Transport for NSW/Sydney Airport Corporation Limited

Sydney Gateway Road Project

Major Development Plan

Refinements and Clarifications

Section 2 Updated mitigation measures

2020

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2. Mitigation measures

The EIS/MDP identified the proposed approach to environmental management and the mitigation measures that would be adopted to avoid or reduce the potential impacts of the project. These measures are summarised in section 27.3 of the EIS/MDP.

After consideration of the issues raised in submissions, the mitigation measures have been updated to:

- Make additional commitments based on design refinements and the findings of further assessments as described in section 1
- Make additional commitments to response to issues raised in the submissions
- Modify the wording so that the intent of the measure is clearer.

Where new measures have been added or new text has been added to an existing measure, it appears as **red bold text**. Where a measure has been deleted or text has been deleted, it appears as ~~strikethrough~~ text.

Table 2.1 to Table 2.3 provide a compilation of the measures proposed to mitigate and manage the potential impacts of the project. Table 2.1 provides those measures relevant to the design of the project, which would be implemented as part of the detailed design stage to guide how the project is designed. Table 2.2 provides those measures relevant to construction, including construction planning and the development of the recommended strategies and plans that would be implemented during construction – some of which would be developed pre-construction. Table 2.3 provides those measures relevant to operation, which would be implemented during the operational stage and would guide how the project is operated and maintained in the long-term.

The measures are broadly grouped according to the main stage of implementation and apply to an issue or impact rather than specific jurisdictions (land subject to either the Airports Act or EP&A Act). It is noted that the implementation of some measures may occur across a number of stages. The majority of measures will apply to the project as a whole (ie to those elements of the project that are located on Sydney Airport land as well as those located on land subject to the EP&A Act). The exceptions to this are those measures that relate to specific features such as Alexandra Canal and the former Tempe landfill.

Table 2.1 Compilation of mitigation measures for detailed design

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
Noise and vibration			
NV3	NV1	*Potential operational noise impacts*	An operational noise mitigation strategy will be developed and implemented as part of the design, including investigating the need for low noise pavements, noise barriers and at-property mitigation.
NV14	NV2	*Noise impacts due to ground-based airport activities*	Investigate reasonable and feasible options to reduce the propagation of noise from ground-based airport activities following removal of buildings as part of the project. This will include options to retain screening provided by existing buildings.
NV15	NV3	*Operational noise and vibration impacts of the project*	Operational noise and vibration mitigation measures will be identified during detailed design. Requirements for at-property noise treatments in properties identified as 'eligible' in the noise and vibration assessment will be reviewed. The implementation of treatments will be undertaken in accordance with the *At-Receiver Noise Treatment Guideline* (Roads and Maritime, 2017).
NV16	NV4	*Cumulative noise impacts with the Botany Rail Duplication project*	**Reasonable and feasible noise mitigation for receivers affected by operational noise from both the Botany Rail Duplication and the Sydney Gateway road project would be considered in consultation with ARTC.**

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
Airport operations			
AS1	AS1	*Windshear and turbulence*	The road infrastructure and final landforms (including the emplacement mounds~~s~~) will be reviewed and refined during detailed design to: ■ Address aviation matters ■ Minimise the volume of material excavated from the former Tempe landfill ■ Maximise open space and community use opportunities ■ Avoid disturbance outside the project boundary. **Any changes to road infrastructure and final landforms will reviewed with consideration of the *National Airports Safeguarding Framework* (Guideline B) (DITCRD), 2018), and in consultation with Sydney Airport Corporation and relevant aviation regulatory agencies.** ~~To achieve the above requirements, alternative mound locations, heights and shapes will be considered. With respect to aviation, Any changes to road infrastructure and final landforms will be assessed in relevant wind directions, in accordance with the *National Airports Safeguarding Framework* (Guideline B), to identify an optimal design.~~ ~~The optimisation process will address Sydney Airport operational requirements, and will occur in consultation with Sydney Airport Corporation, aviation stakeholders, and Australian, NSW and local government agencies.~~
AS2	AS2	*Runway public safety areas*	A risk assessment in accordance with the principle of 'as low as reasonably practicable' (ALARP) will be undertaken to confirm the risk associated with operating the project within the public safety area to the north of the main north–south runway. The assessment will include consideration of the *National Airports Safeguarding Framework* (Guideline I) (DITCRD, 2018). The results of the assessment will inform the design of the project.
AS3	AS3	*Permanent intrusions of Sydney Airport's prescribed airspace*	The project will continue to be designed to avoid intrusions of Sydney Airport's prescribed airspace by permanent project infrastructure.
AS4	AS4	*Wildlife attraction*	All drainage and flood management infrastructure (including the flood mitigation basin) will be designed in accordance with Sydney Airport's Wildlife Management Plan to minimise the risk of attracting wildlife. Appropriate measures will be developed and implemented, including designing the infrastructure to ensure that water does not pond for more than five days **(unless other suitable measures to minimise a the risk of attracting wildlife are in place).**
AS5	AS5		The urban design and landscape plan for the project will include consideration of appropriate landscape designs and species lists to minimise opportunities to attract wildlife at levels likely to present a hazard to aviation operations. The plan will have regard to relevant requirements and species lists under Sydney Airport's Wildlife Management Plan and other relevant guidelines, including the *National Airports Safeguarding Framework* (Guideline C) (DITCRD, 2018) and *Recommended Practices No. 1 – Standards for Aerodrome Bird/Wildlife Control* (International Birdstrike Committee, 2006).

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
AS6	AS6	*Pilot distraction as a result of street lighting and headlight glare*	Lighting will continue to be designed in accordance with *AS/NZS 1158.1.1:2005 Lighting for roads and public spaces Part 1.1: Vehicular traffic (Category V) lighting – Performance and design requirements.*
AS7	AS7		The project will continue to be designed to minimise the risk of headlight glare and pilot distraction. This will include providing glare screens in those locations where there is an unacceptable risk of pilot distraction.
AS8	AS8	*Interference with communication, navigation and surveillance equipment*	The detailed design will be referred to Airservices Australia to confirm that there will be no impacts to navigations aids, communications or surveillance equipment.
AS9	AS9		The utilities contingency management plan (measure HS2) will include measures to respond to any unplanned outages of services to critical Sydney Airport infrastructure, including navigations aids, communications and surveillance equipment.
Air quality			
AQ2	AQ1	*Avoiding odour impacts*	**The** detailed design **of the project** will seek to minimise **the need to expose waste** at the former Tempe landfill **in order to eliminate potential odour issues during construction.** ~~by:~~ ■ ~~the need to expose waste, and/or the area exposed at any one time.~~ ■ ~~Where there is the potential to generate odour, managing this in accordance with the odour management strategy.~~
Contamination and soils			
CS1	CS1	*Investigation of data gaps and potential for unidentified asbestos containing materials*	Additional soil and groundwater investigations will be undertaken to inform detailed design, construction planning, and preparation of remediation action plan(s) (RAP(s)). The investigations will include: ■ Further characterising the existing contamination status of the project site, including the potential for unidentified asbestos containing materials ■ Groundwater investigations for all assessment areas and any indirectly affected areas ■ Soil and groundwater testing to address data gaps for land north of the rail corridor and Sydney Airport land.
CS2	CS2	*High salinity potential*	Soil salinity will be considered in the design of subsurface structures.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
CS3	CS3	*Management of contaminated sites*	Where the project has the potential to affect the remediation systems in the former Tempe landfill and Sydney Airport northern lands car park, the controls and protocols outlined in the existing EMP will be implemented such that the systems continue to operate effectively during operation. A RAP (or multiple RAPs) will be prepared (as required) to describe the remediation strategy to be implemented to ensure that existing contamination does not pose a future risk to human health or the environment during operation. The RAP(s) will be prepared by a suitably qualified and experienced consultant, as defined in Schedule B9 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999*. The RAP(s) will be prepared and implemented in accordance with the following requirements: ■ The **objectives of the** voluntary remediation proposal and EMP ~~and any RAPs in place for the former Tempe landfill~~ ■ The requirements of the existing Sydney Airport RAP and EMP (if applicable) ■ *National Environment Protection (Assessment of Site Contamination) Measure 1999* ■ Airports (Environment Protection) Regulations 1997 (for Sydney Airport land) ■ *Environmental Guidelines: Solid waste landfills* (NSW EPA, 2016) (for ~~reinstatement of the capping layer and/or design of the new capping layer and final road pavement at~~ the former Tempe landfill) ■ ***Contaminated Land Guidelines: Assessment and management of hazardous ground gases* (NSW EPA, 2019).** The RAP(s) will be: ■ Prepared in consultation with the Airport Environmental Officer **(in relation to the airport site) and Inner West Council** ~~and NSW EPA (as relevant~~**in relation to the former Tempe landfill**) ■ For works on land subject to the EP&A Act – approved by a **NSW EPA-accredited** ~~n independent~~ site auditor ~~accredited under the site auditor scheme under the CLM Act~~ ■ For works on Sydney Airport land – approved by Sydney Airport Corporation and endorsed by the Airport Environment Officer. If Sydney Airport Corporation and/or the Airport Environment Officer consider a site assessor is required, the site assessor will be nominated by the Secretary (as defined by Regulation 6.10 of the Airports (Environment Protection) Regulations 1997) and will endorse the RAP(s).
CS8	CS4	*Impacts on the former Tempe landfill*	An assessment will be undertaken of the potential hazards associated with landfill gas during construction and operation. The assessment will consider the potential for ingress and build-up of gases that may pose a risk to safety. Where the need for measures to manage landfill gases post-construction is identified, such measures will be described in the RAP(s) (measure CS3) **which will be developed in accordance with the *Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases* (NSW EPA, 2019).** ~~Measures could include the design and installation of a landfill gas management system to provide a preferential flow path for landfill gas below the road infrastructure and emplacement mounds.~~

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
CS9	CS5		A settlement and slope stability analysis will be undertaken to ensure that the emplacement mound~~s~~ are designed to suitable engineering standards such that the long-term stability of the capping layer is maintained. The design and construction of the emplacement mound~~s~~ will be described in the RAP(s) (measure CS3) and will be in accordance with *Environmental Guidelines: Solid waste landfills* (NSW EPA, 2016). The design will be prepared in consultation with **a** ~~the~~ NSW EPA-**accredited site auditor**.
CS10	CS6		The location of all existing landfill management infrastructure, including the bentonite wall, leachate collection system and passive gas collection system, will be confirmed and (if required) the design will be further refined to avoid impacts on this infrastructure. Measures will be developed, and included in the RAP (if required) to protect the landfill management infrastructure during construction, or reinstate the infrastructure such that it continues to operate effectively after construction is finished.
CS11	CS7	*Protection of adjacent infrastructure*	**A geotechnical assessment will be undertaken to determine the loading that the active transport link has on the Sydney desalination pipeline and the walls of Alexandra Canal. Appropriate mitigation will be implemented for any identified impacts.**
Flooding			
HF1	HF1	*Management of the potential for flooding impacts during construction*	A flood mitigation strategy will be prepared and relevant measures will be implemented as part of the design and during construction. The strategy will include undertaking additional flood modelling taking into account detailed design and proposed construction planning and methodologies. **The flood mitigation strategy will be prepared in consultation with Sydney Airport Corporation, Sydney Water, NSW State Emergency Services and relevant councils.**
HF2	HF2	*Impacts on flood behaviour from construction*	Hydrologic and hydraulic assessments will be carried out for all temporary and permanent project components (including ancillary facilities) that have the potential to affect flood levels in the vicinity of the project. The results of the assessment will inform the preparation of the flood mitigation strategy (measure HF1) as well as the design of temporary construction facilities and design development.
HF3	HF3	*Impacts on property*	Where flood levels in the one per cent AEP event are predicted to increase at any residential, commercial and/or industrial buildings as a result of construction or operation of the project, a floor level survey will be carried out. If the survey indicates existing buildings would experience above floor inundation during a one per cent AEP event **as a result of the project**, further refinements will be made (as required) to the design of temporary and permanent project components to minimise the potential for impacts.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
HF4	HF4	*Impacts on drainage systems*	Further modelling will be undertaken based on the detailed design to determine the ability of the receiving drainage systems to effectively convey drainage discharges from the project once operational. The modelling will be undertaken in consultation with Sydney Airport Corporation and relevant council(s). It will include, but not be limited to: ■ Confirming the location, size and capacity of all receiving drainage systems affected by operation ■ Assessing the potential impacts of drainage discharges from the project drainage systems on the receiving drainage systems ■ Identifying all feasible and reasonable mitigation measures to be implemented where drainage from the project is predicted to adversely impact on the receiving drainage systems.
HF5	HF5	*Potential impacts of climate change on flooding*	The potential impacts of climate change on flooding behaviour will be considered during further modelling, in accordance with the procedures set out in *Floodplain Risk Management Guideline: Practical Considerations of Climate Change* (DECC, 2007) and *Australian Rainfall and Runoff* (Geoscience Australia, 2019) **and in consultation with the directly affected landowners**. An approach to integrating the identified effects into the design and operation of the infrastructure will be determined and implemented.
Groundwater			
GW1	GW1	*Avoiding impacts on groundwater*	Detailed design and construction planning will seek to minimise impacts on groundwater by: ■ Avoiding the need to extract groundwater ■ Minimising groundwater inflows and volumes into excavations.
GW2	GW2	*Settlement of unconsolidated sediments*	Modelling of settlement induced by groundwater drawdown will be undertaken in accordance with relevant guidelines, based on detailed geotechnical information obtained from the site investigations and the proposed construction approach. Should modelling identify any settlement issues, measures to reduce settlement will be confirmed.
GW3	GW3	*Impacts on existing groundwater well*	A survey of GW024036 will be undertaken to confirm the use of this bore. If this bore is in use, alternative water sources will be considered to ensure ongoing water supply as required.
Surface water			
SW1	SW1	*Sedimentation and scour protection at Alexandra Canal*	The potential for scour at bridge abutments will be considered for flow events up to and including the one per cent annual exceedance probability event. Scour protection will be included in the detailed design as required.
SW2	SW2		Discharge outlets will be designed with appropriate energy dissipation and scour protection measures to minimise the potential for scour. Scour protection will be developed in consultation with relevant stakeholders, including Sydney Water.
SW4	SW3	*Water sensitive urban design*	Appropriate treatment measures, including water sensitive urban design, will be considered in the detailed design with the aim of improving water quality within Alexandra Canal and/or achieving the targets outlined in the *Botany Bay and Catchment Water Quality Improvement Plan* (SMCMA, 2011).

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
SW5	SW4		Surface water drains and associated infrastructure will be designed to prevent scour of soil, erosion and associated sedimentation impacts.
Non-Aboriginal heritage			
NAH1	NAH1	*Avoiding impacts on heritage*	The design will avoid impacts on non-Aboriginal heritage items, significant heritage fabric, locally and State significant archaeological remains and landscapes (including mature trees) as far as reasonably practicable. This includes significant fabric associated with Alexandra Canal and the Sydney (Kingsford Smith) Airport Group.
NAH2	NAH2	*Minimising impacts on heritage*	The design will be prepared in accordance with the urban design and landscape plan **and Statement of Heritage Impact** for the project. The design will minimise the potential for visual impacts on heritage items by incorporating sympathetic fabric, colour and form in the design.
NAH3	NAH3	*Design of the bridges over Alexandra Canal*	The bridges over Alexandra Canal will be designed to: ■ Be sympathetic to the heritage sensitivity and industrial landscape of the canal ■ Minimise physical impacts on the canal ■ Incorporate a high quality architectural design using suitable material and forms ■ Integrate with the bridges for the New M5 ■ Retain the open character of the canal as far as possible ■ Have regard to the Alexandra Canal Conservation Management Plan. **Appropriately qualified and experienced heritage design professionals will be involved in the development of the designs for the bridges over Alexandra Canal. The proposed designs, including the elements of heritage interpretation incorporated into the designs, will be presented to the Heritage Council of NSW and Sydney Water. Feedback from the Heritage Council of NSW and Sydney Water will be considered and adopted in the designs where reasonable and feasible.** ~~An appropriately qualified and experienced heritage architect or engineer will provide independent review of the designs, and the Heritage Council of NSW and Sydney Water will be consulted.~~
NAH4	NAH4	*Design of the drainage outlets at Alexandra Canal*	The drainage outlets at Alexandra Canal will be designed to: ■ Minimise impacts on significant original fabric and highly visible areas ■ Be sympathetic to the industrial landscape of the canal and its existing fabric ■ Use suitable material and forms ■ Have regard to the Alexandra Canal Conservation Management Plan. An appropriately qualified and experienced heritage architect or engineer will provide independent review of the designs, and the Heritage Council of NSW and Sydney Water will be consulted.
NAH5	NAH5	*Reuse of significant fabric at Alexandra Canal*	Where significant fabric is to be removed, consideration will be given to reusing the fabric for interpretation or repair and maintenance of other sections of the canal, in consultation with Sydney Water.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
NAH6	NAH6	*Heritage interpretation*	Appropriate heritage interpretation will be incorporated into the design in accordance with the *NSW Heritage Manual* (NSW Heritage Office and Department of Urban Affairs and Planning, 1996), *Interpreting Heritage Places and Items: Guidelines* (NSW Heritage Office, 2005), and the NSW Heritage Council's Heritage Interpretation Policy. This will focus on recognising the historical significance of the following items: ■ Alexandra Canal ■ Sydney (Kingsford Smith) Airport Group ■ Cooks River Container Terminal ■ Mascot (Shea's Ck) Underbridge ■ Botany Rail Line. **Elements of heritage interpretation that will be incorporated into the design will be described in the urban design and landscape plan.**
Aboriginal heritage			
AH1	AH1	*Archaeological investigation areas impacted by the project*	Detailed design and construction planning will avoid direct impacts on Investigation Area 1 and Investigation Area 2 where practicable.
AH3	AH2	*Aboriginal heritage interpretation*	An Aboriginal heritage interpretation strategy will be developed in consultation with registered Aboriginal parties and other relevant stakeholders. The interpretation strategy will have regard to *Sydney Airport Master Plan 2039* and the Sydney Airport Heritage Management Plan. Appropriate Aboriginal heritage interpretation will be incorporated into the project design in accordance with the interpretation strategy.
Land use and property			
LU1	LU1	*Impacts on property and land use*	The design will continue to be refined to minimise land requirements and potential impacts on existing land uses and properties as far as possible. Consultation with landholders will be ongoing to identify opportunities to minimise impacts on onsite operations where practicable.
LU2	LU2	*Impacts on advertising structures*	The approach to mitigating impacts on advertising structures (including adjusting, relocating or providing new structures at locations along project infrastructure) will be confirmed during detailed design.
LU3	LU3	*Use of residual land*	**Transport** ~~Roads and Maritime~~ will continue to consult with Inner West Council regarding the future use of residual land in the Tempe Lands and adjoining area. This will include opportunities for open space and recreation uses, and provision for a new off-leash dog exercise area and council depot. **Transport** ~~Roads and Maritime~~ will support and assist Inner West Council with the master planning process for these areas as appropriate, and will ensure that the urban design and landscape plan for the project is consistent with the outcomes of this process.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
LU4	LU4	*Impacts on utilities*	The location of all utilities, services and other infrastructure will be identified prior to construction to determine requirements for access to, diversion, protection and/or support. This will include (as required), undertaking utilities investigations, including intrusive investigations, and consultation and agreement with service providers.
Socio-economic			
SE3	SE1	*Permanent land requirements at Tempe Lands*	**Transport** ~~Roads and Maritime~~ will continue to consult with Inner West Council to ensure: ■ Impacts on open space and recreational facilities in Tempe Lands will be offset ■ Consistency between the project's urban design and landscape plan and Council's master plan for Tempe Lands.
SE4	SE2	*Safety of active transport links*	Temporary and operational active transport links will be designed ~~to ensure the safety of the users~~ in accordance with crime prevention through environmental design principles.
Landscape character and visual amenity			
LV1	LV1	*General visual impacts*	An urban design and landscape plan will be prepared to provide a consistent approach to project design and landscaping.
LV2	LV2		Further design refinements of structures including bridges and the Terminals 2/3 access viaduct will be undertaken to minimise visual impacts as far as possible.
N/A	LV3	*Urban design*	**The Director for the Centre for Urban Design at Transport will convene and facilitate an urban design review panel. The panel will comprise the Government Architect, Director Bridges Technical Services (Transport), and an urban design-qualified representative from Sydney Airport Corporation.**
LV3	LV4	*Managing the loss of trees*	**The need to remove trees within the project site will be avoided where practicable. For those trees that cannot be reasonably avoided,** a tree management strategy will be developed, including measures to offset the loss of trees and achieve a net increase in tree canopy. The final location of replacement trees will be confirmed in consultation with Inner West Council and Sydney Airport Corporation. The strategy will also include on-site processes and protective measures to ensure trees identified for retention are appropriately protected during construction.
LV4	LV5	*Noise barriers*	Where feasible and reasonable, the proposed noise barrier in the Tempe Lands will be designed to provide new active transport connectivity across the Terminal 1 connection and between the western and eastern portions of open space, and maximise passive surveillance of open space from the road.
LV5	LV6		Noise barriers will be designed to minimise their visual prominence as much as possible.
LV6	LV7	*Minimising light spill*	Lighting for the project will be designed in accordance with *AS 4282 Control of the Obtrusive Effects of Outdoor Lighting*. Lighting will be designed to minimise glare and light spill into adjoining areas.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
Biodiversity			
BD1	BD1	*Avoiding impacts on biodiversity*	Detailed design will avoid or minimise the need to remove and/or disturb native vegetation and fauna habitat, including impacts on mapped areas of mangrove forest and Tempe Wetlands.
BD2	BD2		Vegetation clearing will be limited to the minimum necessary to construct the project. Micro-siting of infrastructure will be undertaken during detailed design to further minimise or avoid impacts on native vegetation where practicable. Exclusion areas will be established and maintained around any native vegetation adjoining the project site **to be retained** in close proximity to work locations ~~to be retained~~.
Waste management			
WM1	WM1	*Waste generation and recycling*	Detailed design will include measures to minimise excess spoil generation. This will include a focus on optimising the design to minimise spoil volumes, and the reuse of material on site.
Sustainability			
SU1	SU1	*Achieving the target sustainability rating*	A sustainability management plan will be developed to ensure that sustainability considerations are implemented during the detailed design, construction and operation phases of the project. The plan will include project-specific sustainability initiatives and implementation protocols to support achievement of the project's target excellent 'Design' and 'As Built' rating under the Infrastructure Sustainability rating tool (v1.2) and to ensure ongoing consistency with the *Environmental Sustainability Strategy 2019–2023* (Roads and Maritime, 2019)
Climate change and greenhouse gas			
CC1	CC1	*Climate change risk assessment*	A detailed climate change risk assessment, considering both direct and indirect risks, will be undertaken during detailed design in accordance with *AS 5334-2013 Climate change adaptation for settlements and infrastructure – A risk based approach* and the draft *Technical Guide: Climate Change Adaptation for the Road Network* (Roads and Maritime, 2015c). Adaptation measures will be confirmed and actions implemented to address extreme and high risks where reasonable and feasible. Adaptation measures for medium risks will be considered and implemented where reasonable and feasible. Progress against implementation of confirmed adaptation measures and actions will be tracked. The assessment will include further modelling to optimise the design and reduce the impacts of climate change scenarios.
CC2	CC2	*Climate change related flood risks*	The flood mitigation strategy (measure HF1) will include consideration of future climate change related flood risks, the potential impacts of future climate change on flooding, and adaptive measures for implementation.
CC3	CC3	*Urban heat island effect*	The urban design and landscape plan for the project will include consideration of appropriate landscape designs and species to reduce the impacts of urban heat island effect. Other measures to mitigate the impacts of the urban heat island effect will be investigated during detailed design and included in the urban design and landscape plan. Measures **could** ~~will~~ include using light coloured pavements and shading structures for public spaces.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – detailed design
GHG1	GHG1	*Greenhouse gas emissions*	The sustainability management plan (measure SU1) will include measures and targets to reduce greenhouse gas emissions during construction and operation. The plan will include targets to reduce the project's carbon footprint during construction and operation considering scope 1, scope 2 and scope 3 emissions.
GHG2	GHG2		The final design will incorporate LED lighting in preference to fluorescent fittings or high-pressure sodium lights where fit for purpose, feasible and cost-effective.
GHG3	GHG3		The surface road network will be designed for long term performance and durability of materials, increasing asset design lives and reducing the frequency of maintenance activities.

Table 2.2 Compilation of mitigation measures for construction

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
Environmental management			
EM1	EM1	*Construction environmental management*	A CEMP will be prepared to detail the approach to environmental management during construction~~, as described in section 27.2.1~~ and in accordance with the conditions of approval.
Traffic, transport and access			
TT1	TT1	*Potential for traffic, transport and access impacts during construction*	A Construction Traffic and Access Management Plan will be prepared prior to construction and implemented as part of the CEMP. The plan will detail processes and responsibilities to minimise traffic and access delays and disruptions, and identify and respond to changes in road safety during construction.
TT2	TT2		The Construction Traffic and Access Management Plan will include proposed road staging of construction works along Airport Drive, Qantas Drive and key accesses to Sydney Airport's terminals to ensure these key roads maintain satisfactory capacity and minimum levels of service. ~~The proposed road staging plans and mitigation measures will be developed in conjunction with Transport for NSW (various divisions), ARTC, the Transport Management Centre, Sydney Coordination Office, Sydney Airport Corporation, emergency services, and any contractors working in the vicinity of the airport.~~
TT3	TT3		The communications strategy (measure SE3) will include a mechanism to inform the community of the dates and durations of specific phases within the project, including information about specific lane and road closures and the times of day and night when works will be carried out.
TT4	TT4	*Alternative transport modes*	A travel demand management strategy will be prepared to provide: ▪ A comprehensive set of travel mode options to minimise use of roads affected by construction ▪ Communication strategies to reduce the number of people using the road network in the project study area during construction, where practicable.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
TT5	TT5	*Impacts on road network performance (delays) and safety*	Construction staging and temporary work plans will be prepared to: ■ Ensure access to Sydney Airport is maintained at all times during operational hours ■ Stage the construction works on key parts of the network, such as Qantas Drive, Airport Drive and access to Sydney Airport terminals, to enable these roads to continue to function with as minimal impact as possible ■ Minimise conflict with the existing road network ■ Maximise spatial separation between work areas and travel lanes. **The proposed road staging plans and mitigation measures will be developed in consultation with the Airport Precinct Infrastructure Coordination Operations Group and the Traffic and Transport Liaison Group comprising representatives from Transport for NSW (various divisions), ARTC, the Transport Management Centre, Sydney Coordination Office, Sydney Airport Corporation, emergency services, and any contractors working in the vicinity of the airport.**
TT6	TT6		Further consideration of the construction phase road geometry and construction area operations will be undertaken with the aim of optimising road performance during construction. This will include the following considerations: ■ Maintain a posted speed of 50 to 60 km/h along the construction zones ■ Maintain three lanes in each direction at the Airport Drive and Link Road intersection ■ Provide three lanes into Terminals 2/3 at Sir Reginald Ansett Drive through to Keith Smith Avenue.
TT7	TT7		Where reasonable and feasible, work areas, activities and construction access arrangements will be modified to address any traffic flow issues identified by key stakeholders, including the Sydney Coordination Office, Sydney Airport Corporation and the Transport Management Centre.
TT8	TT8		A mechanism will be provided for the community to report incidents and delays, such as a project phone number. The contact mechanism will be communicated in accordance with the project's communication strategy (measure SE3).
TT9	TT9	*Impacts on access to Terminals 2/3*	Further traffic management in the vicinity of the Qantas Drive/Seventh Street/Robey Street intersection will be planned and undertaken with consideration of the following potential re-routing options: ■ Divert westbound traffic from General Holmes Drive (via Joyce Drive) onto Robey Street (via the new Wentworth Avenue link provided by the Airport East Upgrade project) and Botany Road instead of using the right turn from Qantas Drive to Robey Street ■ Consolidate and support the function of the left turn from Qantas Drive onto Robey Street and traffic out of Seventh Street through the re-allocation of signal green time taken away from the diverted or banned right turn movement (from Qantas Drive to Robey Street) during peak periods or potentially ban the right turn movement in the peak periods ■ Introduce an additional left turn lane into Robey Street from Qantas Drive to improve traffic flows based on traffic modelling analyses.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
TT10	TT10		Access to Sydney Airport will be maintained at all times during the airport's operational hours. Any temporary changes in access arrangements will be developed, communicated and implemented in consultation with Sydney Airport Corporation.
TT11	TT11	*Property, cyclist and pedestrian access*	Access to properties, including residences, businesses and community infrastructure, will be maintained. Where disruption to access cannot be avoided, consultation will be undertaken with the owners and occupants of affected properties, to confirm their access requirements and to determine alternative arrangements.
TT12	TT12		Safe pedestrian and cyclist access will be maintained around or through work areas. Where disruption to access cannot be avoided, alternative routes that comply with relevant accessibility standards and guidelines will be provided, signposted and communicated.
TT13	TT13	*Impacts on the availability of parking on streets surrounding construction work areas*	A worker parking strategy will be developed to identify measures to minimise worker parking on local streets. Measures to be implemented during construction will include provision of designated parking areas within the project site, encourage use of public transport and implement shuttle bus arrangements.
TT14	TT14	*Impacts on bus stops and passengers*	Where required, changes to existing bus stops and/or changes to bus service patterns will be undertaken in accordance with the following requirements: ■ Changes will be designed and implemented in consultation with Transport NSW and bus operators ■ The community will be informed in advance of changes.
TT15	TT15	*Impacts of construction haulage vehicles*	Construction haulage vehicles will be managed to: ■ Adhere to the nominated haulage routes ~~and speeds~~ identified in the Construction Traffic and Access Management Plan **and posted speed limits** ■ Minimise idling and queuing on public roads ■ Minimise movement of vehicles during peak periods.
TT16	TT16	*Cumulative construction traffic impacts*	The potential for cumulative construction traffic impacts will be reviewed and coordinated with other projects, **in consultation with the Airport Precinct Infrastructure Coordination Operations Group and the Traffic and Transport Liaison Group**. The review will include: ■ Considering other projects with the potential to affect access and capacity, particularly in the vicinity of Terminals 2/3 ■ Detailed reviews of programs for traffic staging, lane and road closures for all projects ■ Coordinating works and identifying efficient re-routing options during periods of road and lane closures.
Noise and vibration			
NV1	NV5	*Managing the potential for noise and vibration impacts during construction*	A Construction Noise and Vibration Management Plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage noise and vibration and minimise the potential for impacts during construction, consistent with the management approach and mitigation measures in the ~~Roads and Maritime's~~ *Construction Noise and Vibration Guideline* **(Roads and Maritime, 2016).**

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
NV2	NV6		Location and activity specific noise and vibration impact assessments will be undertaken prior to those works (as a minimum): ■ With the potential to result in noise levels above 75 dBA at any receiver ■ That need to occur outside standard construction hours and are likely to result in noise levels greater than the relevant noise management levels ■ With the potential to exceed relevant performance criteria for vibration. The assessments will confirm predicted impacts at relevant receivers in the vicinity of the activities to assist with the selection of appropriate management measures. Monitoring will be carried out at the start of new noise and vibration intensive activities to confirm that actual levels are consistent with the predictions.
NV4	NV7	*Potential impacts at hotels*	The facades of hotels likely to be affected by construction will be assessed to confirm existing façade performance (external to internal noise transmission) in consultation with the hotel operators. Location and activity-specific noise and vibration impact assessments undertaken for works in the vicinity of hotels will adopt the results of the assessment for each affected hotel to assess potential internal noise levels within the hotel rooms more accurately (see Technical Working Paper 2).
NV5	NV8	*Potential impacts on the Qantas Flight Training Centre*	**The potential for impacts on the existing Flight Training Centre will be managed in accordance with the acoustic framework that has been agreed with Qantas.** **A similar acoustic framework will be developed for the new Qantas Flight Training Centre and implemented (once constructed) to minimise potential impacts during construction. The framework will be developed in consultation with Qantas and will include:** ■ **Confirmation of building and simulator cabin acoustic performance and external to internal transfer functions for noise and vibration** ■ **A process for setting external triggers levels for monitoring that are protective of the internal facility training functions from an acoustic perspective** ■ **Monitoring requirements** ■ **Communication protocols.** ~~A construction strategy will be developed in consultation with Qantas to minimise potential impacts on training operations at the Qantas Flight Training Centre in its current location. It will include:~~ ■ ~~Confirming appropriate internal noise criteria for sensitive areas in the facility~~ ■ ~~Confirming building and simulator cabin acoustic performance~~ ■ ~~External criteria for noise and vibration~~ ■ ~~Working distances for noise and vibration intensive plant and activities~~ ■ ~~Alternative work methods that generate less noise and vibration and minimise vibration transmission~~ ■ ~~Real-time monitoring requirements.~~

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
NV6	NV9	*Construction management and scheduling*	Investigate and implement alternative methods of demolition to avoid hydraulic/pneumatic hammering where high noise impacts are anticipated. Alternative methods could include shears, pulveriser or ripper attachments fitted onto the excavators.
NV7	NV10		Noisy work and vibration intensive activities (those activities that exceed the vibration criteria) will be scheduled during standard construction hours as far as possible. Works or activities that cannot be undertaken during standard construction hours will be scheduled as early as possible during the evening and/or night-time periods. Respite measures will be implemented for noisy work and vibration intensive activities in a manner consistent with the ~~Roads and Maritime~~'s *Construction Noise and Vibration Guideline* **(Roads and Maritime, 2016)**.
NV8	NV11		Hoarding, or other shielding structures, will be used **for construction compounds and** ~~where receivers are impacted near~~ fixed works areas **where construction noise would exceed relevant noise management levels at nearby sensitive receivers**. The barriers should be of solid construction with minimal gaps.
NV9	NV12	*Management of the potential for vibration impacts during construction*	Vibration generating activities will be managed to minimise the potential for impacts on structures and sensitive receivers, including maximising minimum working distances where practicable, or alternate methods to minimise vibration where minimum working distances cannot be achieved. **Prior to the commencement of vibration-intensive works within the minimum working distances for cosmetic damage, the potential for damage will be assessed. Where there is potential for damage, alternative methods that generate less vibration will be investigated and substituted where practicable.** **Where residual risks remain, condition surveys will be carried out and vibration monitoring will be undertaken. Vibration monitors will provide real-time notification of exceedances of levels approaching cosmetic damage and human comfort criteria. Any identified vibration-related damage ~~to the items~~ will be rectified.** ~~Where alternatives cannot be implemented, vibration monitoring will be undertaken and receptors notified in advance of works. Vibration monitors will provide real-time notification of exceedances of levels approaching cosmetic damage and human comfort criteria.~~
NV10	NV13	*Potential vibration impacts on pipelines*	Prior to vibration intensive works in the vicinity of pipelines, the owners of each potentially affected pipeline will be consulted to confirm the potential for impacts from vibration and any appropriate criteria. Management protocols to protect the integrity of each affected pipeline, including monitoring requirements, will be developed in consultation with each asset owner as required, and implemented for all vibration intensive works in the vicinity of pipelines.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
NV11	NV14	*Potential impacts on buildings and structures*	Building condition surveys will be completed before and after construction works where buildings or structures are within the minimum vibration working distances for cosmetic damage.
~~NV12~~		~~*Potential vibration impacts*~~	~~Prior to the commencement of vibration-intensive works within the minimum working distances for cosmetic damage, for heritage items, the potential for damage to the item will be assessed. Where there is potential for damage, alternative methods that generate less vibration will be investigated and substituted where practicable.~~ ~~Where residual cosmetic damage risks remain, condition surveys will be carried out and vibration monitoring with real-time notification of exceedance will occur during the activity. Site activities will be modified where practicable to avoid exceeding the cosmetic damage criteria. Any identified vibration-related damage to the items will be rectified.~~
NV13	NV15	*Cumulative noise and vibration impacts*	The likelihood of cumulative and consecutive construction noise impacts, particularly when undertaken outside standard construction hours, will be reviewed prior to construction and coordinated with other nearby projects to minimise impacts, where possible.
Airport operations			
AS10	AS10	*Wildlife attraction as a result of drainage and flooding management infrastructure*	Drainage and flood management infrastructure will be managed during construction to minimise the risk of attracting wildlife.
AS11	AS11	*Construction lighting*	Construction lighting will be selected and located to meet Sydney Airport's restricted lighting zone requirements. For locations where it is not possible to achieve the required intensity levels, works requiring lighting will be undertaken in accordance with the requirements of Sydney Airport Corporation, which may involve restricting the timing of works to outside Sydney Airport's operational hours. Construction lighting will comply with section 9.21 of the Manual of Standards (CASA 2017) and the *National Airports Safeguarding Framework* (Guideline E) (DITCRD, 2018).
AS12	AS12	*Temporary intrusions of Sydney Airport's prescribed airspace*	Construction planning will ensure that intrusions of Sydney Airport's prescribed airspace are minimised as far as practicable. Where temporary intrusions of the prescribed airspace cannot be avoided, works likely to result in intrusions will be undertaken in accordance with the requirements of Sydney Airport Corporation (for short-term works less than three months) or the Department of Infrastructure, Transport, ~~Cities and~~ Regional Development **and Communications** for long-term works (more than three months) and any controlled activity approvals for these works. This will include timing works to avoid **intrusions during** Sydney Airport's operational hours.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
Air quality			
AQ1	AQ2	*Managing air quality impacts during construction*	A Construction Air Quality Management Plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage air quality, odour and landfill gas and minimise the potential for impacts during construction. The plan will include an air quality, odour and landfill gas monitoring program, and will detail the measures that will be implemented to compare the actual performance of construction against the predicted performance. Monitoring will be undertaken for the duration of construction.
AQ2	AQ3	*Avoiding odour impacts during construction*	Odour impacts at the former Tempe landfill will be minimised as far as possible by: ■ Construction planning to minimise the need to expose waste, ~~and/or~~ the area exposed at any ~~one~~ time **and to minimise contact between surface water and exposed waste** ■ Where there is the potential to generate odour, **implementing** ~~this will be managed in accordance with~~ the odour management strategy (measure AQ4). Further modelling will be carried out to demonstrate that the proposed excavation methodology for the former Tempe Landfill can comply with the 2 OU criterion. **This will be informed by sampling of the waste to determine the actual waste odour emission rates likely to occur.**
AQ3	AQ4	*Monitoring and controlling odour at the former Tempe landfill*	An odour management strategy will be developed ~~prior to construction~~ and implemented for the duration of works involving ground disturbance at the former Tempe landfill. The strategy will include: ■ Proposed work methods and mitigation measures that aim to limit odour at sensitive receptors to no more than the 2 OU criterion ■ Routine observation of weather conditions ■ Regular odour surveys at receptor locations by appropriately qualified professionals (see AQ5) ■ Measures to minimise the generation of odour ~~at the end of each work day/shift~~ ■ Mechanisms for investigating odour complaints, including conduct of additional odour surveys ■ Contingency and rectification measures (eg use of deodorisers, **aeration of leachate storage(s)**) should significant odour issues occur at sensitive receivers in the vicinity of the project site.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
AQ4	AQ5		Odour surveys will be undertaken at downwind receptors for the duration of works involving ground disturbance at the former Tempe landfill **generally** in accordance with *Determination of odorants in ambient air by field inspection* (VDI 3940, 1993). The odour surveys will be undertaken: ■ Daily, for one hour when works commence, and prior to works completing ■ If wind conditions drop below three metres per second ■ If an odour complaint is received ■ **Downwind of leachate storage(s)**. If significant odour issues are observed in the vicinity of sensitive receptors **or from leachate storage(s)**, the contingency and rectification measures defined by the odour management strategy will be implemented (see AQ4).
AQ5	AQ6	*Impacts on air quality as a result of demolition*	Demolition activities, including removal of hazardous building materials, will be planned and carried out in a manner that minimises the potential for dust generation.
AQ6	AQ7	*Cumulative dust impacts arising from concurrent construction of the Gateway road project and the Botany Rail Duplication project*	The detailed construction program will be developed in consultation with the contractors constructing the Botany Rail Duplication project. Consultation will be maintained over the duration of both projects to plan activities in a manner that reduces the potential for air quality-related impacts. Where practicable, activities with a high potential to generate dust will be programmed so that they do not occur at the same time.
Contamination and soils			
CS4	CS8	*Demolition of structures containing hazardous substances*	Hazardous materials surveys will be undertaken to inform construction planning, including demolition activities and utility adjustments.
CS5	CS9	*Potential impacts of soil disturbance*	A Construction Soil and Water Management Plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage potential soil and water quality impacts during construction, including potential impacts associated with the presence of existing contamination, stockpile management, saline soils and acid sulfate soils. The Construction Soil and Water Management Plan will be prepared in accordance with relevant guidelines and standards, including *Managing Urban Stormwater – Soils and Construction*, Volume 1 (Landcom, 2004) Volume 2B Waste landfills (DECC, 2008a) and Volume 2D (DECC, 2008b) (the Blue Book).

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
CS6	CS10	*Acid sulfate soils*	An Acid Sulfate Soils Management Plan will be prepared as part of the Construction Soil and Water Management Plan in accordance with the *Acid Sulfate Soils Assessment Guidelines* (ASSMAC, 1998). The plan will define the process and measures to manage actual and potential acid sulfate soil and sediment disturbed during construction. The plan will include a summary of available acid sulfate soil information relevant to the project site and identify any further soil/water analysis required as a precursor to implementing the management plan. Acid sulfate soils will be disposed off site (where required) in accordance with the *Waste Classification Guidelines - ~~Part 1 and~~ Part 4: Acid sulfate soils* (NSW EPA, 2014).
CS7	CS11	*Impacts on sediments in Alexandra Canal during construction*	A plan of management will be developed in accordance with the remediation order and implemented to manage work within Alexandra Canal and minimise the disturbance and migration of contaminated sediments. The plan will identify specific methodologies to minimise disturbance and dispersion of potentially contaminated sediments. The plan will be prepared in consultation with Sydney Water Corporation and submitted for the NSW EPA's approval in accordance with the remediation order requirements.
CS11	CS12	*Works at the former Tempe landfill*	The potential for settlement will be considered as part of the siting and layout of construction compounds and work areas in the former Tempe landfill. Where required, ground treatment (eg foundation layers or sheet piling) will be provided to minimise this risk.
CS12	CS13		Landfill material **excavated during the project** will be appropriately handled and stockpiled, to ensure minimal impact to the surrounding community, on-site workers and the environment. ■ ~~Managed in accordance with the requirements of *Environmental Guidelines: Solid waste landfills* (NSW EPA, 2016a).~~ Excavated landfill waste to be disposed of will be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (NSW EPA, 2014) before being disposed of at an appropriately licensed waste facility.
CS13	CS14	*Landfill gas intrusion*	Protocols to address and manage landfill gases within the construction footprint in the former Tempe landfill and Sydney Airport northern lands car park will be developed and implemented during construction. The protocols will consider confined and/or enclosed spaces and appropriate controls as required (eg forced ventilation), and will include appropriate occupational monitoring.
CS14	CS15		Hot works within the former Tempe landfill and Sydney Airport northern lands car park will be restricted where there is a potential for fire or explosion. Monitoring for potentially flammable gases will occur during all hot works.
CS15	CS16	*Works within Sydney Airport land*	Any material imported and used within Sydney Airport land will be tested prior to use to ensure it does not exceed the acceptable limits in the PFAS National Environmental Management Plan (HEPA, 2018) and Schedule 3 of the *Airports (Environment Protection) Regulations* 1997.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
CS16	CS17	*Stockpile management and handling*	Storage and containment systems for the stockpiling of contaminated material during construction will be designed to be impervious to the materials stored, resistant to fire (where required), covered to prevent contact with rainfall, and managed and maintained to prevent any release of liquids and contaminated run-off to stormwater drains, waters and land.
CS17	CS18	*Management of previously unidentified contaminated material*	The discovery of previously unidentified contaminated material will be managed in accordance with an unexpected contaminated finds procedure, as outlined in the *Guideline for the Management of Contamination* (Roads and Maritime, 2013) and detailed in the CEMP. Awareness training will be provided for all on-site staff to assist in the identification of potentially contaminated material as per the unexpected contaminated finds procedure. In the event that unexpected indicators of contamination are encountered during construction (such as odours or visually contaminated materials), work in the area will cease, and the finds will be managed in accordance with the unexpected contaminated finds procedure.
CS18	CS19	*PFAS impacted soil and groundwater*	PFAS contaminated materials will be managed in accordance with the risk-based framework presented in the *PFAS National Environmental Management Plan* (HEPA, 2018). If soil and/or water containing PFAS is proposed for reuse, the proposed reuse must not result in an unacceptable or increased risk to human health and/or the environment. A health and environmental risk assessment and consultation with the NSW EPA (and the Airport Environment Officer where the works are on Sydney Airport land) will be required before any reuse of PFAS contaminated soil and/or water.
CS19	CS20	*Remediation/ management of existing contamination*	Validation of remediation will be undertaken during construction and a validation report prepared by a suitably qualified environmental consultant as defined in Schedule B9 of the NEPM to confirm the requirements of the RAP(s) have been met. For works on land subject to the EP&A Act, the validation report will be reviewed by a **NSW EPA-accredited** site auditor ~~accredited in accordance with the site auditor scheme under the CLM Act~~. For works on Sydney Airport land, Sydney Airport Corporation and the Airport Environmental Officer will review the report.
CS21	CS21	*Rehabilitation of disturbed areas*	A rehabilitation strategy will be prepared to guide the approach to rehabilitation of disturbed areas following the completion of construction.
CS22	CS22	*Condition of the former Tempe landfill cap*	**A condition assessment of the integrity of the landfill cap will be carried out by a suitably qualified specialist prior to any works with the potential to affect the cap. In areas where the landfill cap is retained, visual inspections and rectification measures will be implemented as needed during construction.** **A final condition assessment will be carried out at the completion of construction detailing recommendations for any additional rectification required.**

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
Flooding			
HF1	HF6	*Management of the potential for flooding impacts during construction*	A flood mitigation strategy will be prepared and relevant measures will be implemented as part of the design and during construction. The strategy will include undertaking additional flood modelling taking into account detailed design and proposed construction planning and methodologies.
HF2	HF7	*Impacts on flood behaviour from construction*	Hydrologic and hydraulic assessments will be carried out for all temporary and permanent project components (including ancillary facilities) that have the potential to affect flood levels in the vicinity of the project. The results of the assessment will inform the preparation of the Flood Mitigation Strategy (measure HF1) as well as the design of temporary construction facilities and design development.
HF6	HF8	*Potential flood impacts on ancillary construction facilities*	As a minimum, site facilities will be located outside high flood hazard areas based on a one per cent AEP flood. For site facilities located within the floodplain, the flood mitigation strategy will identify how risks to personal safety and damage to construction facilities and equipment will be managed.
Groundwater			
GW4	GW4	*Dewatering of excavation*	A dewatering management strategy will be developed to confirm the approach to managing dewatering of excavations during construction. The strategy will: ■ Outline measures to minimise groundwater inflow ■ Describe likely groundwater quality based on sampling data ■ Estimate potential groundwater inflow rates and volumes for proposed excavations ■ Identify proposed methods for managing extracted water, which could include reuse, infiltration, reinjection, discharge to stormwater, disposal to the wastewater system, and collection for off-site disposal ■ Include a feasibility assessment of each proposed management option for extracted groundwater ■ Identify any ~~groundwater~~ treatment requirements and methods for any of the proposed management options ■ Describe any applicable monitoring requirements.
GW5	GW5	*Managing leachate within the former Tempe landfill*	A leachate management strategy will be developed to manage leachate at the former Tempe landfill during construction and ensure that the objectives of the site's voluntary remediation agreement continue to be met. The strategy will: ■ Identify predicted changes in leachate volumes due to the project, based on the detailed construction methodology ■ Identify any required changes to the existing leachate management system due to predicted changes in leachate volume and concentration and any other changes due to the project ■ Describe a framework for monitoring leachate levels and **water** quality to ensure that no leachate migrates into Alexandra Canal **as a result of the project**. The strategy will be developed in consultation with ~~relevant stakeholders, including~~ Inner West Council, Sydney Water and the NSW EPA.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
GW6	GW6	*Monitoring of construction impacts*	The existing groundwater monitoring program will continue during construction, and will be supplemented as required, to: ■ Confirm groundwater quality to inform the selection management options for extracted groundwater, including treatment requirements for discharge ■ Monitor potential migration **of** contaminants due to groundwater extraction (if it is a credible risk) ■ Confirm if acidification of groundwater is occurring due to exposure of acid sulfate soils ■ Confirm local groundwater levels to inform estimation of potential inflows and dewatering rates ■ Monitor drawdown levels and radii of influence **as well as extraction rates** to allow comparison against predictions ■ ~~Confirm any changes to groundwater levels due to the cumulative impacts of other projects.~~
N/A	GW7	*Condition of the leachate treatment plant*	**A condition assessment of the leachate collection, monitoring and treatment system will be carried out by a suitably qualified specialist prior to project activities that could affect leachate generate and management.** **A final condition assessment will be carried out at the completion of construction to ensure the leachate collection, monitoring and treatment system is returned to council with the same functionality and condition, subject to fair wear and tear.**
Surface water			
SW3	SW5	*Sedimentation and scour protection at Alexandra Canal*	All works within or adjacent to Alexandra Canal will be managed in accordance with **the principles outlined in** *Guidelines for Controlled Activities on Waterfront Land – Riparian corridors* (Department of Industry, 2018).
SW6	SW6	*Monitoring water quality*	A water quality monitoring program will be developed and implemented as part of the Construction Soil and Water Management Plan to monitor potential surface water quality impacts. The program will define: ■ Monitoring parameters ■ Monitoring locations ■ Frequency and duration of monitoring. The monitoring program will include ongoing baseline monitoring to determine the water quality of potential receiving waters prior to commencement of construction. ~~Proposed discharge will be updated as required prior to construction based on the baseline data at the time.~~ Water quality monitoring will continue for a minimum of 12 months following the completion of construction, or until affected watercourses are certified by a suitably qualified and experienced independent expert as ~~being~~ **returned** ~~rehabilitated~~ to an acceptable condition (or as otherwise required by any project conditions of approval). **All surface water data related to Alexandra Canal will be provided to Sydney Water for the duration of the monitoring program.**

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
SW7	SW7	*Discharge to surface water*	The performance of treatment systems required to treat construction water before discharge will be verified in relation to the established discharge criteria.
N/A	SW8		**The discharge criteria specified in Appendix H would be met for any extracted groundwater or surface water that has come into contact with excavated waste materials prior to discharge into Alexandra Canal and connected stormwater systems.**
N/A	SW9		**Options to reuse construction water, such as for dust suppression and irrigation of rehabilitated and landscaped areas, would be investigated and adopted where practicable to minimise the volumes requiring discharge or disposal.**
SW8	SW10	*Release of sediment-laden water during works in northern ponds*	Construction planning will ensure that operation of the sluice gate at the northern ponds outlet to Alexandra Canal is not affected by the works.
N/A	SW11	*Management of surface water runoff within the former Tempe landfill*	**The management of surface water runoff for works within the former Tempe landfill will adopt the following principles:** ▪ **Isolate exposed waste from surface water runoff from other areas** ▪ **Minimise contact between rainfall and surface water runoff and exposed waste** ▪ **Capture and store (temporarily) surface water runoff from areas of exposed waste (leachate)** ▪ **Size leachate storage(s) based on updated water balance modelling to reflect the proposed construction methodology and to minimise the risk of the capacity being exceeded.**
Non-Aboriginal heritage			
NAH7	NAH7	*Managing heritage impacts during construction*	A Heritage Management Plan will be prepared prior to construction and implemented as part of the CEMP. It will include measures to manage non-Aboriginal heritage and minimise the potential for impacts during construction. The plan will take into account relevant conservation and heritage management policies in the Alexandra Canal Conservation Management Plan and the Sydney Airport Heritage Management Plan.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
NAH8	NAH8	*Impacts on archaeology*	A Historical Archaeological **Assessment and** Research Design and Excavation Methodology will be prepared for, and implemented at, the following locations within the project site: ■ Intact sections of Alexandra Canal along the western bank of the canal on either side of the existing pedestrian and rail bridges ■ ~~Vacant land at 30 Canal Road (Lot 4 DP 555771 and Lot 3 DP 825649)~~ ■ Land located north of Canal Road that is currently used for the construction (stockpiling) of the New M5 (Lot A DP 391775, Lot B DP 394647 and Lot 2 DP1168612) ■ Sydney Airport land considered to contain low or moderate archaeological potential ■ Land along Qantas Drive considered to contain low or moderate archaeological potential ■ Sydney Airport land located east of Sydney Airport northern lands car park and west of Botany Rail Line (Lot 1 DP 826101) ■ Land to the west of Boral's St Peters facility and east of the Botany Rail Line. The Historical Archaeological Assessment and Research Design and Excavation Methodology will identify the specific features of archaeological significance that could be present at these locations, provide a scope for further investigations to confirm and specify appropriate archaeological management for any remains identified.
NAH9	NAH9	*Archival recording*	Photographic archival recording will be carried out for affected sections of the following items: ■ Alexandra Canal ■ Sydney (Kingsford Smith) Airport Group ■ Cooks River Container Terminal ■ Mascot (Shea's Ck) Underbridge ■ Botany Rail Line. Photographic archival recording will be carried out prior to works commencing in the vicinity of the item, and in accordance with *How to Prepare Archival Records of Heritage Items* (NSW Heritage Office, 1998) and *Photographic Recording of Heritage Items Using Film or Digital Capture* (Heritage Office, 2006). Once complete, a report will be prepared detailing the history and significance of the item, relevant findings from the archival recording and an overview of the project. This document would subsequently be held by the appropriate local council(s), local library, local historical society and the owner of the asset.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
NAH10	NAH10	*Avoiding impacts during construction*	Heritage items and landscaping located outside the project site and associated with the following items will be marked on site plans contained within the CEMP as areas to be avoided during construction, where works are proposed within 10 metres of: ■ Alexandra Canal (significant fabric and gazetted curtilage as detailed in the conservation management plan for Alexandra Canal) ■ Sydney (Kingsford Smith) Airport Group – fabric of high significance (as identified in the Sydney Airport Heritage Management Plan), trees and plantings ■ Cooks River Container Terminal – fabric of high significance, trees and plantings ■ Mascot (Shea's Ck) Underbridge – fabric associated with the bridge. Protective barriers will be established prior to works at these locations.
NAH11	NAH11	*Potential vibration impacts on heritage items*	Potential vibration impacts on features of heritage significance will be managed in accordance with the Construction Noise and Vibration Management Plan (measure **NV5**) and noise and vibration mitigation measure **NV12.**
NAH12	NAH12	*Unexpected finds*	Any items of potential heritage conservation significance or human remains discovered during construction will be managed in accordance with the *Unexpected Heritage Items Heritage Procedure 02* (Roads and Maritime, 2015a).
Aboriginal heritage			
AH2	AH3	*Archaeological investigation areas impacted by the project*	Archaeological salvage excavation will be undertaken prior to construction within those parts of Investigation Area 1 and Investigation Area 2 where deep sediments would be directly impacted by the project. Archaeological salvage excavation ~~(including post-excavation analysis and reporting)~~ will be completed prior to any activities that may result in harm to Aboriginal objects in these areas.
AH4	AH4	*Managing heritage impacts during construction*	An Aboriginal Heritage Management Plan will be prepared prior to construction and implemented as part of the CEMP. The plan will include measures to manage Aboriginal heritage and minimise the potential for impacts during construction. It will include the proposed salvage methodology, unexpected find procedure (see measure AH6) and process for additional consultation with Aboriginal stakeholders.
AH5	AH5	*Aboriginal consultation*	Aboriginal stakeholder consultation will continue to be undertaken in accordance with the *Procedure for Aboriginal cultural heritage consultation and investigation* (Roads and Maritime, 2011) and *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010).
AH6	AH6	*Unexpected finds*	If suspected Aboriginal heritage items or human remains are uncovered during construction they will be managed in accordance with the *Unexpected Heritage Items Heritage Procedure 02* (Roads and Maritime Services, 2015a).
Land use and property			
LU5	LU5	*Impacts on privately-owned land or land owned by the NSW or local government*	Acquisition will be undertaken in accordance with: ■ *The Land Acquisition (Just Terms Compensation) Act 1991* (NSW) ■ *Determination of compensation following the acquisition of a business* (NSW Government, undated).

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
LU6	LU6	*Impacts on Commonwealth-owned land subject to a lease with Sydney Airport Corporation*	Sydney Airport, as the leaseholder of the land, will notify tenants that their sub-lease agreements will be concluded. Termination of leases will be undertaken in accordance with the contract terms with Sydney Airport Corporation and the tenant. Sydney Airport will provide support to manage the return of lands and handover to **Transport** ~~Roads and Maritime~~.
LU7	LU7	*Impacts on Qantas Flight Training Centre*	Consultation with Qantas will occur throughout construction planning and construction to minimise impacts on the: ■ **Existing** ~~Qantas~~ Flight Training Centre until the relocation process is complete ■ **New Flight Training Centre once it is operational.**
N/A	LU8	*Damage to properties and infrastructure*	**Condition surveys for structures and infrastructure at potential risk of damage due to construction of the project will be undertaken prior to commencement of the proposed activity. Rectification measures will be implemented during construction to address any damage caused by the project. A final condition assessment will be carried out at the completion of construction detailing recommendations for any additional rectification required.**
Socio-economic			
SE1	SE3	*Potential social and community impacts during construction*	A communications strategy will be prepared to detail the process of communicating and engaging with the community and stakeholders in the lead up to, and during, construction. It will ensure that: ■ The community and stakeholders have a high level of awareness and forewarning of all processes and activities ■ Accurate and accessible information is made available ■ A timely response is given to issues and concerns raised by the community ■ Feedback from the community is encouraged ■ Opportunities for input are provided. In relation to the potential for socio-economic impacts, the strategy will include: ■ Communication with potentially affected residents, other community members, businesses and other key stakeholders to provide information about the project, and the likely nature, extent and duration of amenity and access changes during construction ■ Protocols to identify and engage with vulnerable persons that might be affected by construction ■ Protocols for communicating information about potential access delays in and around Sydney Airport and other relevant project information.
SE2	SE4	*Potential impacts on businesses*	Business management plans will be prepared and implemented for businesses affected by the project. The plans will be developed on a case by case basis and will detail specific measures, developed in consultation with the business operator. These will include: ■ Protocols to identify, in consultation with each affected business, feasible and reasonable measures to maintain vehicular and pedestrian access during business hours, and visibility of the business to potential customers during construction, including alternative arrangements for times when access and visibility cannot be maintained ■ Measures to respond to identified impacts as far as possible.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
SE5	SE5	*Impacts on the off-leash dog exercise area*	~~A temporary off-leash dog exercise area will be provided. Access to this area will be maintained throughout construction, and temporary parking spaces will be provided. The location of the off-leash dog exercise area and the number of temporary parking spaces will be confirmed in consultation with Council. The condition of the temporary off-leash dog exercise area will be regularly monitored and maintained.~~ **Transport will continue to consult with Inner West Council with the aim of providing a temporary off-leash dog exercise area in the vicinity of the project during construction.**
SE6	SE6	*Impacts on community facilities and infrastructure*	Access to community facilities and infrastructure will be maintained during construction. Where alternative access arrangements need to be made, these will be developed in consultation with relevant service providers and communicated to users. Any changes to access arrangements will be managed in accordance with the Construction Traffic and Access Management Plan.
Landscape character and visual amenity			
LV7	LV8	*Visual impacts during construction*	The design and maintenance of construction compound hoardings will aim to minimise visual amenity and landscape character impacts.
LV8	LV9		The selection of materials and colours for hoardings will aim to minimise their visual prominence.
LV9	LV10		Lighting of work areas, compounds, and work sites will be oriented to minimise glare and light spill impact on adjacent receivers.
LV10	LV11	*Tree protection during construction*	Trees to be retained will be protected prior to the commencement of construction in accordance with *AS4970-2009 Protection of trees on development sites* and the project's tree management strategy. Any tree pruning will be undertaken in accordance with the project's tree management strategy **and carried out** ~~guided by a tree report prepared~~ by a qualified arborist.
LV11	LV12	*Site rehabilitation*	Following completion of construction, site restoration will be undertaken in accordance with the rehabilitation strategy (measure CS23). Temporary impacts on public open space will be rehabilitated in consultation with the relevant local council and/or landowner.
Biodiversity			
BD3	BD3	*Managing the potential for biodiversity impacts during construction*	A Construction Biodiversity Management Plan will be prepared prior to construction and implemented as part of the CEMP. It will include measures to manage biodiversity and minimise the potential for impacts during construction. The plan will be prepared in accordance with relevant legislation, guidelines and standards.
Health, safety and hazards			
HS1	HS1	*Spill response*	A spill response procedure will be developed as part of the project's incident management protocols. The procedure and incident management protocols will detail processes, responsibilities and measures to manage hazardous substances and dangerous goods, including storage, handling and spill response, in accordance with legislative requirements.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – construction (including pre-construction)
HS2	HS2	*Utility management*	A utilities contingency management plan will be prepared and will include measures to manage any utility service disruptions during construction. This will include procedures to respond to ~~and~~ **any** unplanned outages of services, particularly for critical Sydney Airport infrastructure.
HS3	HS3	*Alterations to the ethylene pipeline*	A safety management study will be prepared for any proposed alterations to the ethylene pipeline in accordance with *AS 2885 Pipelines – Gas and liquid petroleum*. The outcomes of the safety management study will be incorporated in construction planning.
HS4	HS4	*Emergency response*	An emergency response plan will be prepared and will include measures to manage emergency situations during construction, including those associated with fires, flooding or other threats to public safety.
HS5	HS5	*Fire risk*	All works involving potential ignition sources within the former Tempe landfill will be subject to a risk assessment or ban on total fire ban days.
HS6	HS6	*Transport of dangerous goods and hazardous materials*	The transport of dangerous goods will be undertaken in accordance with the Dangerous Goods (Road and Rail Transport) Regulation 2009 and the *Australian Code for the Transport of Dangerous Goods by Road & Rail* (National Transport Commission, 2017).
Waste management			
WM2	WM2	*Construction waste and spoil management*	A Construction Waste Management Plan will be prepared as part of the CEMP and implemented during construction. The plan will adopt the waste hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001* and will detail processes, responsibilities and measures to manage waste and minimise the potential for impacts during construction.
WM3	WM3		Construction waste will be minimised by accurately calculating materials brought to the site and limiting materials packaging where possible.
WM4	WM4		All waste disposal will be in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014).
WM5	WM5	*Attraction of wildlife at the former Tempe landfill*	The following measures would be implemented during works at the former Tempe landfill to avoid attracting wildlife: ▪ Staging the excavation to minimise the amount of exposed waste at any one time ▪ Minimising the size and area of exposed stockpiles ▪ Ensuring material that has been disturbed, uncapped, or temporarily stockpiled is suitably covered at the end of each day.
WM6	WM6	*Management of unexpected waste materials*	Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Areas will be hardstand or lined areas that are appropriately stabilised and bunded, with sufficient space for stockpile storage.
Climate change and greenhouse gas			
GHG4	GHG4	*Greenhouse gas emissions*	**A minimum of 20 per cent** ~~An appropriate portion~~ of construction phase **electricity** ~~energy~~ will be purchased from an accredited GreenPower product.

Table 2.3 Compilation of mitigation measures for operation

EIS/pdMDP ID	New ID	Issue	Mitigation measures – operation
Traffic, transport and access			
TT17	TT17	*Operational road network performance including potential increased traffic on some parts of the network*	A review of operational network performance will be undertaken 12 months and five years from the commencement of operation to confirm the operational traffic impacts on surrounding arterial roads and major intersections. The review will identify measures (as required) to address impacts on road network performance. The results of the review will be considered in future operational network performance planning carried out by **Transport** ~~Roads and Maritime~~.
TT18	TT18	*Active transport opportunities*	**Transport** ~~Roads and Maritime~~ and Sydney Airport Corporation will prepare an active transport strategy to integrate and enhance accessibility opportunities. The strategy will be prepared in conjunction with relevant stakeholders and provide a guide for future active transport infrastructure provision. **This will include exploring options for active transport connections between the Alexandra Canal cycleway and the Terminals 2/3 precinct.**
Noise and vibration			
NV16	NV16	*Operational noise and vibration impacts of the project*	Operational noise mitigation performance will be documented in an Operational Noise and Vibration Review conducted within 12 months of the commencement of operation. The need for additional mitigation or management measures to address identified operational performance issues and meet relevant operational noise criteria will be assessed and implemented where feasible and reasonable.
Airport operations (hazards and risks)			
AS12	AS13	*Wildlife attraction as a result of drainage and flooding management infrastructure*	Drainage and flood management infrastructure will be managed during operation to minimise the risk of attracting wildlife.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – operation
Contamination and soils			
CS20	CS23	*Remediation/ management of existing contamination*	The requirements for ongoing monitoring and maintenance of any installed or reinstated remediation systems will be documented in EMP(s) prepared for the respective areas. The EMP(s) will be prepared and implemented in accordance with the following requirements: ■ The voluntary remediation proposal, EMP and any RAPs in place for the former Tempe landfill, including requirements for ongoing gas monitoring ■ The requirements of the Sydney Airport RAP and EMP (if applicable) ■ *National Environment Protection (Assessment of Site Contamination) Measure 1999* ■ *Environmental Guidelines: Solid waste landfills* (NSW EPA, 2016) (for ~~reinstatement of the capping layer and/or design of the new capping layer and final road pavement at~~ the former Tempe landfill). The EMP(s) will be: ■ Prepared in consultation with the Airport Environmental Officer, **Inner West Council** and NSW EPA (as relevant) ■ For works on land subject to the EP&A Act – approved by a ~~n independent~~ **NSW EPA-accredited** site auditor ~~accredited under the site auditor scheme under the CLM Act~~ ■ For works on Sydney Airport land – approved by Sydney Airport Corporation and endorsed by the Airport Environment Officer. Following implementation and validation of the RAP(s) (if required by the existing EMP), and approval of the EMP(s), the site auditor will prepare a Site Audit Statement confirming the suitability of the project site for the proposed development (for works on land subject to the EP&A Act). For works on Sydney Airport land, the Airport Environmental Officer will confirm the objectives of the remediation have been met.
CS22	CS24	*Contamination during operation*	Spills and leaks of vehicles or maintenance plant and equipment will be managed in accordance with **Transport's** ~~Roads and Maritime's~~ standard operating procedures.
CS23	CS25		Ongoing management measures will be implemented for any areas where contamination remains following construction, and has the potential to cause an ongoing risk to maintenance works, the community and/or the receiving environment. These management measures will be documented in the EMP(s).
Flooding			
HF7	HF9	*Adaptive management of infrastructure*	**Transport's** ~~Roads and Maritime~~ and Sydney Airport Corporation will review measures to maintain or improve over time the flood immunity of the infrastructure resulting from the effects of climate change.
Land use and property			
LU8	LU9	*Future management of residual land*	The ongoing management of residual land, and **Transport's** ~~Roads and Maritime's~~ role in this process, will be confirmed in consultation with Inner West Council.
Waste management			
WM7	WM7	*Operational waste management*	Operational waste, including general litter clean up, will be managed in accordance with existing operational maintenance requirements for the project and the waste hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001*.

EIS/pdMDP ID	New ID	Issue	Mitigation measures – operation
Sustainability			
SU2	SU2	*Sustainability management plan*	Prior to the commencement of operation, the sustainability management plan and sustainability initiatives will be reviewed and updated.
Climate change and greenhouse gas			
CC4	CC4	*Emergency management planning*	Operational procedures for emergency planning and management will be prepared to consider the increased risk of flooding and storm surges on the road and active transport link.
CC5	CC5		Emergency management planning will be undertaken in consultation and collaboration with other key agencies and surrounding stakeholders, including Sydney Airport Corporation.
GHG5	GHG5	*Greenhouse gas emissions*	A minimum of six per cent of operational phase ~~energy~~ **electricity** will be purchased from an accredited GreenPower product.