Secretary's Environmental Assessment Requirements

Section 115Y of the *Environmental Planning and Assessment Act 1979*

Application Number	SSI 8931
Proposal	The F6 Extension Stage 1 comprising the construction and operation of a new multi lane road link between the New M5 at Arncliffe and President Avenue at Kogarah, including: - twin motorway tunnels around four kilometres in length - a tunnel portal at Brighton-Le-Sands connecting to on- and off-ramps at a widened President Avenue - ancillary infrastructure and operational facilities - new and modified utility services.
Location	Land generally between the New M5 at Arncliffe and President Avenue at Kogarah
Proponent	Roads and Maritime Services
Date of Issue	23 January 2018

General SEARs

Desired Performance Outcome	Requirement	Current Guidelines[1]
1. Environmental Impact Assessment Process The process for assessment of the proposal is transparent, balanced, well focussed and legal.	1. The Environmental Impact Statement must be prepared in accordance with Part 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (the Regulation). 2. It is the Proponent's responsibility to determine whether the project needs to be referred to the Commonwealth Department of the Environment and Energy for an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). 3. The onus is on the Proponent to ensure legislative requirements relevant to the project are met.	EPBC Act Environment Assessment Process (SEWPAC, 2010)
2. Environmental Impact Statement The project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact, including its cumulative impacts.	1. The EIS must include, but not necessarily be limited to, the following: (a) an executive summary; (b) a description of the project and key components and activities (including ancillary components and activities) required to construct and operate it, including: – the proposed route; – design of the tunnels, interchanges (inclusive of tunnel portals and entry and exit ramps), road user, pedestrian and cyclist facilities, signage and lighting; – surface road upgrade works, including road widening, intersection treatments and grade separation works, property access, parking, pedestrian and cyclist facilities (including appropriate locations for pedestrian and cyclist under passes or overbridges) and public transport facilities; – ancillary infrastructure and operational facilities, such as operational and maintenance facilities, ventilation structures and systems, water treatment structures and systems and fire and emergency services and infrastructure for the proposal, including (if required) additional infrastructure (such as tolling infrastructure); – location and operational requirements of construction ancillary facilities and access; – land use changes as a result of the proposal and the acquisition of privately owned, Council and Crown lands – the relationship and/or integration of the project with existing and proposed[2] transport infrastructure; (c) a statement of the objective(s) of the project, including how it meets the objectives of the overall F6 Extension Proposal. (d) a summary of the strategic need for the project with regard to its State significance and relevant State Government policy;	

[1] Guidelines listed are the current list of guidelines that may be applicable to a SSI project. It is the Proponents responsibility to identify, and justify, which guidelines have been applied to a specific project.

[2] Committed – as identified in relevant State strategies and the like.

Desired Performance Outcome	Requirement	Current Guidelines[1]
	(e) an analysis of any feasible alternatives to the project[3]; (f) a description of feasible options within the project[4], including: – alternative methods considered for the construction of the project, including the tunnels; and – staging of the proposal; (g) a description of how alternatives to and options within the project were analysed to inform the selection of the preferred alternative / option. The description must contain sufficient detail to enable an understanding of why the preferred alternative to, and options within, the project were selected, including: – details of the short-listed route and tunnel options considered, and the criteria that was considered in the selection of the preferred route and tunnel design; – details of the alternative construction methods that were considered, particularly the tie-in with the New M5 tunnel, and the President Avenue interchange; – details of tunnel design and ventilation options considered to meet the air quality criteria for the proposal; and – a justification for the preferred proposal taking into consideration the objects of the *Environmental Planning and Assessment Act 1979;* (h) a concise description of the general biophysical and socio-economic environment that is likely to be directly and indirectly impacted by the project (including offsite impacts). Elements of the environment that are not likely to be affected by the project do not need to be described; (i) a demonstration of how the project design has been developed to avoid or minimise likely adverse direct and indirect impacts during construction and operation of the project; (j) the identification and assessment of key issues as provided in the 'Assessment of Key Issues' performance outcome; (k) a statement of the outcome(s) the proponent would achieve for each key issue; (l) measures to avoid, minimise or offset impacts must be linked to the impact(s) they treat, so it is clear which measures would be applied to each impact; (m) consideration of the interactions between mitigation measures, between impacts and between measures and impacts;[5] (n) identification of other environmental impacts and proposed measures for managing and/or mitigating the level of impact; (o) an assessment of the cumulative impacts of the project taking into account other projects that have	

[3] Alternatives to a project are different projects which would achieve the same project objective(s) including the consequences of not carrying out the project. For example, alternatives to a road project may be a rail project in the same area and alternate routes for the road, or a combination of these alternatives.

[4] Options within the project are variations of the same project. For example, options within a road project could be design of an intersection; the location or design of a bridge; locations for a ventilation outlet.

[5] Measures proposed to avoid or minimise one impact may cause an unintended impact on another issue. Therefore these impacts and their interactions need to be analysed and resolved where possible.

Desired Performance Outcome	Requirement	Current Guidelines[1]
	been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed; (p) an overview of the potential cumulative impacts of the delivery of future stages of the F6 Extension (Arncliffe to Loftus) and likely changes to the magnitude of impacts; (q) statutory context of the project as a whole, including: – how the project meets the provisions of the EP&A Act and EP&A Regulation; and – a list of any approvals that must be obtained under any other Act or law before the project may lawfully be carried out; (r) a chapter that synthesises the environmental impact assessment and provides: – a succinct but full description of the project for which approval is sought; – a description of any uncertainties that still exist around design, construction methodologies and/or operational methodologies and how these would be resolved in the next stages of the project; – a compilation of the impacts of the project that have not been avoided; – a compilation of the proposed measures associated with each impact to avoid or minimise (through design refinements or ongoing management during construction and operation) or offset these impacts; – a compilation of the outcome(s) the proponent would achieve; and – the reasons justifying carrying out the project as proposed, having regard to the biophysical, economic and social considerations, including ecologically sustainable development and cumulative impacts; and (s) relevant project plans, drawings, diagrams in an electronic format that enables integration with mapping and other technical software. 2. The EIS must only include data and analysis that is reasonably needed to make a decision on the proposal. Relevant information must be succinctly summarised in the EIS and included in full in appendices. Irrelevant, conflicting or duplicated information must be avoided.	

Desired Performance Outcome	Requirement	Current Guidelines[1]
3. Assessment of Key Issues* Key issue impacts are assessed objectively and thoroughly to provide confidence that the project will be constructed and operated within acceptable levels of impact. * Key issues are nominated by the Proponent in the SSI project application and by the Department in the SEARs. Key issues need to be reviewed throughout the preparation of the EIS to ensure any new key issues that emerge are captured. The key issues identified in this document are not exhaustive but are key issues common to most SSI projects.	1. The level of assessment of likely impacts must be proportionate to the significance of, or degree of impact on, the issue, within the context of the proposal location and the surrounding environment. The level of assessment must be commensurate to the degree of impact and sufficient to ensure that the Department and other government agencies are able to understand and assess impacts. 2. For each key issue the Proponent must: (a) describe the biophysical and socio-economic environment, as far as it is relevant to that issue, including adequate baseline data, in terms of temporal, spatial and parameters monitored; (b) describe the legislative and policy context, as far as it is relevant to the issue; (c) identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence of the impact (risk assessment),and the cumulative impacts of: i. concurrent project construction activities; and ii. proposed and approved projects (where information is available at the time of writing); (d) demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies); (e) detail how likely impacts that have not been avoided through design would be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant); and (f) detail how any residual impacts would be managed or offset, and the predicted effectiveness of these measures. 3. Where multiple feasible and reasonable options to avoid or minimise impacts are available, they must be identified and considered and the proposed measure justified taking into account the public interest.	
4. Consultation The project is developed with meaningful and effective engagement during project design and delivery.	1. The project must be informed by consultation, including with relevant local, State and Commonwealth government agencies, infrastructure and service providers, special interest groups (including Local Aboriginal Land Councils, Aboriginal stakeholders, sporting associations and groups, environmental groups, pedestrian and bicycle user groups), affected landowners, businesses and the community. 2. The Proponent must document the consultation process including the range of consultation techniques that would be employed for different stakeholder groups, and demonstrate how the project has responded to the inputs received. 3. The Proponent must describe the timing and type of community consultation proposed during the planning for and the design and delivery of the project, the mechanisms for community feedback, the mechanisms for keeping the community informed, and procedures for complaints handling and resolution.	

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	4. The Proponent must consider the potential for consultation, complaint and construction fatigue to occur during construction of the project and describe how community engagement would be sustained, complaint reporting would be encouraged, complaint handling procedures would be responsive and the implementation of mitigation measures would be timely. The Proponent must consider the cumulative impacts from the project and other major projects in the local area.	

Key Issue SEARs

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
1. Transport and Traffic Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts. The safety of transport system customers is maintained. Impacts on network capacity and the level of service are effectively managed. Works are compatible with existing infrastructure and future transport corridors.	1. The Proponent must assess construction transport and traffic (network, vehicle, pedestrian and cyclists) impacts, including, but not necessarily limited to: (a) a considered approach to route identification, including for spoil haulage, and scheduling of transport movements, particularly outside standard construction hours; (b) the number, frequency and size of construction related vehicles (passenger, commercial and heavy vehicles, including spoil management movements); (c) construction worker parking; (d) the nature of existing traffic (types and number of movements) on construction access routes (including consideration of peak traffic times and sensitive road users and parking demand and arrangements including adequate parking for sports games); (e) access constraints and impacts on public transport, pedestrians and cyclists; (f) how construction of the project affects the condition and capacity of, and the need to close, divert or otherwise reconfigure elements of the local road, cycle and pedestrian network and public carparks; (g) details on construction scheduling and management to maintain traffic capacity along President Avenue and sports field parking during construction. (h) details of how construction and scheduling of works would be	Guide to Traffic Management – Part 3 Traffic Studies and Analysis (Austroads, 2007) Guide to Traffic Generating Developments Version 2.2 (RTA, 2002) Cycling Aspects of Austroads Guides (Austroads, 2014) NSW Bicycle Guidelines v 1.2 (RTA, 2005) Planning Guidelines for Walking and Cycling (DIPNR, 2004) NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017)

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
	coordinated in regard to public events and cumulative traffic impacts resulting from concurrent work on the project and other major projects, under or preparing for or commencing construction in the vicinity of the proposal; (i) alternatives to road transport of construction spoil including rail options as well as potential re-use in proposed fill areas or in association with Resource Recovery Exceptions (if obtained from the EPA) to minimise traffic impacts on the road network; and (j) the likely risks of the project to public safety, paying particular attention to recreational users of open space in the area including Rockdale Bicentennial Park, Memorial Fields, Ilinden Sports Centre, Scarborough Park north, Barton Park and the Kogarah Golf Course. 2. The Proponent must assess and model the operational transport impacts of the project including, but not necessarily limited to: (a) forecast travel demand and traffic volumes (expressed in terms of total numbers and heavy and light vehicle numbers) for the project and the surrounding road, cycle and public transport networks; including potential shifts of traffic movements on alternate routes inside and outside the proposal area and impact of any permanent road closures directly attributable to the SSI; (b) impacts on access to and parking for commercial centres and health and education facilities within the vicinity of the project; (c) travel time analysis; (d) performance of key interchanges and intersections by undertaking a level of service analysis at key locations; (e) wider transport interactions (local and regional roads, cycling, public and freight transport); (f) induced traffic and operational implications for existing and proposed public transport (particularly with respect to strategic bus corridors and bus routes and permanent closure/relocation of bus stops) and consideration of opportunities to improve public transport; (g) impacts on cyclists and pedestrian access and safety; (h) opportunities for active transport, including new and integrated cycling and pedestrian elements connecting to surrounding networks;	

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
	(i) property and business access and on street parking; and (j) an explanation for the scope of the modelled area, including justification of the nominated boundaries. 3. The operational transport impact assessment must consider both operation of the Project (Stage 1) in isolation and as part of the overall F6 Extension Proposal, and other relevant motorway projects.	
2. 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.	1. The Proponent must undertake an air quality impact assessment (AQIA) addressing local and regional air quality impacts for construction and operation of the project in accordance with the current guidelines. 2. The Proponent must ensure the AQIA also includes the following: (a) demonstrated ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Clean Air) Regulation 2010*; (b) the identification of all potential sources of air pollution including details of the location, configuration and design of all potential emission sources including ventilation systems and tunnel portals; (c) a review of vehicle emission trends and an assessment that uses or sources best available information on vehicle emission factors; (d) an assessment of impacts (including human health impacts) from potential emissions of PM10, PM2.5, CO, NO2 and other nitrogen oxides and volatile organic compounds (e.g. BTEX) including consideration of short and long-term exposure periods; (e) consider the impacts from the dispersal of these air pollutants on the ambient air quality along the proposal route, proposed ventilation outlets and portals, surface roads, ramps and interchanges and the alternative surface road routes; (f) a qualitative assessment of the redistribution of ambient air quality impacts compared with existing conditions, due to the predicted changes in traffic volumes; (g) assessment of worst case scenarios for in-tunnel and ambient air quality, including a range of potential ventilation scenarios and range of traffic scenarios, including worst case design maximum traffic flow	Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2016) Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC, 2007) Technical Framework - Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006) In-Tunnel Air Quality (Nitrogen Dioxide) Policy (Advisory Committee on Tunnel Air Quality, 2016) Optimisation of the Application of GRAL in the Australian Context (Advisory Committee on Tunnel Air Quality, 2017)

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
	scenario (variable speed) and worst case breakdown scenario, and discussion of the likely occurrence of each; (h) details of the proposed tunnel design and mitigation measures to address in-tunnel air quality and the air quality in the vicinity of portals and any mechanical ventilation systems (i.e. ventilation outlets and air inlets) including details of proposed air quality monitoring (including frequency and criteria); (i) a demonstration of how the project and ventilation design ensures that concentrations of air emissions meet NSW, national and international best practice for in-tunnel and ambient air quality, and taking into consideration the approved criteria for the New M5 project and the In-Tunnel Air Quality (Nitrogen Dioxide) Policy; (j) details of any emergency ventilation systems, such as air intake/ exhaust outlets, including protocols for the operation of these systems in emergency situations, potential emission of air pollutants and their dispersal, and safety procedures; (k) details of in-tunnel air quality control measures considered, including air filtration, and justification of the proposed measures or for the exclusion of other measures; (l) a description and assessment of the impacts of potential emissions sources relating to construction, including details of the proposed mitigation measures to prevent the generation and emission of dust (particulate matter and TSP) and air pollutants (including odours) during the construction of the project, particularly in relation to ancillary facilities (such as concrete batching plants), tunnel spoil handling and cut and cover earthworks, the use of mobile plant, stockpiles and the processing and movement of spoil; and (m) a cumulative assessment of the in-tunnel, local and regional air quality impacts from the operation of the project and due to the operation of and potential continuous travel through existing and committed future motorway tunnels and surface roads. 3. The Proponent must undertake a landfill gas assessment in the vicinity of the President Avenue interchange and provide details on proposed	

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	methods and options for managing and mitigating impacts during construction and operation.	
3. Health and Safety The project avoids or minimises any adverse health impacts arising from the project. The project avoids, to the greatest extent possible, risk to public safety.	1. The Proponent must assess the potential health impacts from the construction and operation of the project. 2. The assessment must: (a) describe the current known health status of the potentially affected population; (b) describe how the design of the proposal minimises adverse health impacts and maximises health benefits; (c) assess human health impacts from the operation and use of the tunnel under a range of conditions, including worst case operating conditions and the potential length of existing and committed future motorway tunnels in Sydney; (d) human health risks and costs associated with the construction and operation of the proposal, including those associated with air quality, groundwater quality, odours, noise and vibration (including residual noise following application of mitigation measures), construction fatigue and social impacts (including from acquisitions) on the adjacent and surrounding areas, as well as opportunity costs (such as those from social infrastructure and active transport impacts) during the construction and operation of the proposal; (e) include both incremental changes in exposure from existing background pollutant levels and the impacts of project specific pollutant levels at the location of the most exposed receivers and other sensitive receptors (including public open space areas, sportsgrounds, child care centres, schools, hospitals and aged care facilities); (f) assess the likely risks of the project to public safety, paying particular attention to pedestrian safety, subsidence risks, flood risks and the handling and use of dangerous goods; (g) assess the opportunities for health improvement; (h) assess the distribution of the health risks and benefits; (i) include a cumulative human health impact assessment inclusive of in-tunnel users, local and regional impacts due to the operation of and	*Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards*, Commonwealth of Australia (enHealth, 2012) Air Quality in and Around Traffic Tunnels (NHMRC, 2008) Methodology for Valuing the Health Impacts of Changes in Particle Emissions (EPA, 2013) Health Impact Assessment: A practical guide (NSW Health, 2007) *Health Impact Assessment Guidelines*, Commonwealth Department of Health and Aged Care (enHealth, 2002) SEPP No. 33 - Hazardous and Offensive Development

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
	potential continuous travel through existing and committed future motorway tunnels and surface roads.	
4. Noise and Vibration - Amenity Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on acoustic amenity. 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.	1. The Proponent must assess construction and operational noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must take into consideration and address the redistribution of traffic (including on local feeder roads) and operational plant and equipment, and must include consideration of impacts to sensitive receivers and include consideration of sleep disturbance and, as relevant, the characteristics of noise and vibration (for example, low frequency noise). 2. An assessment of construction noise and vibration impacts must include: (a) the nature of construction activities (including transport, tonal or impulsive noise-generating works and the removal of operational noise barriers, as relevant); (b) the intensity and duration of noise and vibration impacts (both air and ground borne). This must include consideration of extended impacts associated with ancillary facilities and activities (and the like) and construction fatigue; (c) the identification of receivers, existing and likely under approved developments, during the construction period; (d) the nature, sensitivity and impact to receivers; (e) the need to balance timely conclusion of noise and vibration-generating works with periods of receiver respite, and other factors that may influence the timing and duration of construction activities (such as traffic management); (f) the potential for works outside standard construction hours, including predicted levels, exceedances, number of potentially affected receivers, and justification for the activity in terms of the *Interim Construction Noise Guideline* (DECCW, 2009); (g) a cumulative noise and vibration assessment inclusive of impacts from the project (including concurrent project construction activities); (h) a cumulative noise and vibration assessment of the impacts from the project and the construction of other transport infrastructure and	Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990) Assessing Vibration: a technical guideline (DEC, 2006) Interim Construction Noise Guideline (DECCW, 2009) Noise Policy for Industry (EPA, 2017) Construction Noise and Vibration Guideline (RMS, 2016) NSW Road Noise Policy (DECCW, 2011) Development Near Rail Corridors and Busy Roads – Interim guideline (DoP, 2008) Noise Mitigation Guideline (RMS, 2015) Noise Criteria Guideline (RMS, 2015) NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017)

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	development in the vicinity of the project including taking into account the installation and removal of temporary noise walls; (i) details and analysis of the predicted effectiveness of mitigation measures to adequately manage identified impacts, including cumulative impacts as identified in (g) and (h) and a clear identification of residual noise and vibration following application of mitigation measures; and (j) description of how community preferences could be taken into account in the design of mitigation measures and consider tailored mitigation, management and communication strategies. 3. The Proponent must demonstrate that blast impacts are capable of complying with the current guidelines, if blasting is required.	
5. Noise and Vibration - Structural 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. Increases in noise emissions and vibration affecting environmental heritage as defined in the *Heritage Act 1977* during operation of the project are effectively managed.	1. The Proponent must assess construction and operation noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must include consideration of impacts to the structural integrity and heritage significance of items (including Aboriginal places and items of environmental heritage) and piped infrastructure, Muddy Creek constructed channel as well as property in general. 2. The Proponent must demonstrate that blast impacts are capable of complying with the current guidelines, if blasting is required.	German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures Assessing vibration: a technical guideline (DEC, 2006)
6. Biodiversity The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity.	1. Biodiversity impacts related to the proposal are to be assessed in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR). 2. The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s. 6.12), *Biodiversity Conservation Regulation 2017* (s 6.8) and *Biodiversity Assessment Method* (BAM)	Policy and Guidelines for Fish Habitat Conservation and Management – Update 2013 (DPI, 2013) Threatened Species Survey and Assessment Guidelines Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2003)

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Offsets and/or supplementary measures are assured which are equivalent to any remaining impacts of project construction and operation.	including details of the measures proposed to address the offset obligation as follows: (a) the total number and classes of biodiversity credits required to be retired for the developments/project; (b) the number of classes of like-for-like biodiversity credits proposed to be retired; (c) the number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; (d) any proposal to fund a biodiversity conservation action; and (e) any proposal to make a payment to the Biodiversity Conservation Fund. 3. If requesting the application of the variation rules, the BDAR must contain details of what reasonable steps have been taken to attempt to obtain the required like-for-like biodiversity credits. 4. The BDAR must be prepared by a person accredited in accordance with the *Accreditation scheme for the Application of the Biodiversity Assessment Method Order 2017* under s. 6.10 of the *Biodiversity Conservation Act 2016*. 5. In accordance with section 9.1 and 9.2 of the BAM the BDAR must assess all direct and indirect impacts of the project on native vegetation, threatened ecological communities and threatened species habitat based on current records. 6. The biodiversity assessment must consider impacts on: (a) wetland vegetation communities over the entire project alignment; and (b) wetland fauna habitat. 7. The biodiversity assessment must assess cumulative impacts with current road projects such as additional impacts, prolongment of biodiversity impacts, and deferment of habitat rehabilitation works. 8. Impacts on biodiversity values that cannot be assessed using the BAM must also be otherwise assessed. The values include:	NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017) Aquatic Ecology in Environmental Impact Assessment – EIA Guideline (Marcus Lincoln Smith 2003) Constructed Wetlands Manual (DLWC 1998) Saltwater Wetlands Rehabilitation Manual (DECC 2008) http://www.environment.nsw.gov.au/research-and-publications/publications-search/saltwater-wetlands-rehabilitation-manual Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) Guidelines for developments adjoining land and water managed by OEH (OEH 2013);

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	(a) Impacts on fish habitats and nurseries within and adjoining the project area; and (b) matters of national significance listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. 9. The assessment of aquatic habitats must identify mitigation and management measures to minimise construction impacts including the spread of aquatic weeds. 10. The EIS must include design opportunities for improvement of the Rockdale Wetlands including measures to reduce the potential for de-oxygenation of and increased nutrient inputs to waters. 11. Where waterbodies are to be reconstructed, the design should be consistent with the current guidelines.	
7. Place Making and Urban Design The project design complements the visual amenity, character and quality of the surrounding environment. The project contributes to the accessibility and connectivity of communities.	1. The Proponent must identify how functional 'place' outcomes of public benefit would be achieved, including design principles and strategies that: (a) give consideration to adjacent areas identified for future urban renewal; (b) capitalise on reduced traffic volumes and reduced through traffic, particularly in and around commercial and community facilities; (c) avoid locating infrastructure, including ancillary facilities adjoining residential areas and other sensitive receivers, and justify where this cannot be achieved; (d) achieve high quality landscaping, streetscapes, architecture and design; (e) identify urban design strategies and opportunities that would enhance healthy, cohesive and inclusive communities, including in relation to accessibility and connectivity; (f) identify opportunities to enhance the visual, recreational and biodiversity values of the Rockdale Wetlands; (g) consider resulting residual land treatments, and demonstrate how the proposed hard and soft urban design elements of the proposal would be consistent with the existing and desired future character of the area (e.g. wetlands and green corridor) traversed or affected by the	Better Placed – an integrated design policy for the built environment in NSW (NSW Government Architect, 2017) AS4282-1997 Control of the obtrusive effects of outdoor lighting Beyond the Pavement: RTA urban design policy, procedures and design principles (RMS, 2014) Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW (RMS, 2012) NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017) Crime prevention and the assessment of development applications (DUAC, 2001) Crime Prevention through Environmental Design (CPTED) (Queensland Government, 2007) Disability (Access to Premises – Buildings) Standards 2010

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	project, particularly at President Avenue; (h) identify opportunities to utilise surplus or residual land, particularly for the provision of community space (passive and active recreational opportunities and facilities) and utilise key structures (such as ventilation outlets) for multiple uses i.e. integration with other structures; and (i) explore the use of Crime Prevention Through Environmental Design (CPTED) principles including natural surveillance during the design development process for elements including lighting, walkways, signage and landscaping. 2. The Proponent must describe the accessibility elements of the proposal including relevant accessibility legislation and guidelines, including: (a) Impacts on public transport infrastructure and services; (b) impacts on pedestrian and cyclist access and safety across and adjoining the proposal; and (c) opportunities to integrate and enhance accessibility including the provisions for public and active transport infrastructure as a result of the proposal. 3. The Proponent must assess the visual and landscape impacts of the proposal, including ancillary infrastructure on: (a) views and vistas; (b) streetscapes, key sites and buildings; (c) landscaping, green spaces, wetlands and existing trees and tree canopy, including an assessment of likely magnitude of impacts to trees and need for removal to be undertaken by an arborist, including the provision of measures to minimise and offset impacts; (d) heritage items including Aboriginal places, environmental heritage; and areas of heritage sensitivity; and (e) the local community. 4. The Proponent must provide visual representations of the proposal from key receiver locations to illustrate the proposal and its visual impacts.	Technical guideline for Urban Green Cover in NSW Healthy Urban Development *Checklist* (NSW Health, 2009) Cycling Aspects of Austroads Guides (Austroads, 2014) NSW Bicycle Guidelines v 1.2 (RTA, 2005) Planning Guidelines for Walking and Cycling (DIPNR, 2004) Environmental Health Risk Assessment, Guidelines for assessing human health risks from environmental hazards, Commonwealth of Australia (enHealth, 2012) Health Impact Assessment: A practical guide (NSW Health, 2007) Sydney Green Grid (Office of the Government Architect and Tyrrell Studio 2017) Draft Metropolitan Strategy for Sydney to 2031 (March 2013) Revised Draft Eastern City District Plan (Greater Sydney Commission 2017).

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8. Socio-economic, Land Use and Property The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities. 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.	1. The Proponent must assess social and economic impacts (of all phases of the project) in accordance with the current guidelines (including cumulative construction and operational impacts of the proposal and other major projects in the vicinity of the project) and in consultation with relevant land owners (such as those land owners whose property is being acquired or local residents who would be directly affected by road widening or loss of on street parking). 2. The Proponent must assess impacts from construction and operation on potentially affected properties, businesses, and recreational space users, including amenity impacts (including from cumulative and extended construction time frames and construction fatigue, particularly where use of current road project construction facilities are proposed), traffic congestion, property acquisitions/ adjustments, future land uses, restricted access, parking and business disruption, relevant statutory rights, and community severance and barrier impacts resulting from the project. 3. The Proponent must identify and assess the need for temporary and permanent relocation during construction of community facilities such as sports fields and playgrounds. 4. The Proponent must assess potential impacts on the Muddy Creek constructed channel such as damage due to subsidence. 5. The Proponent must assess potential impacts on utilities directly affected by the project (including communications, electricity, gas, fuel, stormwater, potable water and sewerage) and identify management options for impacted utilities, including its relocation or adjustment. 6. A draft Community Consultation Framework must be prepared identifying relevant stakeholders, procedures for distributing information and receiving/ responding to feedback and procedures for resolving stakeholder and community complaints during planning, design, construction and operation. Key issues that must be addressed in the draft Framework include, but are not limited to: (a) traffic management (including property access, pedestrian access and parking at sports fields);	Environmental Planning and Impact Assessment Practice Note: Socio-economic Assessment (RMS, 2013)

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	(b) landscaping/urban design matters including preservation/ provision of active transport corridors, environmental amenity, sports fields, playgrounds and passive recreational space; (c) adjustment or relocation of utilities; (d) construction activities including out of hours work; and (e) noise and vibration mitigation and management.	
9. Water - Hydrology Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised. 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). Sustainable use of water resources.	1. The Proponent must describe (and map) the existing hydrological regime for any surface and groundwater resource (including reliance by users e.g. bore water for domestic use and irrigation, and for ecological purposes and groundwater dependent ecosystems) likely to be impacted by the project, including rivers, streams, wetlands and estuaries as described in Appendix 2 of the *Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014). 2. The Proponent must prepare a detailed water balance for ground and surface water including the proposed intake and discharge locations (including mapping of these locations), volume, frequency and duration for both the construction and operational phases of the project. 3. The Proponent must assess and model the impact of the construction and operation of the project and any ancillary facilities (both built elements and discharges) on surface and groundwater hydrology in accordance with the current guidelines, including: (a) natural processes within rivers, wetlands, estuaries and floodplains that affect the health of the fluvial, riparian and estuarine systems and landscape health (such as modified discharge volumes, durations and velocities), aquatic connectivity, water-dependent fauna and flora and access to habitat for spawning and refuge; (b) impacts from any permanent and temporary interruption of groundwater flow, including the extent of drawdown, change in ground water levels, barriers to flows, implications for groundwater dependent on surface flows, ecosystems and species, groundwater users and the potential for settlement (c) changes to environmental water availability and flows; (d) direct or indirect increases in erosion, siltation, destruction of aquatic	Framework for Biodiversity Assessment – Appendix 2 (OEH, 2014) Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008) NSW Aquifer Interference Policy (DPI, 2012) NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017) Risk assessment Guidelines for Groundwater Dependent Ecosystems (Office of Water, 2012) The Guidelines for Controlled Activities on Waterfront Land (2012)

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	and riparian vegetation or a reduction in the stability of river banks or watercourses; (e) minimising the effects of proposed stormwater and wastewater management during construction and operation on natural hydrological attributes (such as volumes, flow rates, management methods and re-use options) and on the conveyance capacity of the existing stormwater systems where discharges are proposed through such systems or modifications are proposed to these systems; and (f) measures to mitigate the impacts of the proposal and manage the disposal of produced and incidental water. 4. The assessment must provide details of the landform (following completion) of the sites to be excavated or modified (e.g. portals and cut and cover works), including void management and rehabilitation measures. 5. The Proponent must identify any requirements for baseline monitoring of hydrological attributes. 6. The assessment must include details of proposed surface and groundwater monitoring. 7. The proposed tunnels must be designed to minimise impacts on aquifers, groundwater flows and groundwater dependent ecosystems.	
10. Water - Quality 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).	1. The Proponent must: (a) describe the background conditions for any surface or groundwater resource likely to be affected by the development; (b) state the ambient NSW Water Quality Objectives (NSW WQO) (as endorsed by the NSW Government [see www.environment.nsw.gov.au/ieo/index.htm]) and environmental values for the receiving waters (including groundwater where appropriate) relevant to the project and that represent the community's uses and values for those receiving waters, including the indicators and associated trigger values or criteria for the identified environmental values in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local	NSW Water Quality and River Flow Objectives at http://www.environment.nsw.gov.au/ieo/ Using the ANZECC Guidelines and Water Quality Objectives in NSW (DEC, 2006) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ ARMCANZ, 2000) Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECC, 2008)

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
	objectives, criteria or targets endorsed by the NSW Government; (c) identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point and describe the nature and degree of impact that any discharge(s) may have on the receiving environment, including consideration of all pollutants that pose a risk of non-trivial harm to human health and the environment; (d) identify the rainfall event that the water quality protection measures would be designed to treat; (e) assess the significance of any identified impacts including consideration of the relevant ambient water quality outcomes; (f) demonstrate how construction and operation of the project (including mitigating effects of proposed stormwater and wastewater management) would, to the extent that the project can influence, ensure that: – where the NSW WQOs for receiving waters are currently being met they would continue to be protected; and – where the NSW WQOs are not currently being met, activities would work toward their achievement over time; (g) justify, if required, why the WQOs cannot be maintained or achieved over time; (h) demonstrate that all practical measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented; (i) identify sensitive receiving environments (which may include wetlands/ estuarine waters upstream and downstream of the project including their catchments) and develop a strategy to avoid or minimise impacts on these environments; and (j) identify proposed monitoring locations, monitoring frequency and indicators of surface and groundwater quality. 2. The assessment should consider the results of any current water quality studies, as available, in the project catchment.	Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008)

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	3. The assessment should include concept designs for water quality treatment structures taking into account water sensitive urban design principles.	
11. Flooding The project minimises adverse impacts on existing flooding characteristics. Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure.	1. The EIS must map the following features relevant to flooding as described in the *NSW Floodplain Development Manual 2005* (NSW Government, 2005) including: (a) Flood prone land; (b) Flood planning areas, the area below the flood planning level; and (c) Hydraulic categorisation (floodways and flood storage areas). 2. The Proponent must assess and model, where appropriate, the impacts on flood behaviour during construction and operation for a full range of flood events up to the probable maximum flood (taking into account sea level rise and increased storm intensity due to climate change) including: (a) how the tunnel entries and cut-and-cover sections of the tunnels would be protected from flooding during construction works; (b) any detrimental increases in the potential flood affectation of the project infrastructure and other properties, assets and infrastructure; (c) consistency (or inconsistency) with applicable Council floodplain risk management plans; (d) compatibility with the flood hazard of the land; (e) compatibility with the hydraulic functions of flow conveyance in flood ways and storage areas of the land; (f) whether there would be adverse effect to beneficial inundation of the floodplain environment, on, or adjacent to or downstream of the site; (g) downstream velocity and scour potential; (h) impacts the development may have upon existing community emergency management arrangements for flooding. These matters must be discussed with the State Emergency Services and Council; (i) any impacts the development may have on the social and economic costs to the community as consequence of flooding; (j) any mitigation measures required to offset potential flood risks attributable to the project (these mitigation measures must be discussed with the State Emergency Services and Council where	NSW Government's Floodplain Development Manual (Department of Natural Resources, 2005) PS 07-003 New guideline and changes to section 117 direction and EP&A Regulation on flood prone land Practical Consideration of Climate Change - Flood risk management guideline (DECC, 2007)

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	appropriate). 3. The assessment should take into consideration any flood studies undertaken by local government councils, as available. 4. The EIS must assess and model the effect of the proposed development (including fill) on current flood behaviour for the 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.	
12. Soils The environmental values of land, including soils, subsoils and landforms, are protected. Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.	1. The Proponent must verify the risk of acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Risk Map) within, and in the area likely to be impacted by, the project. 2. The Proponent must assess the impact of the project on acid sulfate soils (including impacts of acidic runoff offsite) in accordance with the current guidelines and detail the mitigation measures proposed to minimise potential impacts. 3. The Proponent must assess whether the land is likely to be contaminated and identify if remediation of the land is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses. Where assessment and/or remediation is required, the Proponent must document how the assessment and/or remediation would be undertaken in accordance with current guidelines. 4. A baseline contamination assessment must be undertaken for filled land in the vicinity of the proposed cut and cover works near President Avenue. The Proponent must provide details of contamination characteristics and measures to manage this spoil, including spoil stockpile management, transport and disposal to avoid adverse impacts to land, water quality and sensitive receivers; 5. The Proponent must assess whether salinity is likely to be an issue and if so, determine the presence, extent and severity of soil salinity within the project area.	Acid Sulfate Soils Assessment Guidelines (DoP, 2008) Acid Sulfate Soils Manual (Acid Sulfate Soils Management Advisory Committee, 1998) Managing Land Contamination: Planning Guidelines SEPP 55 –Remediation of Land, (DUAP & EPA, 1998) Guidelines for Consultants Reporting on Contaminated Sites (OEH, reprinted 2011) Guidelines for the NSW Site Auditor Scheme (DEC, 2006) Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015) Urban and regional salinity – guidance given in the Local Government Salinity Initiative booklets (http://www.environment.nsw.gov.au/salinity/solutions/urban.htm) which includes *Site Investigations for Urban* Salinity (DLWC, 2002) Landslide risk management guidelines presented in Australian Geomechanics Society (2007) Soil and Landscape Issues in Environmental Impact Assessment (DLWC 2000)

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	6. The Proponent must assess the impacts of the project on soil salinity and how it may affect groundwater resources, hydrology and vegetation. 7. The Proponent must assess the impacts on soil and land resources (including erosion risk or hazard). Particular attention must be given to soil erosion and sediment transport consistent with the practices and principles in the current guidelines. 8. The Proponent must assess the impact of any disturbance of contaminated groundwater and the tunnels should be carefully designed so as not to exacerbate mobilisation of contaminated groundwater and/or prevent contaminated groundwater flow.	Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008) Other guidelines made or approved under section 105 of the *Contaminated Land Management Act 1997*
13. Heritage 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. 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.	1. The Proponent must identify and assess any direct and/or indirect impacts (including cumulative, vibration and visual impacts) to the heritage significance of listed (and nominated) heritage items inclusive of: (a) Aboriginal places and objects, as defined under the *National Parks and Wildlife Act 1974* and in accordance with the principles and methods of assessment identified in the current guidelines; (b) Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan; (c) environmental heritage, as defined under the *Heritage Act 1977* (including potential items of heritage value, conservation areas, open space heritage landscapes, built heritage landscapes and archaeology); (d) items listed on the State, National and World Heritage lists; and (e) heritage items and conservation areas identified in local and regional planning environmental instruments covering the project area. 2. Where impacts to State or locally significant heritage items or archaeology are identified, the assessment must: (a) include a significance assessment and statement of heritage impact for all heritage items (including any unlisted places that are assessed of heritage value); (b) provide a discussion of alternative locations and design options that have been considered to reduce heritage impacts;	Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) Aboriginal Cultural Heritage Consultation requirements for proponents (DECCW, 2010) Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW, 2010) NSW Skeletal Remains: Guidelines for Management of Human Remains (Heritage Office, 1998) Aboriginal site recording form Aboriginal site impact recording form Aboriginal Heritage Information Management System site registration form Application for the transfer of Aboriginal objects for safekeeping Criteria for the assessment of excavation directors (NSW Heritage Council, 2011) NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning, 1994)

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	(c) in areas identified as having potential archaeological significance, undertake a comprehensive archaeological assessment and management plan in line with Heritage Council guidelines which includes a methodology and research design to assess the impact of the works on the potential archaeological resource and to guide physical archaeological test excavations and include the results of these excavations. This is to be carried out by a suitably qualified archaeologist and is to discuss the likelihood of significant historical and Aboriginal archaeology on the site, how this may be impacted by the project, and include measures to mitigate any impacts; (d) consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence, hydrological changes (including Kings Wetland and Patmore Swamp) and architectural noise treatment (as relevant); (e) provide a comparative analysis to inform the rarity and representative value of any heritage places proposed for demolition; (f) outline mitigation measures to avoid and minimise identified impacts in accordance with the current guidelines; and (g) be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria). 3. The Proponent must identify and describe the Aboriginal cultural heritage values of the area and where this includes archaeological investigations of Aboriginal objects, this must be conducted by a suitably qualified archaeologist, meeting the minimum qualification requirements specified in section 1.6 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010). 4. Where impacts to Aboriginal objects and/ or places are proposed, or Aboriginal cultural heritage values are identified, consultation must be undertaken with Aboriginal people in accordance with the current	Assessing Heritage Significance (NSW Heritage Office, 2001) The Australia ICOMOS Burra Charter

Key Issue and Desired Performance Outcome	Requirement (specific assessment requirements in addition to the general requirements above)	Current Guidelines
	guidelines and conservation, management and impact mitigation measures must be identified. 5. The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented and any Aboriginal objects recorded as part of the assessment must be documented and notified to OEH.	
14. Sustainability The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources. Conservation of natural resources is maximised.	1. The Proponent must assess the sustainability of the project in accordance with the Infrastructure Sustainability Council of Australia (ISCA) *Infrastructure Sustainability Rating Tool* and recommend an appropriate target rating for the project. 2. The Proponent must assess the project against the current guidelines including targets and strategies to improve Government efficiency in use of water, energy and transport.	NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017) Infrastructure Sustainability Rating Tool , ISCA
15. Waste 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.	1. The Proponent must assess predicted waste generated from the project during construction and operation, including: (a) classification of the waste in accordance with the current guidelines; (b) estimates/ details of the quantity of each classification of waste to be generated during the construction of the project, including bulk earthworks and spoil balance; (c) handling of waste including measures to facilitate segregation and prevent cross contamination; (d) management of waste including estimated location and volume of stockpiles; (e) waste minimisation and reuse; (f) lawful disposal or recycling locations for each type of waste; and (g) contingencies for the above, including managing unexpected waste volumes. 2. The Proponent must assess potential environmental impacts from the excavation, handling, storage on site and transport of the waste particularly with relation to sediment/leachate control, noise and dust.	EPA's Waste Classification Guidelines (as in force from time to time) NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017) Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008)

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16. Climate Change Risk The project is designed, constructed and operated to be resilient to the future impacts of climate change.	1. The Proponent must assess the risk and vulnerability of the project to climate change in accordance with the current guidelines. 2. The Proponent must quantify specific climate change risks with reference to the NSW Government's climate projections at 10 km resolution (or lesser resolution if 10 km projections are not available) and incorporate specific adaptation actions in the design.	Australian Government's Climate Change Impacts and Risk Management – A Guide for Business and Government (2006) AS/NZS 3100:2009 Risk Management – Principles and Guidelines Technical Guide for Climate Change Adaptation for the State Road Network (RMS, in draft)
17. Hazards	1. The Proponent must describe the process for assessing the risk of emissions from ventilation facilities on aircraft operations taking into consideration the requirements of the *Airports Act 1996* (Commonwealth) and the *Airport Regulations 1997*.	