

Table 4.14 indicates that microtunnelling would comply with the criteria if the tunnelling machine is at a distance of approximately 10m or more from the structure. Trenchless construction would comply with the vibration criteria along the majority of the refined route as most residences within this section are in excess of 10m from the microtunnel alignment.

Predicted regenerated noise impacts from vibration

Regenerated noise occurs when ground borne vibrations are transmitted to a building structure and cause sympathetic vibration of slabs or other elements of that structure, which subsequently radiate noise within the building.

Condition 2.5b of the Project Approval states that:

With respect to ground-borne noise, a construction noise goal of:

- i) 45dB(A) ($L_{\text{Aeq}(15\text{-minute})}$) between the hours of 7:00 am and 6:00 pm;
- ii) 40dB(A) ($L_{\text{Aeq}(15\text{-minute})}$) between the hours of 6:00 pm and 7:00 am; except where ground-borne noise is predicted to occur for more than seven consecutive days in which case, 35dB(A) ($L_{\text{Aeq}(15\text{-minute})}$) between the hours of 10:00 pm and 7:00 pm applies.

Ground-borne noise is to be assessed within any habitable room.

Ground borne vibration is very site specific and actual transmission will vary along the route. Previous studies (eg Epping to Chatswood section of the Parramatta Rail Link) indicate that regenerated noise levels during tunnelling construction works are approximately 50 dB(A) when within 20m of the dwellings foundations. Based on the previous studies, residents along Euston Lane, Maddox Street and Ashmore Street may be affected by increased noise levels as a result of regenerated noise from trenchless construction. However, it should be noted that the previous studies were based on the use of a tunnel boring machine (TBM), and as such it is reasonable to assume that the trenchless construction in this area will result in less regenerated noise than works involving a TBM. The WDA would aim to ensure that construction activities comply with this goal.

4.4.3 Management Measures / Conclusion

Potential impacts for noise and vibration will be managed by implementing Condition 5.2b of the Project Approval and Statement of Commitment 10 and 11. These require preparation of a Construction Noise Management Plan to detail how construction noise and vibration will be managed. Statement of Commitment 33 will also be implemented to manage potential construction related damage to properties, structures and infrastructure from impacts such as vibration. Impacts will also be managed by undertaking the works in accordance with conditions 2.2, 2.3, 2.4, 2.5, 2.6, 4.3 and 5.2b of the Project Approval. Statement of Commitment 37 and 38 also require communications processes to be implemented to ensure that the community and stakeholders have a high level of awareness of all processes and activities associated with the delivery system.

Overall, the proposed refinements will reduce the noise and vibration impacts experienced, due to the reduced number of receivers impacted. Residents in Areas 1, 3 and 4 will experience similar levels of impact compared to the PPR. New receivers in Area 2 will experience noise impacts, with mitigation, which are similar to those presented in the EA and PPR. Importantly, conservative noise and vibration criteria and assessment methods have been used, and actual impacts are likely to be less than those predicted. It is considered that new Statements of Commitment for potential noise and vibration impacts are not required.

4.5 Flora and fauna

4.5.1 Summary of the Approved Project

An assessment of the potential impacts on terrestrial flora and fauna was undertaken for the EA and PPR. The assessment found that this section of the route supported limited fauna habitat. Vegetation along this section of the route is primarily planted roadside vegetation, modified urban environment or an industrial environment. No threatened flora was identified within the area during the surveys.

The PPR route through Sydney Park would have required some vegetation clearance associated with the trenching works and construction compound.

4.5.2 Assessment of the Modified Project

Potential impacts on flora and fauna associated with the proposed refinements will be limited to vegetation disturbance and some tree clearing at the launch and reception pit compounds along Euston Road. These areas were assessed in the PPR, and are generally characterised by weeds and exotic species, are of negligible ecological importance, and have been disturbed as part of previous activities on the sites. The pits within Sydney Park (near Euston Road) will be located to minimise potential impacts on existing vegetation, where possible.

The refinements to the route would not require the clearance of any areas of undisturbed remnant vegetation. No impacts to threatened flora or fauna are considered likely.

4.5.3 Management Measures / Conclusion

Overall, there would be substantially less impacts to flora and fauna, compared with the PPR route through Sydney Park, and a similar level of impact compared to the Euston Road PPR route. Potential impacts on terrestrial flora and fauna will be managed by implementing Statements of Commitment 8, 14, 15, 16, 17 and 25. Impacts will also be managed by undertaking the works in accordance with condition 2.26 of the Project Approval. No additional Statements of Commitment are considered necessary for the proposed refinements.

4.6 Heritage

4.6.1 Summary of the Approved Project

Indigenous

The PPR concluded that impacts to indigenous heritage within this section of the route were unlikely as much of the ground along the route has been subject to previous disturbance from urban and industrial development, and no sites were identified during the assessment.

Non-Indigenous

Table 4.15 lists the heritage items and places adjacent to the PPR routes.

Table 4.15 Heritage items and places adjacent to the PPR routes.

Item	Location	Listing
The Cooper Estate (Heritage Conservation Area)	Area bounded by Mitchell Road, Fountain Street, Euston Lane and Huntley Street, Alexandria	South Sydney LEP
Erskineville Oval (Heritage Conservation Area)	Area bounded by Ashmore Street, Binning Street, Henderson Road and Mitchell Road, Erskineville	South Sydney LEP
Malcolm Estate Conservation Area	Area bounded by Railway Parade, the northern boundary of No.2 Sydney Street, Ada Lane, the western boundary of No.54 Swanson Street, Binning Street, Ashmore Street (including Nos. 1-55) and Bridge Street (including Nos. 23-31)	South Sydney LEP
Frank G Spurway Pty Ltd industrial building	48 Euston Road	South Sydney LEP
House	Lot 105 (corner Harley and Lawrence Streets)	South Sydney LEP
Shop/dwelling	Lot 209 (corner Harley and Belmont Streets)	South Sydney LEP
Rockview Hotel	Lot 179-80 (corner Harley Street and Mitchell Road)	South Sydney LEP
House	Lot 202 (corner Harley and Belmont Street)	South Sydney LEP
Park/reserve	Lot 103A (corner Harley and Lawrence Streets)	South Sydney LEP
House	Lot 28 (corner Ashmore and Binning Streets)	South Sydney LEP
Erskineville Oval	Ashmore Street	South Sydney LEP

4.6.2 Assessment of the Modified Project

Indigenous

As with the PPR routes, the proposed refinements are unlikely to impact on indigenous heritage, as much of the ground along the route has been subject to previous disturbance from urban and industrial development. No known sites will be impacted by the proposed refinements.

Non-Indigenous

The proposed refinements avoid a number of the heritage items adjacent to the PPR routes. Of the heritage items listed in Table 4.15, the Cooper Estate (Heritage Conservation Area) and the Frank G Spurway Pty Ltd industrial building would be adjacent to the refined route. No other heritage items are located within the vicinity of the proposed refinements. Figure 4.6 shows the heritage items and places within the vicinity of the proposed refinements.

The Cooper Estate Conservation Area is bounded by Mitchell Road, Fountain Street, Euston Lane and Huntley Street, Alexandria. As per the PPR routes, the refined route passes through the Cooper Estate Conservation Area, namely Euston Lane and Maddox Street. The City of Sydney Plan for Building Contributions within Cooper Estate does not identify any of the buildings at the intersection of Euston Lane and Maddox Street as contributory to the heritage value of the Conservation Area. The Frank G Spurway Pty Ltd industrial building is listed as an item of local significance or as contributing items in the South Sydney LEP 1998 (now within the City of Sydney LGA). As per the PPR routes, the proposed refined route passes in close proximity to this building.

At the completion of the proposed works, the streets in which these items are located would be returned to substantially the same form and appearance that they presently have. As with the PPR routes, the proposed refinements would therefore have no adverse heritage impacts on these items, provided the recommended management measures are implemented.

In terms of the potential for operational impacts, there would be few elements visible following completion of construction. At several points along the route air valves and scour valves would be constructed. They would measure approximately 2 x 3m, have solid covers at ground level, and would be located in footpaths, road or road reserves. Should any valves be required within the Heritage Conservation Areas, they would be unobtrusive elements in the streetscape and would have no adverse heritage impact, provided the recommended management measures are implemented.

Figure 4.6: Heritage items and places – Campbell Road to Shaft 11C



The refined route will involve trenchless construction which would not have a long-term material affect on the streetscape. There is the potential for some indirect impacts to heritage from vibration, such as the Frank G Spurway Pty Ltd industrial building and buildings within the Cooper Estate Conservation Area, although this is considered unlikely (refer Section 4.4). In addition, impacts on the buildings at the intersection of Euston Lane and Maddox Street (launch/receival pit) are unlikely and these buildings are not identified as contributing to the heritage value of the area.

4.6.3 Management Measures / Conclusion

The proposed refinements would not directly impact on the Cooper Estate Conservation Area or the Frank G Spurway Pty Ltd industrial building. Statements of Commitment 20, 21, 22 and 23 will be implemented to manage potential impacts on items of indigenous and non-indigenous heritage significance. Impacts will also be managed by undertaking the works in accordance with condition 2.7b of the Project Approval. No additional Statements of Commitment are considered necessary for the proposed refinements.

4.7 Spoil management

4.7.1 Summary of the Approved Project

This section of the route was identified as containing potentially contaminated soil and groundwater, and potential acid sulphate soils. The EA and PPR identified a number of management measures to minimise spoil impacts associated with construction within this area.

Euston Road (south) was identified in the EA as an area with potentially contaminated groundwater, associated with historical industrial land use. Euston Road has also been subject to extensive filling and the PPR indicated that the area may contain contaminated fill, leachate and gas generation.

4.7.2 Assessment of Modified Project

Additional studies have been undertaken since the preparation of the EA and PPR. Geotechnical conditions along the proposed refined route are characterised by clays, siltstone, laminate and shale, and potential acid sulphate soils. The groundwater table is located approximately 2.0 - 3.0m below the ground surface.

Excavated spoil will be transported offsite for disposal in accordance with the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes* (EPA, 1999). Within areas of trenched construction, excavated spoil will be used as backfill if it is suitable for reuse.

The proposed refinements to the route will result in less spoil generation than the PPR routes, due to the:

- reduced route length of the refined route compared to the Euston Road PPR route; and,
- reduced overall length of trenching compared to the Sydney Park PPR route.

4.7.3 Management Measures / Conclusion

The refined route is 500 - 600m shorter than the PPR routes and is estimated to produce up to 6000m³ less spoil than the trenching route proposed in the PPR through Sydney Park.

Potential environmental impacts will be managed by implementing Statements of Commitment 19 and condition 5.2g of the Project Approval. No additional Statements of Commitment are considered necessary for the proposed refinements.

5 Consultation

WDA has consulted with affected stakeholders during development of the proposed refinement. This consultation has been undertaken in accordance with the project-wide Community and Stakeholder Relations Plan (CSRFP) which outlines WDA's approach to community and stakeholder relations, and the Community Stakeholder Factor Plan developed for the City of Sydney local government area (LGA). These documents form part of WDA's CEHS and identify the key stakeholders along the route, the construction activities by section, chainage and associated impacts, and the requirements and methods of community and stakeholder notification. All stakeholders requested ongoing consultation with WDA to resolve issues as additional information becomes available.

The consultation program was designed to use a variety of engagement methods to capture residents, businesses and stakeholders with the potential to be affected by the proposed refinements, and included:

- Door knocking;
- Preparation and delivery of fact sheets;
- Monthly community updates;
- Community information sessions;
- Stakeholder meetings;
- Local member briefing;
- Information on the Sydney Water website, in media, advertising and signage; and
- A "walk the route" opportunity.

Table 5.1 summarises issues raised during consultation and references the section in this document where they are addressed.

Table 5.1: Summary of issues raised by stakeholders

Stakeholder	Issue	Where addressed in this document
City of Sydney Council	- Impacts on Sydney Park included tree loss, stormwater and drainage, loss of space for recreational usage, future restoration (consistency with Master Plan) - Truck movements in and out of compounds (safety and tree loss), and traffic impacts in general - Noise from pit construction and operation - Vibration impacts on business and residential dwellings - Consistency with DCP for the area	Section 4.3 immediate vicinity of compounds Park, and only tree loss is in involve trenching through Sydney proposed refined route does not significantly less of an issue –
Macquarie Goodman	Impact on current tenants business activities and future redevelopment	Section 4.2
Invista	Impact on current tenants business activities and future redevelopment	Section 4.2

Stakeholder	Issue	Where addressed in this document
RTA	- Impact on current traffic flow - Impact on future road projects	No longer an issue – proposed route refined to avoid impacts to Euston Road Section 2.4
Euston Road Businesses	Traffic congestion on Euston Road and loss of access to properties	Section 4.3
Sydney Park users	- Reduction in recreational space - Tree loss - Construction noise and dust - Safety	These concerns were raised in response to the PPR route through Sydney Park. Minor impacts will potentially occur associated with the construction compounds at the launch/receival shafts. Section 4.4
Euston Lane and Maddox Street residents	- Noise and Vibration - Traffic (access) impacts	Section 4.3
Mitchell and Ashmore Industrial Estate tenants	Impact on current business activities	Section 4.2
Ashmore/Bridge/Harley residents and businesses	- Noise and Vibration - Traffic (access) impacts - Loss of street trees - Loss of 24 hour truck access to businesses	No longer an issue for residents in these streets – proposed refined route does not access these streets No longer an issue around construction sites Erskineville Public School

WDA will continue to consult and inform stakeholders in accordance with Statements of Commitment 38 and 39 and conditions 2.2b, 2.8, 2.10, 2.12, 2.14, 2.15, 2.16, 2.26, 4.3, 5.2b, 5.2f, 5.2g, 5.3, 5.4, 6.1 of the Project Approval.

6 Implementation

6.1 Environmental Safeguards

The environmental assessment (Section 4) undertaken for the proposed refinements indicated that there would be an overall reduction in potential impacts, with less receivers affected compared to the PPR routes. As such, the existing Statements of Commitment and Ministers Condition of Approval are considered sufficient to manage potential impacts associated with the proposed refinements. No additional or new Statements of Commitment or Conditions of Approval are considered necessary.

Relevant Statements of Commitment from the PPR which have been identified in this document have been included as Appendix C.

6.2 Tasks following approval of modification

Once the Minister for Planning approves the modification, WDA will review the terms of approval to determine whether any actions are required to ensure compliance with any additional requirements. If required, WDA would then undertake such actions including review and update of relevant:

- Information provided to stakeholders such as roads authorities, residents and businesses concerning the proposed works; and
- Management plans or procedures required by the Approvals or Statement of Commitments, including those approved by the Director-General of the Department of Planning. This process will be undertaken in accordance with the WDA procedure for Altering an Activity Approved by the Minister.

Sector	Description	Location
urban Sydney sector	Under residential streets and watercourses	From Cook Park along Tancred Avenue and under Muddy Creek to Riverine Park (Figure 10-3 of the document referred to under condition 1.1b))
	Under watercourses	Under Cooks River (near Marsh Street) to Tempe Recreational Reserve (Figure 10-3 of the document referred to under condition 1.1b))
	Under major rail infrastructure	Under Botany Freight Line (Figure 10-3 of the document referred to under condition 1.1b))
	Under major road infrastructure	Under Canal Road (Figure 10-3 of the document referred to under condition 1.1b))
	Under residential streets	Delete: From Sydney Park, near Mitchell Road, along Mitchell Road and Ashmore Street to the Junction of Ashmore and Bridge Streets (Figure 10-3 of the document referred to under condition 1.1b)) Replace with: From Sydney Park (near the intersection of Euston Road), along Euston Lane to Maddox Street and through Ashmore and Mitchell Industrial Estates (Figure 2.2 of Desalinated Water Delivery System: application for modification of Project Approval for the Urban Sydney Sector: Sydney North, dated April 2008 and prepared by the Water Delivery Alliance)

Table 1: Trenchless Technology Project Segments

Condition 2.1 – Conditions of the Project Approval
"without limiting or restricting the selection of a construction method for other parts of the project, the Proponent shall ensure that the project parts identified in Table 1 are only constructed using a trenchless technology"

Section 75W of the EP&A Act provides for the Minister for Planning to modify a project approval, with or without conditions. WDA has assessed the environmental impacts associated with the proposed refinements and suggests the following modification to Condition of Approval 2.1:

Overall, the proposed refinements will provide a reduction in environmental and social impacts compared with the PPR routes approved for construction.

This application for modification has been prepared to seek modification of MCoA 2.1 of the Project Approval and to assess the environmental impacts of the proposed refinements to the route for the water distribution pipeline within the Urban Sydney Sector of the route, between Campbell Road, Alexandria and Shaft 11C, Erskineville.

The proposed refinements involve primarily trenchless construction under Euston Road from Campbell Road to Sydney Park Road then under Euston Lane, Maddox Street and the Ashmore/Mitchell Industrial Estates. A short section of either trenchless or trenched construction is proposed from within the Industrial Estate to connect with Shaft 11C. The refinement reduces the area and number of receivers impacted and the impacts are generally similar to or less than the PPR routes. The exception is a new area impacted by the launch/receiver pit at the intersection of Maddox Street and Euston Lane where noise levels are predicted to exceed the construction noise goals. However management measures including an enclosure will be implemented to minimise impacts as far as practicable.

Overall, the proposed refinements will provide a reduction in environmental and social impacts compared with the PPR routes approved for construction.

7 Conclusion

Appendices

- A – Summary of Consistency Assessment**
- B – Copy of Project Approval 07_0054**
- C – Relevant Statements of Commitment**

Appendix A – Summary of Consistency Assessment

Appendix A – Summary of Consistency Assessment

A.1 Consistency with the Concept Approval

The following sections assess consistency with the Concept Approval. The Concept Approval includes a number of conditions that relate to administrative conditions, compliance tracking, community information consultation and involvement, complaints management and environmental management. The following sections only address those conditions relevant to the proposed changes in the context of the approved project.

A.1.1 Schedule 1

As stated in Schedule 1 of the Concept Approval, on 16 November 2006, the Minister for Planning approved the concept of:

'Construction and operation of a desalination plant on the Kurnell Peninsula and associated infrastructure for the supply of an annual daily average production of up to 500 megalitres of drinking water per day, including:

- a) Intake and outlet pipelines to draw raw seawater into the plant and return seawater concentrate to the ocean (including tunnelling under Botany Bay National Park);
- b) Pipelines and/or tunnels from the plant across Botany Bay to the Sydney Water Corporation water supply system for the distribution of drinking water;
- c) Connection of the plant to the electricity grid; and
- d) Temporary laydown areas for construction use.

The refinements are consistent with the concept defined by the Concept Approval (Schedule 1) in that the delivery system will be able to supply up to an annual daily average of 500ML of desalinated water per day. It is consistent with item (b) above as it involves a pipeline from the plant to Sydney Water's water supply system. It also requires the use of temporary laydown areas for construction use, thereby evidencing consistency with item (d) above.

Items a) and c) above do not relate to the delivery system and so are not relevant to this consistency assessment.

A.1.2 Schedule 2 – Condition 1.1

Condition 1.1 requires that:

The Proponent shall carry out the concept plan and all related projects generally in accordance with the:

a) *Major Project Application 05_0082;*

- b) Environmental Assessment of the Concept Plan for Sydney's Desalination Project, dated November 2005, and prepared by Sydney Water Corporation;
- c) Sydney's Desalination Project, Preferred Project Report, dated August 2006, and prepared by Sydney Water Corporation; and
- d) The conditions of this approval.

The following sections discuss whether the proposed refinements are generally in accordance with these documents.

Condition 1.1(a) - Major Project Application

The Major Project Application dated 10 November 2005 and its attachment (Sydney's Desalination Project; Major Projects Application Attachment; Project Description Report), contains the following three key references to the delivery system:

- On page 2 of 4 – 'pipelines and/or tunnels from the plant across Botany Bay to the Sydney Water Corporation water supply system for the distribution of drinking water';

The refinements are consistent with this reference as the project involves a pipeline from the plant to the existing water supply system for the distribution of drinking water.

- On page 2 of the attachment – 'infrastructure to deliver water to the existing distribution network, allowing any of the following:

- 50 ML/day delivered locally to Carlingbah;
- 125 ML/day delivered to Kyeeemagh and then to the existing distribution network; and
- Up to 500 ML/day delivered to the major water distribution system consisting of the City and Pressure Tunnels via a pipeline or tunnel across Botany Bay;

The proposed refinements are consistent with this reference as the project involves delivery of up to an annual daily average of 500 ML/day of desalinated water to the City Tunnel via a pipeline.

- On page 3 of the attachment – 'to date, two water distribution methods (that is, distribution route and method of construction) are under consideration to connect the desalination plant to the water network. A pipeline and/or a tunnel could be used to distribute the water. Figures 1.2 and 1.3 show examples. Other distribution methods will be considered. Alternative distribution methods may arise during the detailed design process. Decisions on the route and method of construction will be made during detailed design.'

Figures 1.2 and 1.3 of the Major Project Application were indicative of concepts under consideration at that stage of the project and are no longer reflective of the project. These concepts have been refined during the course of subsequent investigations as part of the:

- EA of the Concept Plan;
- Blueprint Design;

- EA for the Delivery System;
- PPR for the Desalinated Water Delivery System; and
- Detailed design following receipt of the Project Approval.

Page 3 of the attachment acknowledged the need for this refinement, in particular that decisions on the route will be made during detailed design. The refinements to the route are proposed due to the availability of this additional information.

On the basis of the above, it is considered that the proposed refinements are generally in accordance with the Major Project Application.

Condition 1.1(b) - Environmental Assessment of the Concept Plan for Sydney's Desalination Project
Section 2.1 (page 2.2) of the EA of the Concept Plan identified one of the main components as being:

'Infrastructure to deliver water to the existing distribution network, allowing any of the following:

- 50 ML/day delivered locally to Carlingbah;
- 125 ML/day delivered to Kyoomagh and then to the existing distribution network; and
- Up to 500 ML/day delivered to the major water distribution system consisting of the City and Pressure Tunnels via a pipeline or tunnel across Botany Bay.'

The proposed refinements are consistent with this reference as desalinated water will be delivered to the major water distribution system.

Section 2.1 of the EA for the Concept Plan also states that:

'To date, two water distribution methods (that is, distribution route and method of construction) are under consideration to connect the desalination plant to the water network. A pipeline and/or tunnel could be used to distribute the water. Figures 2.2 and 2.3 show examples of routes that have been investigated. Other distribution methods will be considered.

Alternative distribution methods may arise during the detailed design process. Decisions on the route and method of construction will be made during detailed design.

The precise details of the site layout, distribution routes and other infrastructure will not be available until further investigation and design are undertaken as part of the detailed design in the project procurement strategy. This will be subject to the applicable environmental approval process.

For a 125 ML/day plant, pipes of horizontal directional drilling could be used to distribute water locally from Kyoomagh. Two possible routes are shown in Figure 2.2 but only one will be required. For a plant delivering more than 125 ML/day, a tunnel will be required to deliver the additional water to the city's major distribution network. Figure 2.3 shows possible tunnel routes. Again, only one route would be required.'

Section 2.1 of the EA of the Concept Plan states that the delivery infrastructure presented therein is indicative and intended to be refined during subsequent design stages. A range of studies, assessments and investigations were undertaken during development of the Blueprint Design, EA of the delivery system, PRR for the delivery system, and following Project Approval being granted for the desalinated water delivery system. The studies, assessments and investigations have refined aspects of the route. The main refinements are described in Section 2.3 of the Application for Modification and have not altered the overall concept of delivering desalinated water to the water supply system using pipelines.

On the basis of the above, it is considered that the proposed refinements are generally in accordance with the EA of the Concept Plan.

Condition 1.1(c) - Preferred Project Report for Sydney's Desalination Project

Chapter 1.4 of the PPR for Sydney's Desalination Project (August 2006) outlined the following refinements to the delivery system proposed in the EA of the Concept Plan:

- A tunnel may not be required for a plant greater than 125 ML/day. Methods to deliver greater than 125 ML/day include one or more pipelines once across Botany Bay or a tunnel, both of which were described in the EA of the Concept Plan; and
- A pipeline to Miranda/Caringbah will not now form part of the project, as water can be supplied across Botany Bay more cost effectively.

Section 1.1.2 of the PPR for Sydney's Desalination Project stated that:

"Sydney Water will seek subsequent Project Approvals for the remaining components of the desalination project, namely the desalinated water distribution methods (that is, distribution route and method of construction) from the desalination plant. This will be sought at a time that would allow construction to commence when storages are depleted to around 30 percent. Further studies, investigations and assessments will occur to better understand constraints and identify the preferred delivery route(s)."

Further studies, investigations and assessments were undertaken following exhibition of the EA of the Concept Plan. The results of these investigations were considered when refining the project, culminating in the development of the project using an approach that remains consistent with that presented in the PPR for Sydney's Desalination Project.

The project, including the proposed refinements, is consistent with that presented in the PPR for Sydney's Desalination Project as:

- A tunnel is not required and a pipeline is able to cater for the ultimate design capacity of the desalination plant of 500 ML/day; and
- It does not involve a pipeline to Miranda/Caringbah.

Condition 1.1(d) – Conditions of the Approval

Condition 1.1d of Schedule 2 requires that the project be consistent with the requirements of the Concept Approval. There are a number of Conditions of Approval that do not relate to the design or assessment of the project. These are:

- Administrative conditions (Condition 1);

- Compliance monitoring and tracking (Condition 3);
 - Community information, consultation and involvement (Condition 4); and
 - Environmental management (Condition 5).
- Where relevant, these conditions were incorporated into the Statement of Commitments in the PPR to ensure consistency with the Concept Approval.

Condition 2.1 (schedule 2) of the Concept Approval specifies assessment requirements for the project (refer to Table 3.1). These requirements were addressed by the EA and PPR for the desalinated water delivery system. In instances where the project has been refined since submission of the PPR, the table also refers to the section of the Application for Modification where the requirements are addressed.

Table 3.1 Environmental assessment requirements

Requirement (as per condition 2.1 of the Concept Approval)		Consistency assessment
(a) details of the project, including route, capacity and proposed construction methods	The route and construction method is detailed in Section 2 of the Application for Modification. The capacity is detailed in the PPR.	
(b) a detailed project-specific Statement of Commitments, consistent with the Statement of Commitments prepared for the Kurnell Desalination Plant concept plan, with a clear indication of any new or amended commitments relating to the project	Chapter 11 of the PPR.	
(c) a demonstration that the project is consistent with the requirements of this approval and generally consistent with the scope and intent of the concept outlined in the documents under condition 1.1 of this approval	This appendix.	
(d) a demonstration that the project has been designed to take into account and, where relevant, mitigate against, the impacts of wave action and coastal processes both on project integrity and as a result of the project on surrounding areas	Not relevant to the proposed refinements.	
(e) a demonstration that the project has been designed to minimise the loss of seagrasses during the construction and operation of the project	Not relevant to the proposed refinements.	
(f) a framework Compensatory Seagrass Package, developed in consultation with the DPI, detailing a framework for how any loss of seagrass associated with the DPI, including a framework for how any loss of seagrass associated with the DPI, shall be offset. The Package shall include consideration of new and/or protected seagrass areas, or other compensatory measures agreed by the DPI, commensurate with the extent of seagrass impacts. The Package shall also consider how the compensatory measures will be implemented, timing for any proposed works, responsibilities for on-going maintenance and monitoring and funding arrangements	Not relevant to the proposed refinements.	
(g) a demonstration that the project has been designed to minimise water quality impacts particularly turbidity in Botany Bay	Not relevant to the proposed refinements.	

Requirement (as per condition 2.1 of the Concept Approval)	
Consistency assessment	(h) a comprehensive water quality impact assessment for the project, undertaken in consultation with the Department of Environment and Conservation (DEC) and DPI, considering how the project will be constructed and operated to meet the outcomes specified in Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000) and to contribute to the achievement of the objectives in Marine Water Quality Objectives for NSW Ocean Water (DEC, 2006). The assessment shall make specific references to the prevention of adverse impacts on the Towra Point Reserve and commercial and recreational fishing activities in and around Botany Bay
	(i) an assessment of potential noise and vibration impacts associated with construction of the project, and how these impacts will be mitigated, monitored and managed
Chapters 7 and 9 of the EA, Chapters 5, 6 and 7 of the PPR, and Section 4.4 of the Application for Modification.	

A.2 Consistency with the Project Approval

The following sections assess consistency with the Project Approval. The Project Approval includes a number of conditions, however not all are relevant to the proposed refinements to the route. These conditions relate to matters such as, but not limited to:

- Specific environmental conditions (Condition 2);
- Botany Bay Cumulative Impacts and Coordination (Condition 3);
- Environmental Monitoring and Auditing (Condition 4);
- Environmental Management (Condition 5); and
- Environmental Reporting (Condition 6).

The following sections only address those conditions relevant to the proposed refinements in the context of the approved project. Condition 1 was considered relevant to this consistency assessment and is assessed below.

In addition, WDA will review the Project Approval to determine whether information such as procedures and management plans required by Conditions 2 - 6 need to be amended to meet compliance obligations.

A.2.1 Condition 1.1 – Terms of the Project Approval

The Project Approval does not define the project for which approval was sought and Condition 1.1 requires that:

The Proponent shall carry out the concept plan and all related projects generally in accordance with the:

- a) Environmental Assessment of the Desalinated Water Delivery System, dated April 2007, and prepared by GHD on behalf of the Proponent;
 - b) Desalinated Water Delivery System: Preferred Project Report, dated August 2007, and prepared for Sydney Water Corporation;
 - c) The concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and
 - d) The conditions of this approval.
- Consistency with the documents (a), (b) and (d) is discussed below. Section A.1.2 above discussed consistency with document (c).

Condition 1.1(a) - Environmental Assessment of the Desalinated Water Delivery System

The delivery system was described in Chapter 5 of the EA for the delivery system. Section 5.2 of the EA described the route and stated that "the route shown is indicative and does not preclude the constructor from refining it as part of the detailed design process. This may need to occur due to the need to:

- Avoid ground conditions or services that present significant construction difficulties;

- Reduce construction timeframe; or

- Reduce environmental or social impacts on residents and businesses."

Section 5.3 of the EA for the delivery system described the construction methods and stated that:

Indicative construction methods are described in Sections 5.3.2 and 5.3.3. The methods described do not preclude the constructor from using alternative methods or extending the range of application of any particular method to a wider area. The overriding requirement will be that the method employed results in an environmental impact no greater than indicated by this environmental assessment. Criteria for selection of the construction method include:

- Maintenance of access to adjacent properties (including residences and businesses);

- Geotechnical conditions;

- Construction time;

- Environmental impact; and

- Construction cost.

Sections 5.2 and 5.3 of the EA clearly reflect that the route described in the EA for the delivery system were indicative and intended to be optimised during detailed design. The proposed refinements are consistent with this intention.

Condition 1.2 states that in the event of any inconsistency between the documents identified in condition 1.1(a) and 1.1(b), the most recent document prevails to the extent of the inconsistency. Chapter 2 of the PPR

refined the route in the Urban Sydney Sector from that presented in the EA for the delivery system. As such, the PPR prevails over the EA to the extent of any inconsistency. The following section assesses the consistency of the proposed refinements with the PPR.

Condition 1.1 (b) – Desalinated Water Delivery System Preferred Project Report

Chapter 10 of the PPR defined the project for which Sydney Water sought approval. This was based on the project described in Chapter 5 of the EA as refined and changed by Chapter 2 of the PPR. As required by Section 5.2 of the EA, refinements to the route were made to:

- Avoid ground conditions or services that present significant construction difficulties;
- Reduce construction timeframe; or
- Reduce environmental or social impacts on residents and businesses.

Chapter 10 of the PPR included refinements to the route. Section 5.3 of the EA stated that the construction method may need to be refined during the detailed design provided that "the method employed results in an environmental impact no greater than indicated by this Environmental Assessment". Section 4 of the Application for Modification compares the potential environmental impacts of the proposed refinement with the project described in Chapter 10 of the PPR.

During preparation of the PPR it was envisaged that further refinements may be required during detailed design. To accommodate this scenario, Chapter 2 of the PPR outlined "indicative refinements to the route and changes to the construction method relative to the project presented in the Environmental Assessment" that were subsequently included in Chapter 10 of the PPR. These refinements were not considered to be final as further environmental and engineering investigations were required to be undertaken to inform the detailed design, hence their "indicative" status. The project description therefore made provision for refinements during detailed design.

Furthermore, Section 10.1 of the PPR states that "In summary the indicative route is described in Table 10.1 and Figures 10.1, 10.2 and 10.3". It also states that the delivery system will:

- Be generally located on the alignment indicated in Figure 10.1, Figure 10.2 and Figure 10.3;
- Be generally constructed using a combination of trenchless and trenched construction methods as indicated in Figure 10.1, Figure 10.2 and Figure 10.3.

Figure 10.3 of the PPR relates to the Urban Sydney Sector and is described in Table 10.1 of the PPR. From Sydney Park to Shaft 11C, this section seeks approval for two routes, only one of which will be constructed, as follows:

- Trenchless under Euston Road, Harley Street and Ashmore Street.
- Trenched through a corridor on the east side of Sydney Park to Sydney Park Road. Then trenchless along Mitchell Road to Ashmore Street.

Both PPR routes finish with trenchless from Ashmore Street to Bridge Street, with trenched construction along the final section of Bridge Street to Shaft 11 C.

Figure 2.1 of the Application for Modification displays the route presented in Figure 10.3 of the PPR. Figure 2.2 displays the proposed refinements described in Section 2 of the Application for Modification. The proposed refinements are considered to be generally consistent with the project as described in Chapter 10 of the PPR because Chapter 10 stated that the route described in Table 10.1 and Figures 10.1, 10.2 and Figure 10.3 was "indicative" and that the delivery system will be "generally located on the alignment indicated in Street then into the Ashmore and Mitchell Industrial Estates, two routes were identified in the PPR, and the proposed refinement partially follows one of these routes. Overall, the refined route reduces both the number of streets affected, the distance of the route within the Urban Sydney Sector and the overall length of the pipeline. For these reasons, it is considered to be "generally" along the "indicative" route.

The proposed refinements are consistent with the PPR as:

- Chapter 10 of the PPR states that the route is "indicative";
- Figure 10.3 includes two possible routes through the Urban Sydney Sector and Section 2.7 of the PPR outlines evaluation criteria to be used to select the preferred option. The overriding requirement to be considered when selecting the preferred option continues to be "...that the method employed results in an environmental impact no greater than indicated by this environmental assessment".
- Similar parcels of land are affected as would have been impacted by the route in the PPR. As such, the changes are "generally" along the "indicative" alignment in Chapter 10 of the PPR; and

Section 4 of the Application for Modification assesses the potential environmental impacts of the proposed refinements and concludes that overall, the refinements will reduce potential environmental impacts relative to those described in the PPR. Potential impacts are able to be managed by implementing the Minister's Conditions of Approval and Statement of Commitments. As such, the refinements are consistent with the Statement of Commitments and the Statement of Commitments do not require modification.

Condition 1.1(c) – Concept Plan granted approval with respect to the Kurnell Desalination Plant concept plan (05_0082)

Condition 1.1(c) is addressed in Section A.1.2 of this Appendix.

Condition 1.1(d) – Conditions of the Project Approval

Condition 2.1 is the only condition within the Project Approval that stipulates routes for the delivery system and the application of construction methods. Condition 2.1 requires that trenchless construction be undertaken at various locations along the route and states that:

"without limiting or restricting the selection of a construction method for other parts of the project, the Proponent shall ensure that the project parts identified in Table 1 are only constructed using a trenchless technology"

Table 1: Trenchless Technology Project Segments

Sector	Description	Location
Urban Sydney Sector	Under residential streets and watercourses	From Cook Park along Tancred Avenue and under Muddy Creek to Riveline Park (Figure 10-3 of the document referred to under condition 1.1b))

	Under watercourses	Under Cooks River (near Marsh Street) to Tempe Recreational Reserve (Figure 10-3 of the document referred to under condition 1.1b))
	Under major rail infrastructure	Under Botany Freight Line (Figure 10-3 of the document referred to under condition 1.1b))
	Under major road infrastructure	Under Canal Road (Figure 10-3 of the document referred to under condition 1.1b))
	Under residential streets	From Sydney Park, near Mitchell Road, along Mitchell Road and Ashmore Street to the Junction of Ashmore and Bridge Streets (Figure 10-3 of the document referred to under condition 1.1b))

Within the Urban Sydney Sector covered by this assessment, Table 1 of the Project Approval requires that trenchless construction be undertaken under residential streets from Sydney Park, along Mitchell Road and Ashmore Street to the Junction of Ashmore and Bridge Streets, and refers to Figure 10.3 of the PPR. While trenchless construction is proposed from Sydney Park, the refined route passes under different streets, namely, Euston Lane and Maddox Street, then into the Ashmore and Mitchell Industrial Estates.

While this alignment is considered to be generally consistent with the PPR (refer Condition 1.1b above), as Condition 2.1 specifies the residential streets in which trenchless construction must be undertaken, the WDA considers the refined route is inconsistent with Condition 2.1 and has prepared an Application for Modification to obtain approval for the refined route (refer Figure 2.2 of the Application for Modification).

Condition 2.1 should be modified to amend the streets identified in Table 1 of the Project Approval for trenchless construction under residential streets of the Urban Sydney Sector, as follows:

Existing approval text (Condition 2.1)	Proposed amendment to text
From Sydney Park, near Mitchell Road, along Mitchell Road and Ashmore Street to the Junction of Ashmore and Bridge Streets (Figure 10-3 of the document referred to under condition 1.1b))	From Sydney Park (near the intersection of Euston Road), along Euston Lane to Maddox Street and through Ashmore and Mitchell Industrial Estates (Figure 2.2 of Desalinated Water Delivery System: application for modification of Project Approval for the Urban Sydney Sector: Sydney North, dated May 2008 and prepared by the Water Delivery Alliance)

Appendix B – Copy of Project Approval 07_0054

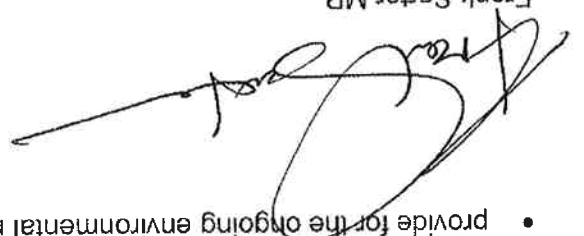
Project Approval

Section 75J of the Environmental Planning and Assessment Act 1979

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.



Frank Sartor MP

Minister for Planning

Sydney 22nd Oct 2007

File No: 9039739

SCHEDULE 1

Application No:

07_0054

Proponent:

Sydney Water Corporation

Approval Authority:

Minister for Planning

Project:

"the desalinated water delivery system" project

Concept Plan:

the project is a component of the approved concept plan for the Kurnell Desalination Plant (05_0082)

Part 3A Project:

On 25 October 2005, the Minister for Planning formed the opinion pursuant to clause 6 of State Environmental Planning Policy (Major Projects) 2005 that the proposal is for the purpose of development described in clause 25(2) of Schedule 1 to that Policy. The proposal is thus declared to be a project to which Part 3A of the Environmental Planning and Assessment Act 1979 applies.

Concept Plan Authorisation:

On 16 November 2005, the Minister for Planning authorised the submission of a concept plan for the proposal.

Critical Infrastructure:

On 16 November 2005, the Minister for Planning formed the opinion pursuant to clause 6A of the State Environmental Planning Policy (Major Projects) 2005 that the proposal is for the purpose of development described in Schedule 5 to that Policy (clause 1 – Kurnell desalination project). The proposal is thus declared to be a critical infrastructure project within the meaning of section 75C of the Act.

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SCHEDULE 2

Act, the	<i>Environmental Planning and Assessment Act 1979</i>
Conditions of Approval	The Minister's conditions of approval for the project
DECC	Department of Environment and Climate Change
Department, the	Department of Planning
Director-General, the	Director-General of the Department of Planning, or delegate.
DPI	Department of Primary Industries
EA	<i>Environmental Assessment of the Desalinated Water Delivery System</i> , dated April 2007, and prepared by GHD on behalf of Sydney Water Corporation
Minister, the	Minister for Planning.
Proponent	Sydney Water Corporation, or any party acting under authorisation from and on behalf of the Sydney Water Corporation
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
RTA	NSW Roads and Traffic Authority
Site	The land to which this approval applies

1. ADMINISTRATIVE CONDITIONS

Terms of Project Approval

- 1.1 The Proponent shall carry out the project generally in accordance with the:
- Environmental Assessment of the Desalinated Water Delivery System*, dated April 2007, and prepared by GHD on behalf of the Proponent;
 - Desalinated Water Delivery System: Preferred Project Report*, dated August 2007, and prepared by Sydney Water Corporation;
 - the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and
 - the conditions of this approval.

- 1.2 In the event of an inconsistency between:
- the conditions of this approval and any document listed from condition 1.1(a) to 1.1(b) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency;
 - any document listed from condition 1.1(a) to 1.1(b) inclusive, and any other document listed from condition 1.1(a) to 1.1(b) inclusive, the most recent document shall prevail to the extent of the inconsistency.

- 1.3 Notwithstanding condition 1.2, if there is any inconsistency between this project approval and the concept plan approval for the Kurnell Desalination Plant concept plan, the concept approval shall prevail to the extent of the inconsistency.

- 1.4 The Proponent shall comply with any reasonable requirement(s) of the Director-General arising from the Department's assessment of:
- any reports, plans or correspondence that are submitted in accordance with this approval; and
 - the implementation of any actions or measures contained in these reports, plans or correspondence.

Limits of Approval

- 1.5 This project approval shall lapse on 31 December 2015, unless works the subject of this project approval or any other project approval granted with respect to the Kurnell Desalination Plant concept approval are physically commenced on or before that date. The Director-General may extend this lapse date if the Proponent demonstrates to the satisfaction of the Director-General that the desalination plant technology remains current, appropriate and reflective of best practice at the date the approval would otherwise lapse.

Project Sectors

- 1.6 For the purpose of this approval, the project shall be considered in three sectors:
- the **Kurnell Sector**, being the dry-land component of the project between the desalination plant site and Silver Beach (approximately 2.0 kilometres);
 - the **Botany Bay Sector**, being the water-based component of the project between Silver Beach and Kyeeemagh, including construction compounds at Silver Beach and Kyeeemagh (approximately 8.0 kilometres); and
 - the **Urban Sydney Sector**, being the dry-land component of the project between Kyeeemagh and Erskineville (approximately 8.3 kilometres).

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Construction Methods

- 2.1 Without limiting or restricting the selection of a construction method for other parts of the project, the Proponent shall ensure that the project parts identified in Table 1 are only constructed using a trenchless technology.

Table 1 - Trenchless Technology Project Segments

Sector	Description	Location
Kurnell Sector	Under residential streets	From under Captain Cook Drive (near the Kurnell subtransmission substation) to the corner of Tasman Street and Dampier Street, and along Dampier Street to Silver Beach (Figure 10-1 of the document referred to under condition 1.1b))
Botany Bay Sector	Under seagrass beds	From Silver Beach to a point around 800 metres from the mean high water mark into Botany Bay along the pipeline alignment (Figure 10-2 of the document referred to under condition 1.1b))
Urban Sydney Sector	Under residential streets and watercourses	From Cook Park along Tancred Avenue and under Muddy Creek to Riveline Park (Figure 10-3 of the document referred to under condition 1.1b))
	Under watercourses	Under Cooks River (near Marsh Street) to Tempe Recreation Reserve (Figure 10-3 of the document referred to under condition 1.1b))
	Under major rail infrastructure	Under Botany Freight Line (Figure 10-3 of the document referred to under condition 1.1b))
	Under major road infrastructure	Under Canal Road (Figure 10-3 of the document referred to under condition 1.1b))
	Under residential streets	From Sydney Park, near Mitchell Road, Street to the junction of Ashmore and Bridge Streets (Figure 10-3 of the document referred to under condition 1.1b))

Noise and Vibration Impacts Construction Hours

- 2.2 Construction activities associated with the Botany Bay Sector (excluding trenching activities within one kilometre of the nearest residences) (refer to condition 1.6) and those parts of the Kurnell Sector and Urban Sydney Sector employing a trenchless construction technology (refer to condition 2.1), but not including establishment of launch and retrieval pits, may be undertaken 24-hours per day, seven days per week, subject to:
- a) compliance with the relevant Construction Noise Management Plan (refer to condition 5.2b)); and
 - b) in the case of works associated with the Kurnell Sector or the Urban Sydney Sector, notification of the local council and potentially-affected residential landowners and occupiers at least 48 hours prior to any works being undertaken outside of the hours specified in condition 2.3.

- 2.3 The Proponent shall only undertake construction activities associated with the project, other than those referred to under condition 2.2, that would generate an audible noise at any residential premises during the following hours:
- a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;

likely to be affected by tunnel/ excavation works or other major vibration-inducing construction activities in the vicinity of the buildings and structures in the Kurnell Sector and the Urban Sydney Sector. A suitably qualified person is required to certify that the survey area (and the buildings surveyed within) encompasses the maximum area that

a) all buildings/ structures above the excavation/ tunnel and other buildings/ structures the project:

the following buildings/ structures prior to proximate tunnelling or excavation associated with

2.7

Impacts on Buildings and Structures

2.6 The Proponent shall ensure that the vibration resulting from construction and operation of the trenchless technology does not exceed the evaluation criteria presented in *Environmental Noise Management – Assessing Vibration: A Technical Guideline* (DEC, 2006).

Ground-borne noise is to be assessed within any habitable room.

applies.

which case, 35dB(A) ($L_{Aeq}(15\text{-minute})$) between the hours of 10:00pm and 7:00am

ground-borne noise is predicted to occur for more than seven consecutive days in

ii) 40dB(A) ($L_{Aeq}(15\text{-minute})$) between the hours of 6:00pm and 7:00am; except where

i) 45dB(A) ($L_{Aeq}(15\text{-minute})$) between the hours of 7:00 am and 6:00 pm;

b) with respect to ground-borne noise, a construction noise goal of:

apply; and

levels at sensitive receiver locations, the requirements of condition 5.2b) i) 3

level exceeding more than 5dB(A) ($L_{A10}(15\text{-minute})$) above rating background noise

of this approval. Where applying such mitigation measures results in a noise

best practice noise mitigation outside of the hours specified under condition 2.3

established on the basis of what can reasonably and feasibly be achieved using

approval;

Site Noise during the hours of construction specified under condition 2.3 of this

i) developed in accordance with the DEC's *Noise Control Guideline Construction*

a) with respect to airborne noise, a construction noise goal;

The following construction noise goals shall apply to the project:

2.5

Noise and Vibration Goals and Limits

of the works.

hours will not unreasonably impact on the acoustic amenity of receptors in the vicinity

determine that the noise impact of activities undertaken during the varied construction

d) accompanied by any information necessary for the Director-General to reasonably

and all practicable and reasonable mitigation measures will be put in place; and

potentially affected receivers and notification of the relevant local council has occurred;

during the varied construction hours are justified; appropriate consultation with

c) accompanied by written evidence to the Director-General that activities undertaken

the varied construction hours;

b) accompanied by details of the nature and need for activities to be undertaken during

a) considered on a case basis or activity-specific basis;

hours of construction shall be;

varied with the prior written approval of the Director-General. Any request to alter these

The hours of construction activities specified under condition 2.3 of this approval may be

2.4

This condition does not apply in the event of a direction from police or other relevant

authority for safety reasons or where required in an emergency to avoid the loss of lives,

property and/ or to prevent environmental harm.

c) at no time on Sundays or public holidays.

b) 8:00 am to 1:00 pm on Saturdays; and

could reasonably be expected to be affected by tunnelling/ excavation or other major vibration-inducing construction works associated with the project; and

b) all buildings/ structures of heritage significance listed in Table 9.18 of the document referred to under condition 1.1a) of this approval, unless otherwise determined following geotechnical and vibration analysis endorsed by a suitably qualified person that the building/ structure(s) is not likely to be adversely affected by tunnel/ excavation works or other major vibration-inducing construction works associated with the project.

2.8 All property owners of buildings/ structures to be surveyed, as required under condition 2.7, shall be advised at least 48 hours prior to the commencement of the survey of their property of the scope and methodology of the surveys and the process for making a claim in relation to any property damage attributable to the construction of the project. A copy of the final survey shall be provided to each affected landowner upon request. A register of all properties surveyed shall be maintained by the Proponent and provided to the Director-General upon request.

2.9 Any damage to buildings/ structures, attributable to the construction of the project, either directly and indirectly (that is, including as a result of vibration or changes in groundwater) shall be rectified by the Proponent within a reasonable period, at no cost to the owner(s).

Traffic Impacts

2.10 Prior to the commencement of construction of the Kurnell Sector and the Urban Sydney Sector, the Proponent shall provide to the relevant road authority, the following information:

a) where directional drilling/boring is proposed under roads, detailed plans (including vertical and horizontal alignment) of the pipeline route and mitigation measures proposed to reduce impacts to traffic and pedestrian safety during construction works on either side of the road. An indication of timing of works, hours of construction and maintenance arrangements during operation should also be outlined;

b) where trenching is proposed to cross roads or where trenching is proposed to occur within the road reserve, detailed design plans for the road works (including vertical and horizontal alignment) is to be provided as well as information regarding plant and equipment proposed to be used, construction compound locations, construction schedule and hours of construction, localised traffic diversions, need for short-term closure of roads or traffic lanes and restricted or modified access to adjacent properties.

c) details of all works that impact upon classified roads, including proposed mitigation measures to be implemented to reduce construction impacts such as traffic control measures for peak traffic periods (i.e. detours/diversions) and measures to ensure traffic and pedestrian safety during construction activities are required to be outlined. Ongoing maintenance arrangements for the operational phase should also be provided.

2.11 The Proponent shall ensure that any measures to restore roads to pre-existing conditions are undertaken in a timely manner, in accordance with the requirements of and to the satisfaction of the relevant road authority, at the full expense of the Proponent.

2.12 The Proponent shall ensure that all road crossings of classified roads, as defined in the Roads Act 1993, are constructed using underboring/directional drilling construction techniques unless otherwise agreed with the RTA. The construction method and depth of cover shall be determined in consultation with the RTA.

2.13 At all locations at which the project crosses:

a) an existing road corridor (or future road corridors) between the Cooks River and Campbell Road (inclusive), Alexandria,

b) at Marsh Street, along the Alexandra Canal north of the bridge crossing near the Tempe Recreation Reserve, and

c) at General Holmes Drive,

the project shall be concrete encased, or equivalent, in order to protect the project from future road transport infrastructure, in consultation with the RTA.

2.14 Prior to the commencement of construction of the Urban Sydney Sector the Proponent shall consult with the RTA with respect to construction methods, project alignment, methods for protecting the pipeline infrastructure and future on-going maintenance of the project in that area. The consultation shall specifically address and resolve the potential for the project to adversely affect the RTA's future plans for road enhancement and development in order to minimise the potential for conflicts between the project and existing and any future major road transport infrastructure.

2.15 The Proponent shall ensure that the project is designed and constructed to be maintenance free within any RTA road reservations identified in environmental planning instruments and any future corridors identified by the RTA, or as otherwise agreed with the RTA. The Proponent shall ensure that pits, valves, hydrants, access structures or other related fittings are only located within areas of the project which are not within an existing or future road corridor, or as otherwise agreed with the RTA.

2.16 The Proponent shall provide the RTA with "as built" plans of the project where it is located within classified roads, as defined under the Roads Act 1993, and RTA road corridors (existing and future), showing the horizontal and vertical alignment and provisions for the protection of the project including locations of concrete encasement, or equivalent, if applicable, within six months of completion of construction of the project within those locations.

Soil and Water Quality Impacts

2.17 The Proponent shall employ soil and water management controls to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction of the Kurnell Sector and the Urban Sydney Sector, in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

2.18 Construction and maintenance activities associated with the Botany Bay Sector shall be carried out in a manner that minimises the potential for the re-suspension and dispersal of marine sediments and associated biota, including installation of silt curtains around the Silver Beach and Kyeemagh construction sites and dredge discharge barges within the Botany Bay Sector. Silt curtains, or equivalent, shall be installed around the cutter suction dredges where monitoring demonstrates that turbidity levels at a point two metres from the cutter suction dredges, due to dredging activities, exceeds the background turbidity by more than an equivalent suspended sediment concentration of 50mg/L.

Where silt curtains have been installed, they shall remain in place until the turbidity of the water within the silt curtains returns to background levels of turbidity in waters immediately outside the silt curtains.

2.19 The Proponent shall ensure that construction of the Botany Bay Sector, including all dredging, subsurface storage and reclamation works, is carried out in a manner such that turbidity outside the silt curtains (as required under condition 2.18) does not exceed the background turbidity by more than an equivalent suspended sediment concentration of 50mg/L at a point mid-depth in the water column and a distance of two metres from the silt curtain. No visible surface plume outside the silt curtains is permitted.

2.20 All equipment associated with the construction and operation of the project shall be operated and maintained in a manner that minimises the potential for oil and grease spills/leaks.

2.21 During construction of the Botany Bay Sector, the Proponent shall ensure that equipment capable of responding to a worst case oil spill is available at all times.

a) procedures for access to, and provision of, monitoring data from each development, particularly in relation to water quality and ecological health;
b) identify and implement reasonable and feasible opportunities for coordinated and cooperative approach to the management of cumulative environmental impacts from the developments, with particular reference to water quality, noise impacts, construction traffic, dust impacts, aquatic ecology and reuse of spoil;

The Protocol shall include, but not necessarily be limited to:
cooperative monitoring and management of environmental impacts from the developments.
framework for identification of reasonable and feasible opportunities for the coordinated and cooperative monitoring and management of environmental impacts from the developments.
EnergyAustralia, as relevant, for the purposes of the development of a **Coordinated Environmental Monitoring and Management Protocol**. The Protocol shall provide a construction works coincide, the Proponent shall consult with Sydney Ports Corporation and coincident construction works between the project and those developments. Should the expansion of Port Botany) and with EnergyAustralia (with respect to the timing of construction works associated with the Botany Bay electricity cable) to identify any potential Sydney Ports Corporation (with respect to the timing of construction works associated with the commencement of construction of the project, the Proponent shall consult with 3.1

3. BOTANY BAY CUMULATIVE IMPACTS AND COORDINATION

2.28 All wastes generated by the project shall be beneficially reused, recycled or directed to a waste facility lawfully permitted to accept the materials.

Waste Management

2.27 The Proponent shall construct the project in a manner that minimises dust emissions from construction areas, including wind-blown and traffic-generated dust. All construction shall be undertaken with the objective of preventing visible emissions of dust from the site.

Air Quality Impacts

2.26 The Proponent shall ensure that all revegetation and rehabilitation works are undertaken, in consultation with the relevant local council, using locally native species. The Proponent shall ensure that the regeneration of revegetated/rehabilitated areas is managed for a period of six months, or as agreed by the Director-General, until the newly planted vegetation has fully established.

2.25 Where practicable, noisy or other potentially disturbing activities associated with the construction of the project within Botany Bay shall cease or be scaled back when cetaceans and other marine mammals are approaching or in the area of construction activities.

2.24 The Proponent shall ensure that construction and maintenance of the Botany Bay Sector, particularly dredging and land reclamation works, is carried out in a manner that minimises the potential for impacts on seagrass beds, water quality, aquatic ecology and estuarine wetland systems.

2.23 The Proponent shall ensure that construction of the Botany Bay Sector is carried out in a manner that minimises the potential for disturbance and/or the spread of *Caulerpa taxifolia*.

Impacts on Ecology

2.22 Prior to the commencement of construction of the Botany Bay Sector seaward of the mean high water mark, the Proponent shall develop work practices and procedures to be applied during construction to mitigate potential impacts on water quality and aquatic ecology. The work practices and procedures shall be consistent with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000) and shall include, but not be limited to management of sediment-bound contaminants and acid sulfate soils located along the pipeline route. The Proponent shall consult DECC and DPI in development of these work practices and procedures. The Proponent shall submit a copy of the final work practices and procedures to the Director-General, prior to their implementation.

- 4.2 Prior to the commencement of construction of the Botany Bay Sector, the Proponent shall prepare a **Beach and Foreshore Monitoring Program** to monitor the impacts of the project on beach and foreshore erosion and quality where it is likely to be materially affected by the project. The Program shall be developed in consultation with the DECC and DPI and shall include, but not necessarily be limited to:
- a) surveys of beaches and foreshore areas around Botany Bay, including those areas likely to be materially affected by the construction of the project and at least one reference site to establish baseline profiles for those areas;
 - b) monitoring of those beaches and foreshore areas around Botany Bay referred to under part a) during construction of the project and following completion of construction to identify any changes in beach and foreshore profiles;
 - c) provisions to determine "source" and "sink" areas and to ameliorate any damage to habitat determined as a "sink" area for erosion sourced sediment;
 - d) contingency measures to be implemented in the event that beach and foreshore profile changes attributable to the project are identified, and a timetable for implementation; and
 - e) provision for amelioration of any damage to beach and foreshore areas as a result of the construction of the project.

Beach and Foreshore Monitoring

- 4.1 Prior to the commencement of construction of the Botany Bay Sector seaward of the mean high water mark, the Proponent shall prepare an **Ecosystem Monitoring Program** to monitor the impacts of the project on ecosystems of Botany Bay. The Program shall be developed in consultation with the DECC and the DPI, and shall include, but not necessarily be limited to:
- a) a sampling, data collection and assessment regime to establish baseline ecological health, with particular reference to seagrasses, syngnathid species and benthic biota and for ongoing monitoring of ecological health during construction of the Botany Bay Sector. The monitoring program should include specific provisions for monitoring in and around construction works, including Towra Point Aquatic Reserve and its mangrove habitat, and should also take into account spatial variability in species types and distribution;
 - b) criteria against which the impact of the project on the ecological health of Botany Bay will be assessed;
 - c) water quality monitoring in the context of potential ecological impacts, particularly in relation to turbidity;
 - d) mitigation measures to be implemented in the event that reduced ecological health is identified with reference to established assessment criteria, including a timetable for implementation; and
 - e) monitoring for ecological health and biodiversity outcomes following completion of construction works, and for the recovery of biodiversity within the areas directly and indirectly affected by the Botany Bay Sector for a period of at least twelve months, unless otherwise agreed or directed by the Director-General.

Ecosystem Monitoring

4. ENVIRONMENTAL MONITORING AND AUDITING

- The Proponent shall provide a copy of the Protocol to the Director-General as soon as practicable after agreement on the terms of the Protocol.
- c) arrangements for communication between the parties, including designated contact persons and contact details;
 - d) notification procedures in the event of an incident at either development that may impact on the other development(s), or generate a significant common or cumulative impact;
 - e) mechanism for review of the Protocol from time to time; and
 - f) such other matters as parties may agree.

Noise and Vibration Monitoring

- 4.3 Prior to the commencement of construction of the project, the Proponent shall prepare a **Construction Noise and Vibration Monitoring Program** for the purpose of assessing compliance with the goals and limits referred to under conditions 2.5 and 2.6. The Program shall be developed in consultation with the DECC.

5. ENVIRONMENTAL MANAGEMENT

Construction Environmental Management

- 5.1 The Proponent shall apply the **Construction Environmental Management System** required to be developed under the concept approval for the Kurnell Desalination Project during construction of the project.

- 5.2 In addition to the general requirements of the Construction Environmental Management System, the Proponent shall prepare and implement the following project-specific Construction Environmental Management Plans and Protocols during the construction of the project:
- where soil testing prior to the commencement of construction identifies the presence of acid sulfate soils, an **Acid Sulfate Soil Management Plan** prepared in accordance with guidance provided in *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998);
 - a **Construction Noise and Vibration Management Plan**, in consultation with DECC, to detail how construction noise and vibration impacts would be minimised and managed, including, but not necessarily limited to:
 - as primary objectives;
 - attainment of the construction noise goals and vibration limits specified under this approval at all times;
 - where construction noise goals cannot be met, to achieve best practice noise control (including, for example, acoustic enclosures over micro tunnelling launch and receiver pits), in terms of noise level and duration of noise emissions at affected receivers at all times;
 - where the use of best practice noise control cannot substantially achieve the construction noise goals, alternative measures to resolve noise impacts on affected receivers (including, for example, temporary relocation of receivers);

- a **Construction Noise and Vibration Management Plan**, in consultation with DECC, to detail how construction noise and vibration impacts would be minimised and managed, including, but not necessarily limited to:
 - as primary objectives;
 - attainment of the construction noise goals and vibration limits specified under this approval at all times;
 - where construction noise goals cannot be met, to achieve best practice noise control (including, for example, acoustic enclosures over micro tunnelling launch and receiver pits), in terms of noise level and duration of noise emissions at affected receivers at all times;
 - where the use of best practice noise control cannot substantially achieve the construction noise goals, alternative measures to resolve noise impacts on affected receivers (including, for example, temporary relocation of receivers);
- details of construction activities and a schedule for construction works;
- identification of construction activities that have the potential to generate noise and/or vibration impacts on surrounding land and uses, particularly residential areas;
- a program for the periodic monitoring of noise emissions and vibration during construction, as required under condition 4.3;
- procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity;
- development of reactive and pro-active strategies for dealing promptly with any noise complaints, including documentation of a fast response, the completed action on a complaint and feedback from the complainant;
- a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, how the results of this monitoring would be recorded; and, if any non-compliance is detected with the goals and limits specified under this approval; and
- mechanisms to consider and address cumulative noise impacts, particularly from other construction work potentially occurring in the area;

- a **Construction Traffic Management Protocol** to detail how heavy vehicle movements associated with the project (other than in relation to spoil management) will be managed during construction. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction

traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts,

d) a **Spoil Management Plan**, consistent with the Spoil Management and Disposal Strategy required under the concept plan approval for the Kurnell Desalination Project. The Plan shall include procedures for undertaking further sediment samples at various depths along the trenched portion of the Botany Bay Sector to provide detail on particle size and quality of sediments to be disturbed;

e) a **Construction Water Management Plan** (for the Botany Bay Sector), in consultation with DECC, to detail how water quality will be managed during construction of the Botany Bay Sector, with specific reference to the minimisation and control of turbidity/suspended solids. In particular, a turbidity criterion is to be established to enable instantaneous measurements to be obtained and used operationally.

f) an **Erosion and Sedimentation Management Protocol** (for the Kurnell Sector and Urban Sydney Sector), in consultation with DECC, to detail how surface water and stormwater will be managed during construction. The Protocol shall include use of appropriately-sized stormwater controls, in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

g) a **Groundwater Management Protocol** (for the Kurnell Sector and Urban Sydney Sector), in consultation with DECC, to detail how groundwater will be managed during construction, with specific reference to identification and management of any contaminated groundwater along the pipeline route.

5.3 The Plans and Protocols referred to under condition 5.2 shall be submitted for the approval of the Director-General prior to the commencement of construction, or within such period otherwise agreed by the Director-General.

5.4 Nothing in this approval precludes the Proponent from developing the Plans and Protocols referred to under condition 5.2 as separate plans/ protocols, or as a single plan/ protocol, nor does it preclude the staging of submission of any of these plans/ protocols consistent with the staging of any construction works. Construction of the relevant component of the project must not commence until written approval of all Plans and Protocols relevant to that component of the project has been received from the Director-General.

Operation Environmental Management

5.5 The Proponent shall apply the **Operational Environmental Management System** required to be developed under the concept approval for the Kurnell Desalination Project during operation of the project.

6. ENVIRONMENTAL REPORTING

Incident Reporting

6.1 The Proponent shall notify the Director-General of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable and within 24 hours after the occurrence of the incident. The Proponent shall provide full written details of the incident to the Director-General within seven days of the date on which the incident occurred.

6.2 The Proponent shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 6.1 of this approval, within such period as the Director-General may require.

Appendix C – Relevant Statements of Commitment

Appendix C - Relevant Statements of Commitment

Land use

Desired Action	Action	Timing
Traffic and Access		
Disruption to property access, parklands, bus services, pedestrians and cyclists during construction minimised	13 Arrangements will be developed to ensure public safety and to minimise disruption to property access, parking, access to recreational areas, bus services, pedestrians and cyclists at all times where feasible for implementation during construction. This will include: a. Measures to maintain access, bus service routes and frequencies, footpaths and bicycle facilities (including routes at Kurnell and along the Cooks River) at all times where feasible; b. Arrangements to maintain access to properties or other arrangements where this is not practicable; c. Measures to assess the condition of affected parklands and repair damage caused by construction; d. Arrangements for notification and consultation if temporary changes are required; and e. Measures to separate construction work areas such as through temporary fencing to maintain safety.	Before construction commences.
Visual		
Construction work sites rehabilitated.	25 A program will be developed to minimise construction time and to progressively rehabilitate areas disturbed temporarily by construction as far as practicable to pre-work condition to mitigate visual impact.	During design (before construction commences).
Property		
Prevent or suitably mitigate potential construction related damage to structures, properties and infrastructure.	33 Design measures and management procedures will be developed for implementation during construction to prevent or suitably mitigate, damage to properties, structures and infrastructure (such as from vibration, excavation-induced settlement or from water table draw-down). This will include a process for conducting property inspections, subject to landowner agreement, and adaptation surveys, if required, on all structures at risk of impact during construction and formulation of measures to rectify property damage caused by construction at no cost to the owner. This will involve consultation with the RTA and RailCorp regarding design requirements. Detailed design information will be provided for their evaluation prior to construction commencing that may impact on their assets.	During design (before construction commences).
Utilities and Services		
Disruption to services during construction minimised and customers notified.	34 Measures will be developed for implementation during construction so that disruptions to services and utilities due to construction activities are minimised and advised to customers. This will involve consultation with utility and service providers regarding design requirements.	During design (before construction commences).
Communication Processes		
The community and stakeholders have a high level of awareness of all processes and activities associated with the delivery system; Provision of accurate and accessible	37 Communities directly impacted by construction will be provided with detailed information on the nature and timing of the proposed works including: a. Sydney Water will work with local Councils, stakeholder groups and the community to identify local issues and concerns prior to the commencement of construction to ensure that appropriate measures are put in place to mitigate local impacts; b. Measures will address issues such as access, local amenity, safety and traffic management; and c. Local communities will be consulted should site restoration works be required following construction.	During design (before construction commences).

Desired Action	Action	Timing
Information; and A high level of responsiveness to issues and concerns raised by the community.	38 Communications processes will be developed and implemented at appropriate times with impacted communities throughout delivery of the delivery system. These will include: a. Opportunities to input to mitigation measures for construction or operations; b. Methods to inform the community of the progress and performance of the project and issues of interest to the community; c. Notification of construction activities to potentially affected local residents and businesses; d. Processes to receive and manage complaints in accordance with Sydney Water's customer contract; e. Consultation with affected property owners including property inspections, where appropriate; f. Induction and training of construction personnel in communications requirements; and g. Protocols to notify stakeholders of relevant activities and any incidents should they occur.	During design (before construction commences)

Traffic

Desired Action	Action	Timing
Impact of construction activities on surrounding road network minimised.	12 A Construction Traffic Management Plan will be prepared in consultation with road authorities, to minimise construction traffic impacts on the surrounding road network and disruptions from works within roads and road reserves, such as pipeline trenching, as far as practicable, and ensure road safety is not compromised, including: a. Informing the local community and road users on changed conditions prior to commencement; b. Scheduling disruptive works outside peak commuting hours (including school start and finish times where relevant) and peak weekend times; c. Arrangements for parking (onsite where practicable) and safe access to work areas from the adjacent road network; d. Methods to reduce temporary lane closures, reduce delays and provide alternative access including temporary traffic arrangements; e. Restrictions on routes and times travelled by heavy vehicles; f. Controlling traffic in accordance with RTA Traffic Control at Work Site and AS 1742.3 1996, Traffic Control Devices for Works on Roads; g. Consulting with local communities where construction activities occur, including pipe-laying along roads and road reserves, to mitigate local issues of noise, access, working hours, safety and disruption to traffic movements; and h. Maintaining access along Captain Cook Drive and liaising with emergency services to ensure emergency response plans are not compromised.	During design (before construction commences)
Disruption to property access, parklands, bus services, pedestrians and cyclists during construction minimised	13 Arrangements will be developed to ensure public safety and to minimise disruption to property access, parking, access to recreational areas, bus services, pedestrians and cyclists at all times where feasible for implementation during construction. This will include: a. Measures to maintain access, bus service routes and frequencies, footpaths and bicycle facilities (including routes at Kurnell and along the Cooks River) at all times where feasible; b. Arrangements to maintain access to properties or other arrangements where this is not practicable; c. Measures to assess the condition of affected parklands and repair damage caused by construction; d. Arrangements for notification and consultation if temporary changes are required; and e. Measures to separate construction work areas such as through temporary fencing to maintain safety.	Before construction commences

Noise

Desired Action		Action		Timing
Construction Hours				
Construction hours of work notified and managed to minimise disturbance to local amenity.	10	Construction will be restricted to between the hours of 7am to 6pm (Monday to Friday) and 7am to 1pm (Saturdays) and at no time on Sundays and public holidays except: a. Where works are not a disturbance to nearby residences; or b. For the delivery of materials outside these hours as required by authorities for safety reasons; or c. Where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or d. Where agreement has been reached with local residents in order to reduce the duration of construction activities and / or manage other traffic, amenity or disturbance issues; or e. As otherwise necessary and in accordance with relevant authority requirements; or f. For all construction activities for the Botany Bay crossing from Silver Beach to Kyeemagh; or g. For all trenchless construction activities including the associated spoil removal; or h. If required, for all trenching through major traffic intersections. This commitment does not apply in the event of a direction from police or other relevant authority for safety or environmental reasons.	During design (before construction commences).	
	Noise and Vibration			
Construction noise disturbance of local residents and schools minimised.	11	A Construction Noise Management Plan will be prepared to detail how construction noise and vibration impacts would be minimised and managed, including, but not necessarily limited to: a. Undertaking an assessment of construction and traffic noise at the delivery infrastructure work sites and calculating project specific noise goals as follows: 1. Applying a construction noise objective in line with the Environmental Noise Control Manual (EPA, 1994) or any construction noise guidelines developed by DEC to replace that manual, as far as practicable, i.e. for activities at work sites operating for a period greater than 26 weeks (as measured by the LA10 (15 minute) descriptor) that the background LA90 noise level is not exceeded by more than 5dB(A) at any residence or other noise sensitive receiver. 2. If noise from a construction activity is substantially tonal or impulsive in nature (as described in Chapter 4 of the NSW Industrial Noise Policy), 5dB(A) will be added to the measured construction noise level when comparing the measured noise with the construction noise objective; b. Measures to limit vibration impacts on property and amenity of local residents and schools associated with construction activities in accordance with relevant Standards as far as practicable; c. Identifying reasonable and feasible noise mitigation measures, where the noise objectives cannot be achieved and addressing noisy activities such as sheet piling for implementation during construction. This will include selection of less noisy construction method, noise controls on equipment, noise mitigation barriers such as noise shielding at construction compounds, timing and notification of construction activities and/or options identified; d. Consulting with local communities where construction activities occur, including pipe laying along roadways, to mitigate local issues of noise, access, working hours, safety and disruption to traffic movements; e. Developing a construction noise monitoring program to verify noise levels from key work sites; and f. Measures to minimise disturbance to marine mammals during construction of the delivery system, including, where practicable, stopping or scaling down at risk activities when marine mammals are approaching the area of construction.	During design (before construction commences).	

Desired Action	Action	Timing
Communication Processes		
The community and stakeholders have a high level of awareness of all processes and activities associated with the delivery system; Provision of accurate and accessible information; and A high level of responsiveness to issues and concerns raised by the community.	37 Communities directly impacted by construction will be provided with detailed information on the nature and timing of the proposed works including: d. Sydney Water will work with local Councils, stakeholder groups and the community to identify local issues and concerns prior to the commencement of construction to ensure that appropriate measures are put in place to mitigate local impacts; e. Measures will address issues such as access, local amenity, safety and traffic management; and f. Local communities will be consulted should site restoration works be required following construction.	During design (before construction commences).
The community and stakeholders have a high level of awareness of all processes and activities associated with the delivery system; Provision of accurate and accessible information; and A high level of responsiveness to issues and concerns raised by the community.	38 Communications processes will be developed and implemented at appropriate times with impacted communities throughout delivery of the delivery system. These will include: i. Opportunities to input to mitigation measures for construction or operations; j. Methods to inform the community of the progress and performance of the project and issues of interest to the community; k. Notification of construction activities to potentially affected local residents and businesses; l. Processes to receive and manage complaints in accordance with Sydney Water's customer contract; m. Consultation with affected property owners including property inspections, where appropriate; n. Induction and training of construction personnel in communications requirements; and o. Protocols to notify stakeholders of relevant activities and any incidents should they occur.	During design (before construction commences).

Flora and Fauna

Desired Action	Action	Timing
Terrestrial Ecology		
No significant impact on threatened species and endangered ecological communities during construction from infrastructure routes and temporary construction sites.	8 Infrastructure routes and temporary construction sites will be located to avoid impacts on threatened species, endangered ecological communities and remnant vegetation, where practicable. Where avoiding impacts is not practicable, management practices will be developed to minimise impacts on threatened species, endangered ecological communities and remnant vegetation for implementation during construction. Measures to avoid and/or minimise impacts include: a. Developing onsite management practices to reduce impacts associated with trenching and trenchless technology pits; b. Further flora and fauna assessments if routes are refined to reassess impacts on biodiversity in accordance with EPBC Act and Draft Part 3A Guidelines for Threatened Species Assessment (DEC & DPI July 2005); c. Developing work practices to reduce damage to vegetation and fauna during construction (such as limiting disturbance, fencing, worker education); d. Developing work practices to minimise impacts on mangroves and/or saltmarsh or compensatory measures arranged in accordance with DPI policy; e. Restoring vegetation of temporarily disturbed areas post-construction, with the aim to restore to at least pre-existing condition; f. Developing strategies to rehabilitate areas following completion of	During design (before construction commences).

Desired Action	Action	Timing
	g. If works are undertaken in native vegetation communities, restoration will use plant species from that community; and h. Develop strategies to monitor and manage potential locations of <i>Pterostylis</i> sp. (Botany Bay Bearded Orchid) at Kumell.	
Dust		
Dust generation during construction minimised.	14 Construction will be undertaken in a manner that minimises dust emissions from construction sites or compounds. Controls for dust will be incorporated into the Erosion and Sedimentation Control Plan outlined in SOC 15.	During construction.
Erosion Control / Sedimentation		
Control soil erosion and sedimentation during construction and operation to protect nearby waterways	15 A Construction Erosion and Sedimentation Control Plan will be prepared for the work sites for implementation during construction including: a. Measures to manage surface water and stormwater from disturbed areas in accordance with Managing Urban Stormwater: Soils and Construction (Landcom, 2004) including: 1. Avoiding sediment runoff into sensitive waterways (including Botany Bay, Towra Point wetland, Quibray Bay and Cooks River); 2. Minimising the area of bare surfaces during construction; and 3. Preventing the spread of soil by construction vehicles on public roads. b. Measures to limit dust emissions from work sites where feasible including: 1. Managing stockpiles to suppress dust emissions; and 2. Measures to wash vehicles and cover loads where there is the potential to generate dust, as practicable. c. Identifying the need for a licence under the POEO Act for any activities associated with stormwater discharge; and d. Measures to manage spoil, silt and fluid during trenchless construction.	
Hydrology and Flooding		
Stormwater and flood risk managed on all construction sites.	16 Stormwater management measures on all construction sites will be designed in accordance with relevant guidelines. Relevant local authorities will be consulted regarding flood risk and mitigation measures.	During design (before construction commences).
Release of water used for commissioning managed to minimise the impact on waterways.	17 Work practices will be developed to manage the release of potable water for implementation during commissioning of the delivery system, generally in accordance with Sydney Waters' <i>Water Discharge Protocols</i> to reduce water quality impacts and hydrological impacts on receiving waters.	During design (prior to commissioning).
Visual		
Construction work sites rehabilitated.	25 A program will be developed to minimise construction time and to progressively rehabilitate areas disturbed temporarily by construction as far as practicable to pre-work condition to mitigate visual impact.	During design (before construction commences).

Heritage

Desired Action	Action	Timing
Indigenous and non-indigenous cultural heritage values protected along infrastructure routes and at	21 Infrastructure routes and temporary construction sites will be located and management practices will be developed to minimise impacts, where practicable, on indigenous and non-indigenous cultural heritage values for implementation during construction, including: a. Reviewing remote magnetic survey work for the presence of any shipwreck debris in the path of the works in Botany Bay;	During design (before construction commences).
Heritage		

Desired Action	Action	Timing
Temporary construction sites.	b. An arborist will be consulted prior to construction to limit the potential impacts where works are carried out in Heritage Conservation Areas adjacent to trees of streetscape value or heritage significance; c. Former land surfaces and associated soil profiles situated below fill layers within PAD areas must be subject to some degree of archaeological monitoring. The scope, degree and frequency of archaeological monitoring will be the subject of future refinement, following the determination of the construction equipment and techniques to be used, and following initial experience of ground conditions. d. Developing work practices to reduce risk of damage to indigenous and non-indigenous heritage items or archaeology (such as limiting disturbance, fencing, and worker induction); and e. If the route is refined during detailed design further consultation with Municipal Councils will be undertaken once final option is chosen to identify local heritage items and heritage features.	During construction.
Indigenous cultural heritage values protected along infrastructure routes and at temporary construction sites.	22 If previously unidentified Aboriginal objects are discovered during construction of delivery system, all work likely to affect the object(s) will cease immediately and the DEC and relevant Local Aboriginal Land Councils will be informed. An investigation will be undertaken by a suitably qualified archaeologist to identify measures to be implemented to reduce impact on the objects discovered, prior to recommencing works.	During construction.
Non-indigenous cultural heritage values protected along infrastructure routes and at temporary construction sites.	23 If unexpected historical relic(s) are discovered during construction, all work likely to affect the relic(s) will cease and the NSW Heritage Office notified. An investigation will be undertaken by a suitably qualified archaeologist to identify measures to be implemented to reduce impact on the relics discovered, prior to recommencing works.	During construction.
Heritage values of the Pressure/City Tunnels maintained.	24 Connection into the Pressure or City Tunnels will be designed to be consistent with heritage values of maintaining the existing use of the tunnels. The NSW Heritage Office will be informed of the works and discussions held as to possible mitigation measures for implementation during construction.	During design (before construction commences).

Spill Management

Desired Action	Action	Timing
Beneficial reuse of spoil from construction maximised. Contaminated soils, if encountered, managed in accordance with DEC guidelines. Minimise traffic impacts from spoil transportation during construction.	9 Prior to the commencement of any bulk excavation works a Spoil Management and Disposal Strategy will be developed and implemented consistent with condition 5.3 of the Concept Approval.	Prior to the commencement of any bulk excavation works
Contaminated Soils		
Contaminated soils and acid sulphate soil risks managed during construction in accordance with guidelines.	18 A Contaminated Soil and Acid Sulphate Soil Management Plan will be prepared to identify and manage contaminated soils for implementation during construction including: a. Field investigations to confirm presence of soil contamination and measures to avoid and mitigate impacts on sites;	During design (before construction commences).

Desired Action		Action		Timing
Groundwater		b. Methods to classify spoil for disposal in accordance with Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Waste (EPA, 1999); c. Procedures to properly assess and manage any previously unidentified areas of contaminated soils encountered; and d. Confirming presence of potential acid sulphate soils and developing management and disposal options for acid sulphate soils consistent with the Acid Sulphate Soil Manual (Acid Sulphate Soil Management Advisory Committee, 1998).		
Waste		19 Controls on dewatering activities (including measures such as reinjection) will be developed such that potential impacts on the local groundwater regime is maintained and the spatial extent of contaminated groundwater is not increased. Where geotechnical investigations indicate that containment and treatment is required prior to discharge, this will be identified in line with provisions in the POEO Act.		During design (before construction commences).
Waste		27 Measures to reduce, reuse and recycle construction wastes will be developed with consideration of the Resource NSW (2003) Waste Avoidance and Resource Recovery Strategy, for implementation during construction.		During design (before construction commences).
Waste		28 A Waste Management Plan will be prepared to ensure the proper classification and management of all construction waste material unable to be reused or recycled in accordance with relevant legislation and Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes (EPA, 1999), for implementation during construction. Disposal requirements will involve appropriate treatment on-site and/or, as applicable, the use of a licensed waste transporter and disposal at a facility licensed to accept the waste type.		During design (before construction commences).

