

25.2.1 Summary of project justification

Port Botany is one of Australia's and NSW's most important infrastructure assets. It is the largest container port in Australia and NSW's largest bulk liquid and gas port.

Efficient access to Port Botany is critical to the economic growth and prosperity of Sydney. Over the next 20 years, container freight, air freight, air travel and general traffic in and around the Port Botany and Sydney Airport area are expected to grow significantly.

The existing rail line is currently operating close to capacity. ARTC undertook a capacity analysis of the Botany Line as part of the Sydney Metropolitan Freight Strategy 2015–2024 (ARTC 2015). Based on the predicted growth at the time (2014), it was concluded that the Botany Line would reach capacity by 2022. The existing bidirectional single track section between Mascot and Botany acts as a constraint to the movement of trains along the line. Additional demand arising from the predicted growth in container freight has the potential to create a bottleneck along this line, impacting on reliability and restricting the efficient movement of freight across the broader Sydney rail network.

As Sydney's primary container port, it is vital that Port Botany maintains the capacity to meet freight demands over the long term. The project is needed to support improved rail connections to Port Botany and enable more freight to be moved by rail. One freight train equates to about 54 trucks. As a result, the project is a vital part of the solution to reduce congestion on the roads around Port Botany and Sydney Airport.

25.2.2 Summary of project benefits

The project is one of a number of initiatives proposed to improve freight rail transport from Port Botany through the Sydney Metropolitan Freight Network in response to a growing economy and policy objectives to increase the rail modal share for container freight.

The primary objective of the project is to increase the capacity of the freight rail network to meet the forecast demand for container freight transport along the Botany Rail Line.

Other expected benefits of the Botany Rail Duplication project would include:

- supporting connection to, and operation of, current and future metropolitan intermodal terminals, including Enfield, Chullora and Moorebank
- encouraging a shift in freight transport from road to rail, and supporting a reduced rate of growth in truck movements and associated traffic congestion around Sydney Airport and Port Botany
- providing capacity for freight traffic accessing and exiting Port Botany well beyond 2030
- enabling efficient train paths and speeds delivering increased service reliability and productivity to freight rail customers
- improving rail market share
- reducing environmental and other road related externalities.

25.2.3 Consequences of not proceeding

Without the project, there would not be sufficient capacity to provide for the predicted growth in rail freight in Sydney, particularly to and from Port Botany. A shift in freight transport from road to rail, which may reduce the rate of growth in truck movements and associated traffic congestion, would not be supported.

25.2.4 Environmental considerations

Environmental investigations were undertaken during preparation of the EIS to assess the potential impacts of the project. These included specialist assessments of traffic, transport and access, noise and vibration, air quality, biodiversity, soils and contamination, hydrology and flooding, surface water quality and groundwater, Aboriginal and non-Aboriginal heritage, landscape and visual amenity, hazards and risks, social and health impacts and climate change. The EIS has documented the potential environmental impacts, considering both potential positive and negative impacts, and identifies mitigation measures (compiled in section 24.3) to protect the environment where required.

The key potential impacts on the biophysical, social and cultural environments are summarised in section 25.2.4.

As described in section 24.2, the project would incorporate environmental management and design features to ensure that potential impacts are managed and mitigated as far as practicable.

25.2.5 Ecologically sustainable development

The EP&A Act adopts the definition of ecologically sustainable development contained in the *Protection of the Environment Administration Act 1991*. An assessment of the project against the principles of ecologically sustainable development as per clause 7(4) of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* is provided below.

Precautionary principle

A range of environmental investigations, as described in Part B of the EIS, have been undertaken during the development of the project and the environmental assessment process, to ensure that potential impacts are understood with a high degree of certainty. The assessment of the potential impacts of the project is considered to be consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific and assessment methodologies, and have taken into account relevant statutory and agency requirements. The assessments have applied a conservative approach with regard to construction and operational arrangements, and the modelling used.

The project has evolved to avoid impacts where possible and to reflect the findings of the studies undertaken.

Examples of the application of the precautionary principle include the biodiversity assessment and the noise and vibration assessment. A population of the Green and Golden Bell Frog (*Litoria aurea*) previously occurred at the Botany Wetlands, which are crossed by the project at Mill Stream. A detailed survey and assessment of the species was carried out even though the Green and Golden Bell Frog has not been recorded at Botany Wetland since 1993.

The noise and vibration assessment involved a 'worst case' construction noise impact assessment, even though the likelihood of the worst-case is considered to be low and therefore potential noise impacts are considered to be lower than assessment.

A number of safeguards have been proposed to minimise potential impacts. These safeguards would be implemented during construction and operation. No safeguards have been postponed as a result of lack of scientific certainty.

Principle of inter-generational equity

Construction has the potential for some degree of environmental and social disturbance. These disturbances include the clearing of vegetation, amenity impacts during construction and changes to traffic movements and access. However, the potential for environmental and social disturbance as a result of construction has to be balanced against the long term benefits of the project in terms of rail freight transport.

The project would benefit future generations by ensuring that it does not give rise to long term adverse impacts on the environment and potential impacts would be minimised by implementation of appropriate safeguards. This would ensure that the principle of intergenerational equity is not compromised.

Should the project not proceed, the principle of intergenerational equity may be compromised, as future generations would experience the increased environmental and safety impacts associated with the transport of large volumes of freight via road. The strategic planning studies summarised in Appendix E, have identified a strong need and justification for freight rail transport. As a result, the project would benefit future generations by providing a safer, more efficient, means of freight transport.

Conservation of biological diversity and ecological integrity

The study area has been previously highly modified and the landscape fragmented as a result of construction of infrastructure such as the Botany Line, roads, Sydney Airport and urban settlement.

The majority of the project site is located within the existing rail corridor within an industrial area of Sydney, which has been cleared and substantially modified through previous earthworks and construction. The project's impacts are substantially less than would be associated with an undisturbed 'green field' site. The project has been purposefully designed to avoid or further reduce impacts on biodiversity values as far as is practicable, through the use of cleared and disturbed compound sites where possible.

Ecological studies have been undertaken to identify potential adverse impacts on biodiversity. Where potential impacts cannot be avoided, mitigation measures would be implemented to reduce the impact as far as possible.

The project would result in the removal of a small area of native vegetation and fauna habitat. The majority of this comprises riparian vegetation alongside Mill Stream, Mill Pond and New Pond which would be removed for construction of the bridge and compound site. Following construction, disturbed areas would be stabilised and revegetated using locally endemic species typical of riparian areas. Mitigation measures are proposed to minimise and manage the significance of the impact on native vegetation and flora and fauna.

Improved valuation and pricing of environmental resources

As described in sections 6.1.2 and 7.1.1, design development and construction planning has included a focus on avoiding or minimising the potential for environmental impacts during all key phases of the process. In addition, the assessment has identified the environmental and other consequences of the project, as well as mitigation measures where appropriate to manage potential impacts. If approved, the construction and operation of the project would be in accordance with relevant legislation, the conditions of approval and environmental management plans for construction and operation. These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the project. This signifies that environmental resources have been given appropriate valuation.

The concept design for the project has been developed with an objective of minimising potential impacts on the surrounding environment. This indicates that the concept design has been developed with an environmental objective in mind.

25.3 Concluding statement

ARTC proposes to construct and operate a new second track within the existing Botany Line rail corridor between Mascot and Botany, in the Bayside LGA. The Botany Rail Duplication project would increase freight rail capacity to and from Port Botany.

Potential impacts resulting from the project are considered manageable through the implementation of the proposed mitigation measures.

The detailed design for the project would be developed with the objective of minimising potential impacts on the local and regional environment, and the local community. The design and construction methodology would continue to be developed with this overriding objective in mind, taking into account the input of stakeholders.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during construction and operation of the project. Chapter 24 (Approach to environment management and mitigation) summarises the mitigation measures that would be implemented. The environmental performance of the project would be managed by the implementation of the Site EMPs, CEMP and ARTC's environmental management system. This would also ensure compliance with relevant legislation and any conditions of approval.

With the implementation of the proposed mitigation and management measures the potential environmental impacts of the project would be adequately managed. Overall, the project is expected to result in long term benefits to local and Greater Sydney communities. These relate to increased rail freight efficiency and capacity across the regional and national freight network and less congestion on the road due to reduced freight movements made by trucks.

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