NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT
Kurnell Desalinated Water Delivery System

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

October 2007

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EXECUTIVE SUMMARY

The 2006 Metropolitan Water Plan outlines measures to be taken to enable Sydney to grow and to continue to meet its future water needs. The Plan outlines a multi-focus approach including demand management, wastewater recycling, increasing maintenance to repair leaks and new water supplies, including deep access of dams, groundwater extraction and desalination. Justification, therefore, for the desalination plant stems directly from its inclusion in the suite of water supply and management measures detailed in the Plan.

On 16 November 2006, the Minister for Planning gave concept plan approval to the Kurnell Desalination Plant, including the main plant, seawater intake and discharge infrastructure and the desalinated water delivery system. Project approval was also given to the main plant and seawater intake and discharge infrastructure components of the project. While the Minister was satisfied that the distribution pipeline could be constructed in principle, there was insufficient detail at the time to issue full project approval. Subsequently, the Minister required the Proponent, Sydney Water Corporation, to seek further project approval for the desalinated water delivery system.

The Proponent now seeks the Minister's approval for the construction and operation of the desalinated water delivery system to distribute water from the desalination plant at Kurnell and connecting to Sydney's potable water distribution network at Erskineville. The route was selected on the basis of being able to achieve a 25 month construction timeframe to meet the overall delivery for the desalination plant. The route was also selected on the basis of technical capabilities (such as geotechnical conditions, ability to connect to Sydney's potable water supply network etc.), cost and importantly, environmental and social reasons, such as minimising disruptions to the community and minimising water quality and other ecological impacts.

The desalinated water delivery system project may generally be described as follows:

- construction and operation of an 1800 millimetre diameter pipeline from the desalination plant site at Kurnell to Silver Beach, with a length of approximately two kilometres;
- construction and operation of two 1400 millimetre diameter pipelines across the seafloor of Botany Bay, from Silver Beach to Cook Park, Kyeemagh, with a length of approximately eight kilometres;
- construction and operation of an 1800 millimetre diameter pipeline from Cook Park, Kyeemagh to Shaft 11C on the City Tunnel at Erskineville, with a length of approximately 8.3 kilometres; and
- ancillary features, including air and scour valves, scour drain lines, isolation valves, pressure release valves, access chambers, cross connection pipework, booster pump stations, surge protection equipment and chlorine injection facilities.

The Department received 145 submissions in response to the public exhibition of the Environmental Assessment. The majority of these submissions expressed their objection to the project, with a number also raising objection to the notion of desalination more generally.

Following the exhibition period and review of the submissions, the Proponent refined the alignment of the pipeline and construction methods. These changes were outlined and assessed in a Preferred Project Report which was also reviewed by relevant authorities as part of the assessment process. The key changes include employing trenchless construction technologies within residential areas, altering the route and construction method at Kurnell to avoid potential impacts on Captain Cook Drive, altering the route in and around Tempe Recreational Reserve to reduce impacts to nearby residences and the potential for the project to affect recreational facilities within the Reserve, altering the route to avoid impacts to Burrows Road and Campbell Road in Alexandria. The report also identifies an option of tunnelling under the seagrasses, although no firm commitment is made.

The Department has undertaken a comprehensive assessment of the technical merits of the proposal, and based on this assessment, as detailed in this report, has recommended that the Minister grant project approval to the construction and operation of the project. Through its assessment, the Department has determined that the key assessment issues for the proposal relate to construction noise and vibration impacts, construction traffic and access impacts, ecological impacts, water quality impacts and impacts to coastal processes. Other issues are considered to have been satisfactorily addressed in the Proponent's Preferred Project Report and Statement of Commitments.

The conditions of approval recommended by the Department have been carefully drafted to ensure that a comprehensive environmental framework is established, with a particular focus on ensuring that impacts to the amenity of residents and ecological impacts are minimised. In particular, the conditions of approval recommended by the Department require the Proponent to tunnel underneath the seagrasses at Silver Beach to avoid direct impacts to them and to use trenchless construction methods in residential areas to limit disruption to the community. Stringent water quality limits are recommended to minimise impacts to marine biota. The recommended conditions also require the Proponent to undertake a number of monitoring programs during and post construction of the project, including monitoring water quality, noise and vibration, flora and fauna within Botany Bay and coastal processes.

The desalinated water delivery system project forms the final component of Sydney's desalination plant and will enable the distribution of desalinated water from the plant at Kurnell to Sydney's potable water supply system.

The Department considers that the project will enable the objectives of the 2006 Metropolitan Water Plan to be fulfilled, providing a significant step towards securing Sydney's water supply for the future.

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1. BACKGROUND

On 16 November 2006, the Minister for Planning gave concept plan approval to the Kurnell Desalination Plant. As part of that approval, the Minister required the Proponent (Sydney Water Corporation) to seek further planning approval for the desalinated water delivery system. The Proponent has now sought the Minister's approval for the construction and operation of the desalinated water delivery system to distribute water from the desalination plant at Kurnell, connecting to Sydney's water distribution infrastructure system at Erskineville.

1.1 Location

The proposed route of the water delivery system was refined following the public exhibition of the Environmental Assessment. The Proponent's preferred route is shown in Figure 2 and is generally described as an 1800mm land pipeline from the desalination plant to Silver Beach in Kurnell; two 1400mm pipelines across the bed of Botany Bay to Cook Park, Kyeemagh; and an 1800mm land pipeline from Kyeemagh to the proposed water distribution connection point known as Shaft 11C on the City Tunnel at Bridge Street, Erskineville.

1.2 Surrounding Land Use

From the desalination plant to Silver Beach, the pipeline generally traverses industrial and residential land, including the township of Kurnell. Caltex Kurnell Refinery is located to the east. The nearest sensitive land uses to the pipeline route include Kurnell Primary School and the Towra Point Aquatic Reserve. The pipeline also passes the Kurnell Sub Transmission Station and the Kurnell Community Centre.

Within Botany Bay, the pipeline passes approximately 250 metres to the west of an aquaculture farm located on the southern side of the Bay and 1.25 kilometres west of the North-South Runway on the northern side of the Bay.

From Kyeemagh to Erskineville, the pipeline is located within and around a mixture of special uses, including Sydney Airport, open space/ recreation, including the Kogarah Golf Course, Cooks Park and Tempe Reserve, industrial/ commercial uses and residential. The nearest sensitive land uses to the pipeline on the northern side include Kyeemagh Infants School and the residents around Tancred Avenue, Kyeemagh, around South Street, Tempe and in Erskineville, around Ashmore, Bridge and Harley Streets.

1.3 Project Need, Justification and Alternatives Considered

In order to distribute the desalinated water produced at the desalination plant at Kurnell, a desalinated water delivery system is required to be built. As discussed elsewhere in this report, concept plan approval has been given to the construction and operation of the Kurnell Desalination Plant. The need for this project is borne out of this approval.

Factors influencing the alignment of the desalinated water delivery system and its connection to Sydney's potable water supply infrastructure were identified in the Environmental Assessment. These included, a requirement to cater for staging of the overall desalination project, ability to deliver the project within 25 months, social and environmental reasons such as reducing disruption to the community and minimising water quality and other ecological impacts and ability to be connected to an area of Sydney's distribution system that has a similar demand to the output of the plant (determined to be Potts Hill distribution zone, see Figure 1). Suitable connections to this zone are located on the northern side of the Bay. An option for locating the infrastructure around Botany Bay via Sutherland to Ashfield was considered, but not pursued owing to the significant disruption to residences and businesses and potential for significant construction delays and increased costs.

The Proponent investigated further options for crossing Botany Bay, including:

- a tunnel under Botany Bay via Botany directly to the City or Pressure Tunnel;
- trenchless technology to cross Botany Bay at its narrowest point, between Kurnell and La Perouse; and
- land based pipeline to Silver Beach, seafloor pipeline across Botany Bay to Cook Park at Kyeemagh and a tunnel or land based pipeline to the City/ Pressure Tunnel.

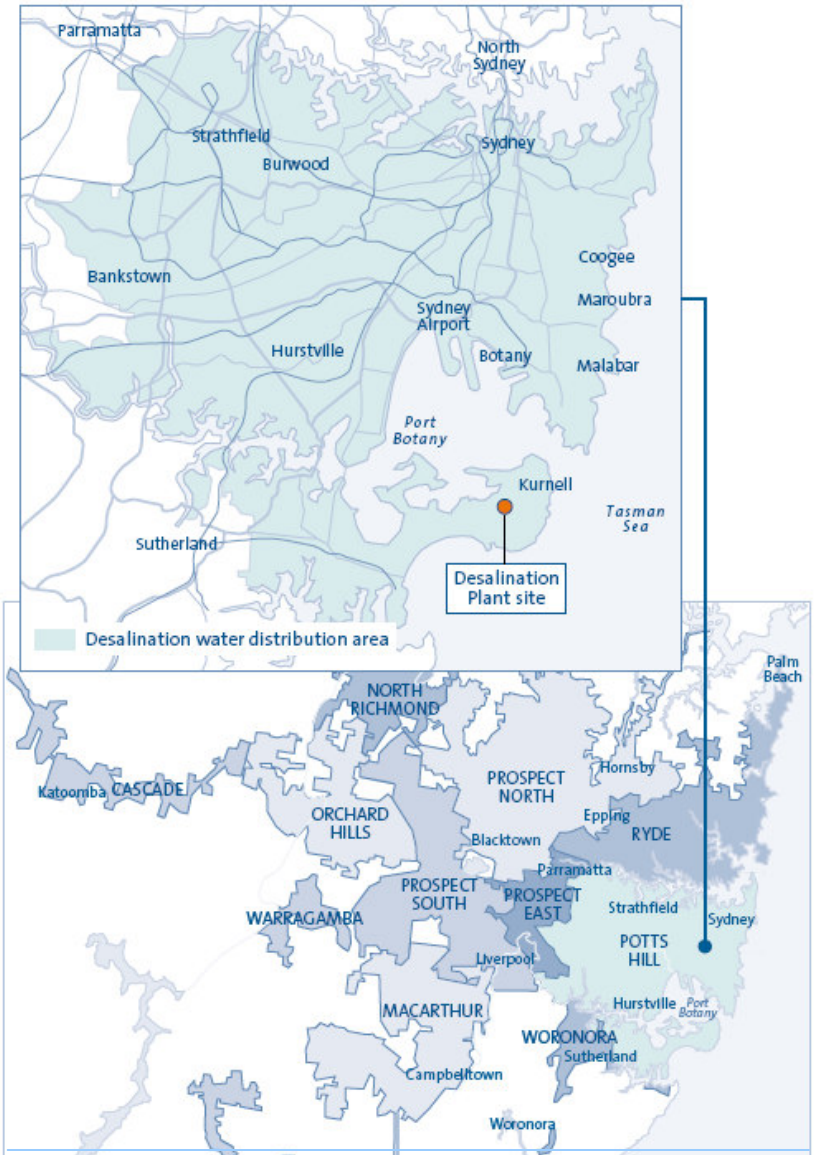


Figure 1 – Proposed Distribution Area

The first two options were discarded owing to their higher costs, risks associated with the geological conditions that may be encountered, including potential contamination, and the greater potential for not completing the project within the required 25 month period.

The Department is generally satisfied that the Proponent has adequately considered options for the alignment of the desalinated water delivery infrastructure and that the route of the pipeline, as proposed, is appropriate.

1.4 Related Planning Approvals

On 16 November 2006, the Minister for Planning gave concept plan approval to the Kurnell Desalination Plant. As part of that approval, the Minister also determined that no further environmental assessment was required for the desalination plant and the infrastructure for the seawater intake/ discharge system components of the project and granted project approval to these aspects. Construction has now commenced on these aspects of the project.

With respect to the desalinated water delivery infrastructure component of the project, however, the Minister considered that further project approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act) was required. The Proponent is now seeking project approval for that component of the project.

2. PROPOSED DEVELOPMENT

2.1 Project Description

The desalinated water delivery system project may generally be described as follows:

- construction and operation of an 1800 millimetre diameter pipeline from the desalination plant site at Kurnell to Silver Beach, with a length of approximately two kilometres;
- construction and operation of two 1400 millimetre diameter pipelines across the floor of Botany Bay, from Silver Beach to Cook Park, Kyeemagh, with a length of approximately eight kilometres;
- construction and operation of an 1800 millimetre diameter pipeline from Cook Park, Kyeemagh to Shaft 11C on the City Tunnel at Erskineville, with a length of approximately 8.3 kilometres; and
- ancillary features, including air and scour valves, scour drain lines, isolation valves, pressure release valves, access chambers, cross connection pipework, booster pump stations, surge protection equipment and chlorine injection facilities.

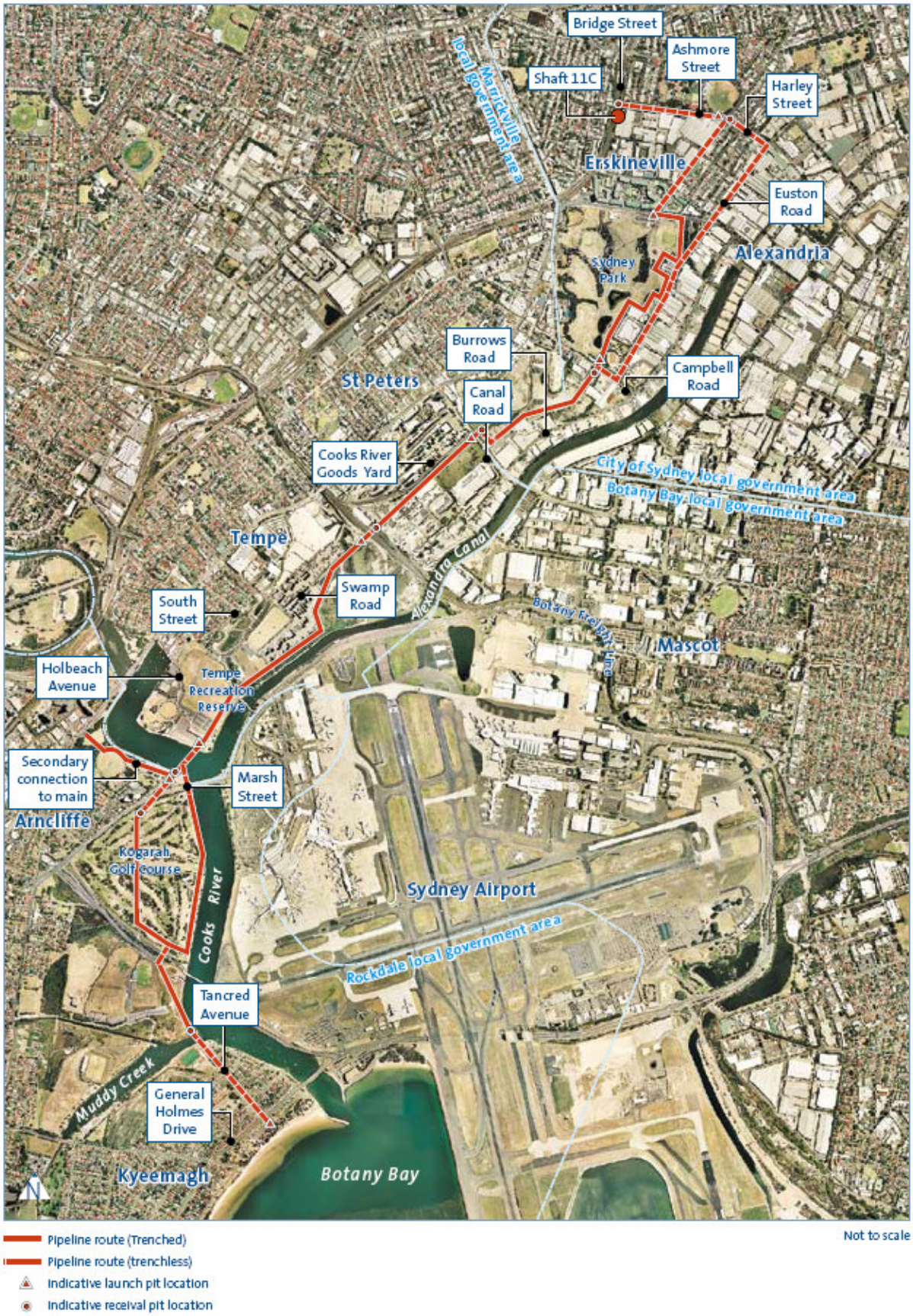
As noted in section 1.1, following the public exhibition of the Environmental Assessment, the Proponent refined the route of the pipeline and provided further detail on the proposed construction methods to be used along the route. The route and construction methods are shown in Figure 2. The proposed locations of the launch and receival pits are also shown in the figure.

Figure 2 – Proposed Pipeline Route and Surrounding Land Uses

a. Desalination Plant to Silver Beach, Kurnell

b. Crossing of Botany Bay from Silver Beach to Kyeemagh

c. Kyeemagh to Shaft 11C at Erskineville



Construction of the pipeline is anticipated to take a total of 25 months and will involve some 24 hour construction activities, however, works in any one area will generally be less that this. For example, construction work at Silver Beach will take between ten and 18 months, while works across the Bay are expected to take in the order of ten months where trenchless construction is employed under the seagrasses, otherwise, 16-18 months. The Cook Park compound at Kyeemagh is expected to be in place the full 25 months.

The construction methods, as refined in the Preferred Project Report are described below:

Trenching Construction Method
Trenching construction methods on land will involve the following (see Figure 3):

- site establishment;
- relocation of existing services;
- water table management, including installation of spear-point dewatering pipes placed in parallel rows on each side of the trench. Reinjection of groundwater will occur progressively;
- installation of trench support;
- excavation of the trench. The trench will be approximately 4.5 – 5m deep to allow at least 1.1m ground cover over the pipe and at least 150mm of bedding beneath the pipe. The working area will be 8.3m wide when working in constrained areas and 15m wide when working in areas less constrained, such as open space;
- installation of the pipe;
- backfilling the trench and removal of trench support and dewatering equipment;
- installation of section valve pits, scour valves and air release valves; and
- reinstatement of the ground surface.

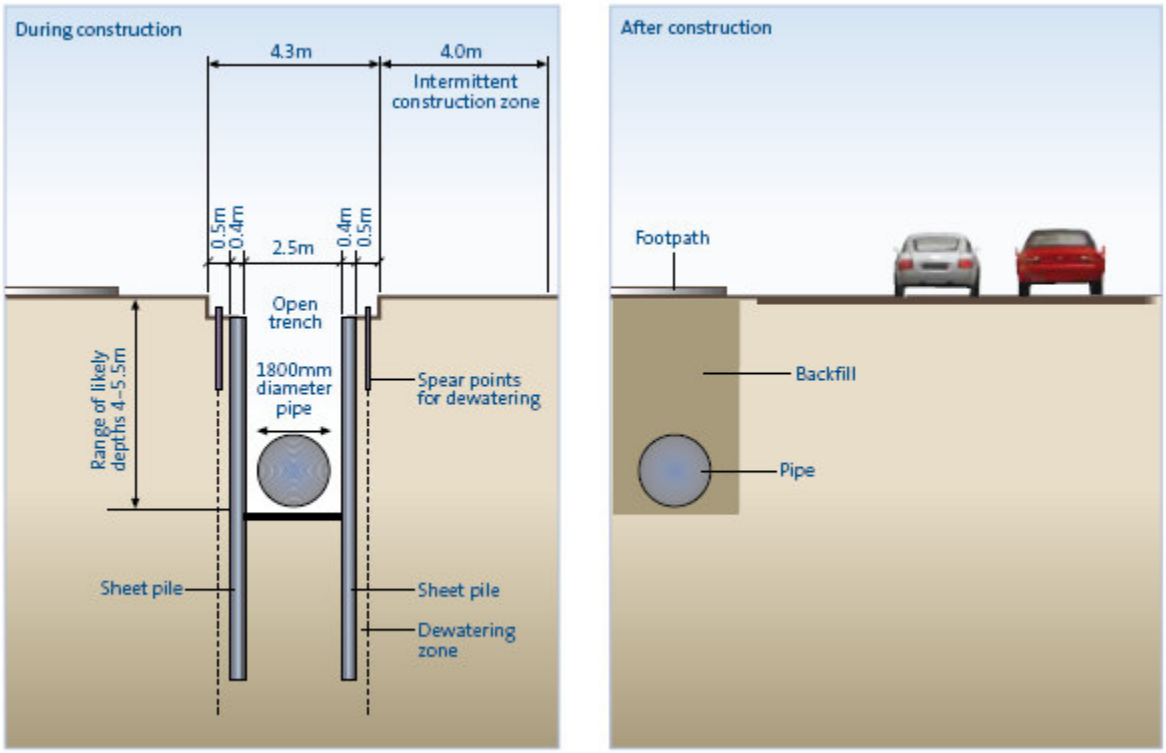


Figure 3 – Typical cross section of trenching construction on land (in a constrained area)

Trenching construction methods within Botany Bay will involve the following:
Silver Beach

- establishment of compound at Silver Beach of around 1.2ha, with a reclaimed area extending between adjacent groynes out to 75m;
- construction of a temporary jetty extending 300m offshore to enable land-based equipment to undertake excavation and backfill activities. The jetty will be installed by crane with 600mm tubular steel piles driven hydraulically into the seabed;
- installation of sheet piles 9m apart to a point approximately 600m offshore;

- installation of sheet piles around the active excavation zone;
- storing of excavated material from first 300 m within the beach compound at Silver Beach with the remaining material stored along the north-south batter of the existing dredged basin adjacent to the runway;
- installation of pipelines and subsequent backfilling and removal of sheet piles and temporary jetty.

Within Botany Bay

- trenching of the sea floor using two cutter suction dredges. A cutter suction dredge has a cutter head at the suction inlet to loosen the sediment and transport it to the suction mouth. Dredged sediment is then sucked through a pipeline and distributed to the discharge dredges for direct disposal (that is, to backfill or temporarily store spoil within the Bay) as shown in Figure 4. The trench will be approximately 10 metres wide at the base and have batter slopes of 1(vertical):4(horizontal), leading to a trench footprint of approximately 42 metres wide (see Figure 5);
- pipe sections (generally around 12m in length) will be transported by barge out to a lay barge where the sections will be welded directly to the pipe being laid;
- two dredge discharge barges will then backfill the trench; and
- vessels will be operated 24 hours a day with around 96m of pipe laid each day.

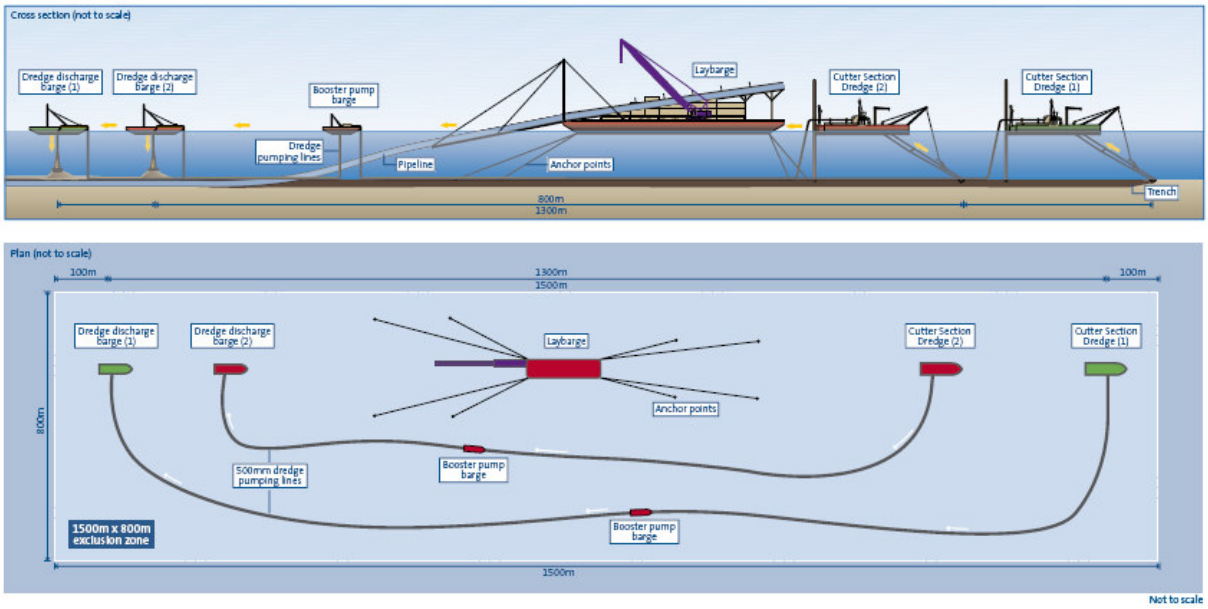


Figure 4 – Indicative construction method for trenching across Botany Bay showing the cutter suction dredges and discharge barges

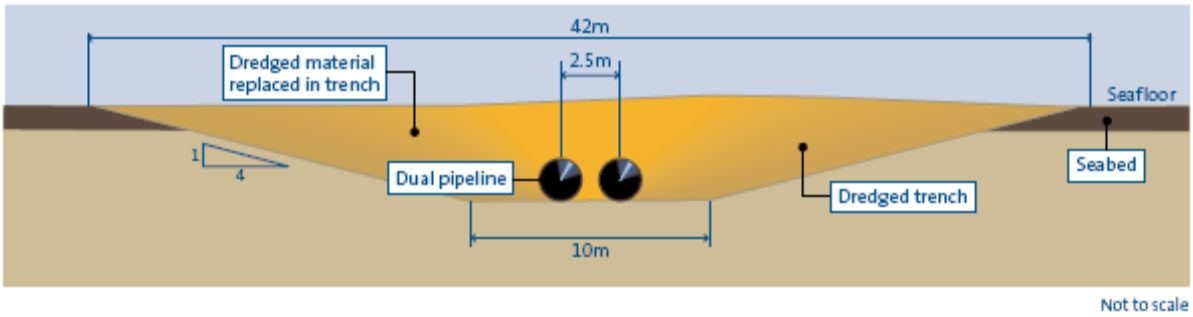


Figure 5 – Indicative cross-section of trench in Botany Bay (outside of seagrasses)

Kyeemagh

- temporary sheet piles will be installed along the beach zone to a point 190m offshore of the low water mark to reduce the width of the trench to 9 m;
- construction of a temporary work platform adjacent to the sheet piles comprising a solid quay 200m in length and 14m wide and a jetty extending a further 200m as per the methods at Silver Beach;

- installation of pipelines and connection to land-based pipeline, backfilling and removal of sheet piles and temporary jetty.

Trenchless Construction Method

Trenchless construction on land involves the following key components (see Figure 6):

- construction of launch and receival pits;
- use of remotely controlled cutting head to excavate spoil and create space for pipeline installation;
- installation of the support pipe which lines the excavated tunnel behind the cutting head using pipe jacking;
- installation of the carrier pipe inside the support pipe; and
- removal of the launch and receival pits and reinstatement of the ground surface.

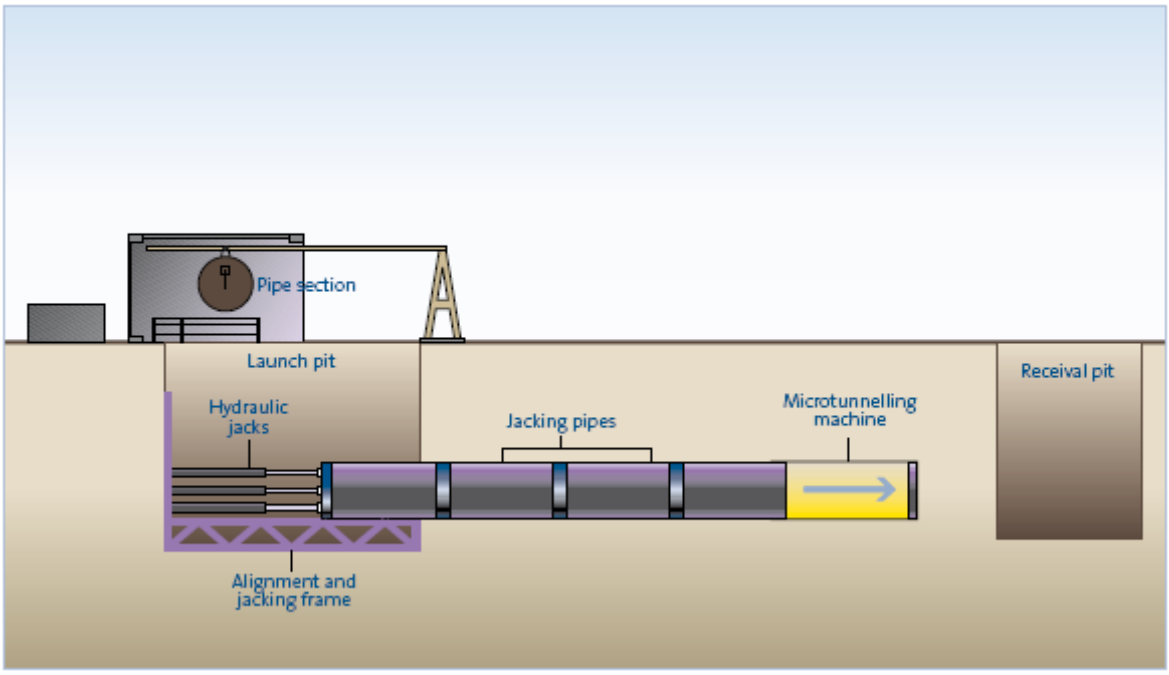


Figure 6 – Indicative cross-section of trenchless technology on land

The combined launch and receival pits may operate for approximately ten months whilst separate launch and receival pits may operate for around six months based on 24 hour construction. Pits will generally be in existence for between six and 12 months depending on schedule requirements, the continuity of work and the drive length. The launch pits will be approximately 8.5m x 4.5m and be located within a compound 40m x 25m whilst the receival pits will be approximately 6.5m x 3.5m within a compound approximately 25m x 15m. The launch and receival pits are proposed in the following locations, as shown in Figure 2:

- AGL land adjacent to Captain Cook Drive, Kurnell (launch pit) to Dampier Street, Kurnell (receival pit) on vacant land south of intersection with Tasman Street;
- Silver Beach, Kurnell – launch pit, with option for second launch pit if trenching under the seagrasses;
- Tancred Avenue, Kyeemagh (launch pit) within construction compound at Cook Park to Muddy Creek (west side) (receival pit) on vacant land;
- Kogarah Golf Course (launch pit) under Cooks River to Tempe Recreational Reserve (receival pit);
- Under the Botany Goods Railway line (launch and receival pit either side);
- Under Canal Road (launch and receival pit either side);
- Mitchell Road, Erskineville (launch pit) within car park at Sydney Park adjacent to Sydney Park Road;
- Intersection Mitchell Road & Ashmore Street – combined launch and receival pit, one lane of Ashmore Street to be closed (pit dimensions 10m X 6m and compound area of 30m X 25m); and
- Intersection Bridge Street & Ashmore Street (receival pit).

Trenchless construction under the seagrasses off Silver Beach, Kurnell will involve the following:

- establishment of a dual launch pit at the Silver Beach construction compound around 13m by 10m (total construction compound of 0.5 ha);

- launch of two tunnelling machines (one for each pipeline across the Bay). The pipeline would pass approximately 6m under the seagrass beds to a point approximately 800 metres into Botany Bay, around 200 metres beyond the dense seagrass patches;
- sealing of the tunnel machine at around 800m, clearing and flooding of the pipelines to create even pressure;
- removal of the tunnelling machines by firstly using a cutter suction dredger to excavate to within around 1m of the machines, then deployment of a separate vessel with a suction tool to excavate the remaining material around the machines and use of a barge-mounted crane to retrieve the tunnel machines. An area of around 60m in diameter would be disturbed; and
- total construction duration for works being staged from Silver Beach of around 10 months, 6 to 8 months less than that estimated using trenching construction methods. This includes tunnelling 24 hours a day to achieve the 800m drive and 24 hour construction for around 3 weeks to remove the tunnelling machines.

2.2 Amendments to the Proposal

Minor changes were made to the proposal following the public exhibition of the Environmental Assessment. The changes generally involve refinement of the route and alterations to the construction method at certain locations, with key changes summarised as follows:

Table 1 – Key Amendments to the Proposal

Proposed in EA	Changes in PPR	Environmental/ Social Change
Route selection		
- see Figures 2.1 to 2.3 in PPR for route proposed in EA	- see Figures 2.1 to 2.3 in PPR for route proposed	In general, proposed changes aim to result in reduced or no greater impact/ or loss to: - seagrasses and terrestrial vegetation; - heritage; - noise or traffic, particularly in residential areas; - disruption to services; over that proposed in the EA. Where feasible, construction times have also been reduced.
Construction method in Residential Streets		
- trenching to be used in some residential streets	- trenchless construction in all residential streets (except Bridge Street)	Trenchless construction in residential streets will result in less disruption to the road network and will minimise disturbance to residences and businesses on those roads Trenchless construction will avoid direct noise impacts to residents, however, there is likely to be some noise and vibration impacts near the launch and receival pits. A management plan detailing mitigation measures and best practice methods will be implemented.
Launch and Receival Pits		
- did not define combining launch and receival pits - 12 weeks to install 300m of pipe (with 24h construction)	- a number of receival pits to be converted to launch pits - 6 months to install 360m of pipe (with 24h construction)	Combining launch and receival pits, reduces the number of excavations required. Whilst noise impacts along the length of the pipeline route will generally be reduced, there will be a concentration of noise over a longer period at the pit locations. A management plan detailing mitigation measures and best practice

Proposed in EA	Changes in PPR	Environmental/ Social Change
		methods will be implemented.
Seagrasses		
- Proposed trenching through seagrasses for around 600m	- Preferred option for trenchless construction under seagrasses for a length of around 800m	Tunnelling 6m under the sea floor for 800m off Silver Beach to avoid disturbance to sensitive seagrasses
Storage of dredged material		
- no storage of material in Botany Bay	- temporary storage in existing dredged basin west of airport runway with permanent storage of around 35,000m^3 in the basin	- temporary storage within the bay will reduce traffic impacts (dredged material will not have to be stored on land). Storage of the spoil is not expected to significantly affect coastal processes, aquatic ecology impacts are expected to be minor, noise impacts are manageable
Botany Bay Crossing		
- Pipe would be installed in 500m sections with a footprint approximately 48m wide	Pipe sections (around 12m in length) would be welded from a lay barge progressively across the bay. Footprint reduced to 42m. Operation 24h	- reduced disturbance of sediments, thereby less impact on aquatic ecology - not expected to significantly affect coastal processes - noise impacts are manageable.

3. STATUTORY CONTEXT

3.1 Major Project

On 25 October 2005, the Minister for Planning formed the opinion pursuant to clause 6 of *State Environmental Planning Policy (Major Projects) 2005* (Major Projects SEPP) that the proposal is for the purpose of development described in Schedule 1 to that Policy (clause 25(2) – development for the purpose of a desalination plant for drinking water supply with capital investment in excess of $10 million). The proposal is thus declared to be a project to which Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act) applies.

3.2 Critical Infrastructure Project

On 16 November 2005, the Minister for Planning formed the opinion pursuant to clause 6A of the Major Projects SEPP 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.

3.3 Director-General's Requirements and Adequacy of Environmental Assessment

The Director-General's requirements for the preparation of an Environmental Assessment for the desalinated water delivery system were issued as part of the concept plan approval for the Kurnell Desalination Project on 16 November 2006. For the purpose of section 75I(2)(g) of the Act, the Environmental Assessment for the project complied with the Director-General's requirements and the Proponent was notified of its compliance on 17 April 2007.

3.4 Environmental Planning Instruments

There are no State Environmental Planning Policies that apply to the proposal that substantially govern the carrying out of the project. It is highlighted that *State Environmental Planning Policy (Major Projects) 2005* and *State Environmental Planning Policy (Metropolitan Water Supply) 2004*, although applicable, do not include provisions specific to the assessment of the proposal, nor do they contain development standards or matters for consideration when determining a project.

3.5 Exhibition and Notification

The Environmental Assessment was placed on public exhibition from Thursday 26 April 2007 until Monday 28 May 2007 and submissions invited in accordance with section 75H of the Act. Exhibition locations were as follows:

- Department of Planning's head office in Sydney;
- Sydney Water Corporation's head office in Sydney;
- Sutherland Shire Council;
- Marrickville Council;
- Rockdale City Council
- Council of the City of Sydney; and
- Nature Conservation Council.

The Environmental Assessment was also provided for download on the Department's internet site. Notification of the exhibition period was made through two separate advertisements in The Sydney Morning Herald and The Daily Telegraph on 25 April 2007 and again on 16 May 2007.

4. CONSULTATION AND ISSUES RAISED

The Environmental Assessment was publicly exhibited from Thursday 26 April 2007 until Monday 28 May 2007. During the exhibition period a total of 145 submissions were received. Submissions were received from State and local government agencies, various private organisations and special interest groups, and the local community. Of the total submissions received, close to 72% objected to the proposal (57% of which objected to the proposal itself and a further 15% to desalination more generally), only 2% clearly stated support for the project and desalination generally, and the remaining 26% did not explicitly state a position on the project, but raised concerns or made comments on the proposal. The submissions ranged from various versions of form letters to more substantial individual letters.

Approximately one third of submissions were received from residents of Kurnell (those potentially directly affected by aspects of the project). Approximately 29% of submissions did not provide an address, however, it was evident that a considerable number of these submissions were from University students, objecting to the proposal. The balance of submissions were largely received from people residing in other parts of Sydney, although a small number of submissions were also received from rural and regional NSW (less than 1%).

4.1 Submissions from State and Local Government

Submissions were received from four State government agencies and five local Councils:

- Department of Primary Industries – **key area of concern** relates to the impacts of the project on the seagrass beds off Silver Beach. The Department of Primary Industries does not support trenching through the seagrasses and would prefer the pipelines to be tunnelled underneath the seagrasses. The Department also recommended that monitoring of the wave climate and sediment transport be carried out during construction to confirm the predictions in the Environmental Assessment. The Department of Primary Industries also request further information regarding spoil disposal and options for sediment management once construction techniques have been finalised.
- Department of Environment and Climate Change – **raises a series of concerns** over impacts on marine ecology, water quality impacts, construction noise and vibration.
- Roads and Traffic Authority – **raises a series of concerns** over the potential for the pipeline to interfere with proposed future roads in the area. The RTA suggests a number of conditions to minimise this impact, including the pipeline being designed and constructed so that it is maintenance free within RTA classified roads and existing and future road corridors. The RTA also suggests that the Proponent consult with the RTA with respect to the project alignment and construction methods in RTA roads.
- Department of Health – identifies the project has the potential to impact on population health and supports the approach suggested by the Proponent to minimise impacts. NSW Health also recommends a number of management plans be prepared including for spoil management and disposal, traffic, construction noise and erosion and sedimentation, with measure undertaken to manage any contaminated soil and groundwater that is encountered.
- Rockdale City Council – notes generally that there are better alternatives to desalination. With respect to the proposed pipeline route in particular, Council **raises a series of concerns** over impacts on water quality in the Cooks River and Botany Bay, especially with regard to the presence of contaminated soil and exposure of acid sulfate soils, groundwater management, particularly dewatering, aquatic ecology, especially on seagrasses and benthic organisms and the spread of *Caulerpa taxifolia*, coastal processes, particularly impacts on Lady Robinsons Beach, terrestrial ecology, noting the substantial restoration works already undertaken and the potential for damage to these areas, management of spoil and construction noise. Council also requests the Proponent keep the community informed of the progress of the project, including timing of construction etc. Council also notes that the Proponent will need to obtain approval from Council for any works undertaken within local road reserves and should ensure effective consultation with Council in relation to works within its local government area.
- Sutherland Shire Council – **raises significant concern** with the project and considers the Environmental Assessment provides insufficient detail on which to base an accurate and informed decision on the scale and nature of the impacts of the proposal. The Council raises particular concern with the lack of information regarding contaminated land, potential exposure of acid sulfate soils, loss of public space, the cycleway on Captain Cook Drive and access to property, noise impacts, indigenous heritage, water quality and aquatic ecology, particularly seagrasses.

- Council of the City of Sydney – **supports** the alignment of the pipeline noting that it largely avoids residential areas and will be located within the road reserve. Council also supports trenchless construction for the majority of the route to minimise adverse amenity impacts. Council requests the Proponent investigate the possibility of co-locating non-potable water pipelines within the route alignment. Specific concerns relate to residential amenity, vehicular and pedestrian traffic and access and protection of street trees. Council also recommends a number of conditions should the Minister approve the project, including management of any contaminated spoil, various management plans for noise, water and traffic, community consultation and other road conditions.
- Randwick City Council - **does not support** desalination. Council is concerned about impacts to the marine ecology of Botany Bay, particularly noting cumulative impacts arising from other development in the area such as the Port Botany Expansion. The Proponent should consult with the public regarding the seagrass management plan/ aquatic weed management. Council considers alternatives to desalination should be explored.
- Marrickville Council – **objects** to the proposal. Council expressed particular concern at the lack of detail provided in the Environmental Assessment regarding the alignment of the pipeline, construction method or timeframe for construction. It considers there will be adverse impacts associated with construction including dust, noise and water pollution as well as impacts to Cooks River, existing contaminated lands and potential acid sulfate soils, flood liable lands, as well as loss of open space, habitat and fauna and the undermining of established Council and community environment programs. Council suggests a number of alternative routes to reduce the impact of the project on people in its community. Council requests the Proponent investigate the possibility of co-locating non-potable water pipelines within the route alignment. A number of conditions are recommended to minimise identified impacts.

4.2 Summary of Issues Raised

A breakdown of the issues raised in the submissions is presented in Figure 7. The frequency of each issue raised in submissions has been calculated based on its occurrence relative to the total number of issues raised, rather than the fraction of total submissions that raise a particular issue.

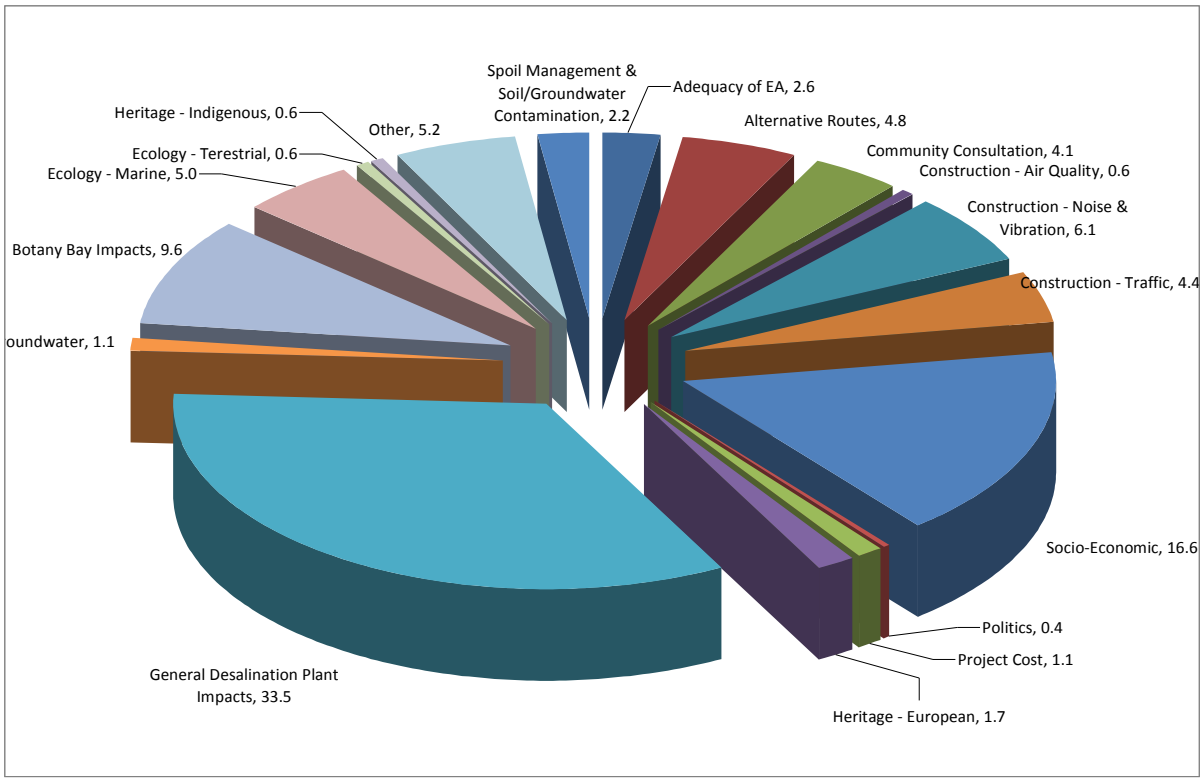


Figure 7 - Breakdown of Issues Raised in Submissions

Fifty three percent of issues raised in submissions relate to the direct impacts of the proposal on its immediate surrounding environment (socio-economic, ecology, water quality, traffic, noise, heritage, land use planning, spoil management and groundwater). Of these issues, socio-economic impacts such as access to property, construction disruptions and loss of amenities constitute the most frequently raised issue of concern, at 16.6% of all issues raised in submissions. Impacts to Botany Bay, including marine ecology, water quality, exposure of contaminated sediment and general health of the Bay was also a source of significant concern with a further 16.2% of all issues raised in submissions indicating concern with these aspects. Construction noise (6.1%) and traffic impacts (4.4%) were also key issues of concern raised in submissions. All other direct impacts are raised relatively infrequently in submissions.

Interestingly, 33.5% of all issues raised in submissions related specifically to impacts of the desalination plant and the seawater intake/ discharge infrastructure, including its justification and alternatives to implementation (12.8% of issues raised), marine ecology impacts (6.8% of issues) and energy and greenhouse gases (3.5%). Those submittors raising such issues generally focussed upon these aspects of the project rather than also raising specific concern with the water delivery system project itself (the subject of this project application). While the Department appreciates the concerns of the community with respect to the justification for a desalination plant for Sydney, it is not a relevant consideration for this project and will not be considered further as part of this assessment report.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The Department's assessment has focused on matters identified by the Department, public submissions, and agency submissions as key issues associated with the proposal, that being: noise and vibration impacts, traffic and access impacts, flora and fauna impacts, particularly marine, water quality impacts and impacts on coastal processes. Other issues are considered to be satisfactorily addressed by the Proponent's Preferred Project Report and Statement of Commitments.

5.1 Noise and Vibration Impacts

Issue

Construction of the pipeline is anticipated to take approximately 25 months. The Proponent states that construction works will generally be restricted to standard construction hours, that is, between 7am and 6pm Monday to Friday, between 8am and 1pm on Saturdays (where audible at residential premises, otherwise 7am and 1pm) and at no time on Sundays or public holidays. The Proponent notes that construction may need to occur on a 24 hour basis for some activities, such as when undertaking trenchless technology and crossing Botany Bay.

Construction of the pipeline is proposed to be undertaken using a combination of trenching and trenchless technology. Depending on ground conditions, trenching activities will progress at a rate of approximately 6 lineal metres per day. If trenchless construction is to occur on a 24 hour basis, drive lengths between launch and receival pits of approximately 1,000m can be achieved. The noise assessment included in the Environmental Assessment provided an assessment of the impact of the project based on information provided by Sydney Water in relation to where each technology was likely to be carried out.

In response to community concerns, the Minister for Water and Utilities announced that construction of the pipeline within residential areas would be carried out using trenchless technology to further minimise impacts associated with the project to residents, including reducing noise levels and disruptions to traffic and access to properties. The Proponent's Preferred Project Report reaffirmed this commitment. In particular, the Proponent has committed to using trenchless construction technology along the following streets: Dampier Street, Kurnell, Tancred Avenue, Kyeemagh, Campbell Road, Euston Road and Harley Street, Alexandria and Mitchell Road and Ashmore Street, Erskineville. The Proponent states it is not feasible to use trenchless technology along Bridge Street to Shaft 11C owing to the short distance along which the pipeline will traverse this road.

A number of other minor refinements to the route have been put forward in the Preferred Project Report in response to the submissions and other technical information. In light of this, the Proponent prepared a revised noise assessment.

The key results of the noise assessment are summarised in the following table:

Table 2 – Predicted Construction Noise Levels ($L_{A10(15\ minute)}$)

Sector	Construction Location	Activities at Location	Distance of Nearest Resident	Noise Received at Residence (without mitigation) (dB(A))	Criteria[a] (dB(A))	Exceedance at Residence (with mitigation) (dB(A))
Kurnell Sector	Dampier St/ Tasman St receival pit	Pit excavation, Retrieve boring equipment	at 15m at 30m	58-76 52-70 (with mitigation)	Day – 51 Night - 39	7-25
	Silver Beach launch pit	Pit excavation, Tunnel boring, Move/ remove equipment, Install pipeline	40m	65-83	Day – 51 Night – 39	0-14

Sector	Construction Location	Activities at Location	Distance of Nearest Resident	Noise Received at Residence (without mitigation) (dB(A))	Criteria[a] (dB(A))	Exceedance at Residence (with mitigation) (dB(A))
	Silver Beach compound (with trenching across seagrasses)	Compound establishment, Sheet piling, Trenching, Bed preparation, Pipe laying	40m (from compound), otherwise 50m	61-87	Day - 51	0-18
Botany Bay Sector	Silver Beach/ Kurnell	Dredge and lay barge operations	200m	53	Day – 51 Night – 39	0 6
	Kyeemagh	Dredge and lay barge operations	800m	65	Day – 56 Night – 42	1 15
Urban Sydney Sector	Kyeemagh compound	Compound establishment, Quay/ sheet piling, Trenching, Bed preparation, Pipe laying	30m (from compound), otherwise 100m	59-78	Day - 56	0-4
	Kyeemagh launch pit	Pit excavation, Tunnel boring, Move/ remove equipment, Install pipeline	40m	65-83	Day – 42 Night – 56	0-9
	Kogarah Golf Course	Sheet piling, Other activities	60m	69-76	Day - 58	0-3
	Sydney Park launch pit	Pit excavation, Tunnel boring, Install pipeline	40m	66-83	Day – 68 Night – 50	0
	Ashmore St/ Mitchell Rd launch and receival pit	Pit excavation, Retrieval boring machine, Tunnel boring, Install pipeline	35m	65-80	Day – 53 Night – 45	0-9
	Ashmore St/ Bridge St receival pit	Pit excavation, Sheet piling, Retrieval boring machine	6m	81-97	Day – 53	10-26
	Sydney Park trenching	Sheet piling, other activities	70m	62-74	Day – 53	0-6

a. Day criteria based on background plus 10 dB(A), Night criteria based on background plus 5dB(A)

The above table shows that without mitigation, noise goals are unlikely to be achieved for the majority of residences under most conditions. The Proponent identifies a number of mitigation measures that could be used during construction of the project in order to reduce noise levels at nearby sensitive receivers. Such measures include use of best available technology economically achievable, enclosures, staff awareness training, timing of construction activities, screening and use of silencers. These identified mitigation measures are noted to reduce received noise by between 6dB(A) and 37dB(A).

With the noise mitigation measures proposed by the Proponent in place, the above table demonstrates that noise goals can generally be achieved during the day, with the exception of pit excavation activities. Pit excavation activities and other noise activities are only proposed to be carried out during the day to limit their impact and in general, will take around 6 weeks, with sheet piling (where necessary), taking around 2 weeks. The noise assessment also shows that there may be some exceedance of the night time noise goals when undertaking microtunnelling of up to 11dB(A) for residences near Silver Beach, 8dB(A) for residences near the launch pit at Kyeemagh and up to 3dB(A) for residences located in Alexandria.

As noted, the Proponent proposes to lay the pipeline within Botany Bay 24 hours a day. The noise assessment shows that construction of the pipeline across the majority of Botany Bay will meet the noise goals, however, when in close proximity to the foreshore areas, there may be some exceedances of the night time noise goals. To address this issue, the Proponent states that when working within 500m of Lady Robinsons Beach, construction may be scaled back to 12 hours a day (that is, construction will not occur at night).

The Proponent also prepared a revised vibration impact assessment due to proposed changes to construction methods since exhibition of the Environmental Assessment. The results indicate that microtunnelling works will generally be able to comply with the vibration criteria, however, there could be some exceedances of the criteria by up to 20mm/s during establishment of launch and receival pits (which are expected to take around 3 weeks to establish). The Proponent states that impacts from regenerated noise (which occurs when ground borne vibrations are transmitted to a building structure and subsequently radiate noise within the building) may be expected at residences along Dampier Street, Tancred Avenue, Ashmore Street and Mitchell Road, although such impacts are not expected to exceed three days.

The Proponent notes that construction of the project will need to be carefully managed to ensure that noise and vibration impacts are minimised using feasible and reasonable mitigation measures. To this end, the Proponent has committed to preparing and implementing a Construction Noise Management Plan to detail noise mitigation measures and a noise monitoring program to determine compliance. The Proponent has also committed to communicating with the local Councils and communities directly affected by the proposal, including providing details on the construction program and providing opportunities for the community to provide input into mitigation measures and a complaints handling procedure where residents can make complaints about the project.

Submissions

6.1% of all issues raised in submissions relate to noise and vibration impacts arising as a result of construction of the project. Specific concern was raised in relation to construction noise from activities at Sydney Park, across Botany Bay, the Kyeemagh and Silver Beach construction compounds, construction in residential areas and the resultant impacts on sensitive noise receptors such as schools and residences.

The Department of Environment and Climate Change (DECC) expresses a number of concerns with the construction of the project, particularly that the construction of the pipeline will result in significant construction noise, including outside usual construction hours. The DECC also notes that whilst trenchless construction within residential areas will reduce the number of residents exposed to the daytime construction noise, a smaller section of the community will now be exposed to day and night time construction from the launch and receival pits due to the need to tunnel 24 hours per day.

The DECC did not consider Sydney Water had gone far enough in refining noise mitigation methods in line with the proposed changes to the construction method from that originally outlined in the Environmental Assessment. It suggests that consideration be given to constructing buildings over micro-tunnelling access sites and beach compound areas, time restrictions and respite from piling operations, temporary relocation of affected residents, which should be detailed in a Construction Noise Management Plan.

The DECC also considers that the need for undertaking construction 24 hours a day should be carefully considered, with alternatives evaluated and weighed against the potentially adverse impacts that will be experienced by residents. This is especially true for the laying of the pipeline within Botany Bay. That is, the DECC notes that the revised construction method across the Bay will take less time than that originally proposed in the Environmental Assessment. Therefore, the need to carry out 24 hour construction across the Bay to meet the delivery timeframe of 25 months is not considered to be as critical.

Consideration

The Department acknowledges that construction of the project has the potential to impact upon the acoustic amenity of the area, particularly during certain construction activities such as sheet piling and the establishment of the launch and receival pits, where the noise level is predicted to be considerably above the existing acoustic background, without mitigation (refer Table 2). The impact is, however, limited to the construction period and the project will not result in ongoing noise impacts during operation of the pipeline. The Department recognises that it will not be possible to completely eliminate construction noise and vibration impacts associated with the project so it is important that the Proponent develop strategies to minimise and mitigate noise and vibration impacts as far as practicable.

The Department consulted with the DECC regarding conditions that could be considered for inclusion in any approval granted by the Minister. The DECC made a number of recommendations in relation to construction noise goals, construction hours, mitigation measures and development of a Construction Noise Management Plan.

During standard construction hours, the DECC recommends noise goals be developed in accordance with the *Noise Control Guideline Construction Site Noise* (formerly Chapter 171 of the *Environmental Noise Control Manual*. Outside of these hours, the noise goal should be established on what can reasonably and feasibly be achieved using best practice noise mitigation. Where noise levels are predicted to exceed more than 5dB(A) above background noise, the Proponent should look at other methods to resolve noise impacts on affected residences, such as temporary relocation. For ground-borne noise, a construction noise goal of 45 dB(A) between 7am and 6pm and 40 dB(A) between 6pm and 7am should apply, except where ground-borne noise is predicted to occur for more than 7 consecutive days, in which case a noise goal of 35dB(A) should apply in the evening (6pm to 10pm).

The Department is satisfied that the Proponent can achieve these noise goals, subject to implementation of best practice noise mitigation techniques and considers that the noise goals will generally provide adequate protection for residences whilst enabling the project to be constructed. These conditions have been reflected in the Department's recommended conditions of approval.

In addition to the noise goals recommended by the DECC, the Department recommends that as part of any approval, the Proponent be required to develop a Construction Noise and Vibration Management Plan detailing how construction noise and vibration impacts will be minimised and managed. The primary objectives of the plan should be to attain the relevant noise goals and to adopt best practice noise controls. The management plan should also include the commitments outlined in the Proponent's Statement of Commitments and detail strategies for promptly dealing with any noise complaints. In the event best practice noise controls cannot substantially achieve construction noise goals, the Department recommends the Proponent implement alternative measures to resolve noise impacts on affected receivers, including, for example, temporary relocation of receivers.

The Department also recommends that a program for monitoring construction noise and vibration be developed in consultation with the DECC for the purpose of assessing compliance with the relevant goals and limits.

As noted above, the Proponent has sought approval to undertake certain construction activities 24 hours a day. The Department shares the DECC's concerns regarding the level of noise predicted to be generated during construction, particularly at night, however, it is recognised that under certain circumstances, 24 hour construction may be necessary, for example, to limit the potential for tunnelling equipment to get stuck. Accordingly, the Department recommends that should the Minister approve the project, the Proponent should be permitted to undertake 24 hour construction when trenchless construction methods are employed (excluding establishment of launch and receival pits). The Department also recommends that the Proponent be permitted to undertake 24 hour construction within Botany Bay, with the exception of trenching within one kilometre of residences, which should only be carried out during standard daytime construction hours to safeguard the community, as the Proponent's assessment has demonstrated it can generally comply with the day time criteria within this distance. Importantly, the Proponent will need to demonstrate compliance with the Construction Noise and Vibration Management Plan and should notify the local Council and potentially affected residential landowners and occupiers at least 48 hours prior to carrying out after-hours works.

Vibration impacts associated with the construction of the project have the potential to impact upon a building or structure in three main ways including, potential impacts on the integrity of buildings and structures, potential inconvenience or disturbance to occupiers and potential impacts to building contents. The Environmental Assessment identifies vibration criteria and management measures that should be imposed to meet these criteria. The DECC note that these criteria have been developed with reference to a standard other than the DECC's *Environmental Noise Management – Assessing Vibration: a technical guide*, however consider this not to be a fundamental issue as the vibration evaluation criteria are almost the same. Should the Minister approve the proposal, the Department recommends that vibration resulting from the construction and operation of the project (specifically in regard to trenchless technology) not exceed the evaluation criteria outlined in the DECC's guideline.

To further safeguard the community from impacts arising from the construction of the project, the Department recommends that the Proponent be required to undertake building condition surveys of all buildings and structures located on or within the vicinity of the pipeline route (around ten kilometres), subject to landowner agreement. Specifically, the survey area should encompass those buildings/ structures that could reasonably be affected by tunnelling/ excavation works or other major vibration-inducing construction works, determined by a suitably qualified person. Importantly, these surveys should also be carried out on those buildings/ structures of heritage significance identified in the Environmental Assessment (unless a suitably qualified person determines that it is not likely to be adversely affected by the construction of the project). The Proponent should be required to repair, at no cost to the owner, any damage to buildings/ structures attributable to the construction of the project, either directly or indirectly.

5.2 Traffic and Access Impacts

Issue

Access to properties, recreational facilities and traffic disruptions/ diversions are some of the key traffic and access related issues associated with construction of the project. As much of the pipeline is to be constructed within the road and road reserves, managing construction work to minimise disruption is paramount.

The Environmental Assessment did not clearly articulate where trenchless and trenched construction methods would be employed, rather it described the processes involved with each. This lack of certainty was one of the key reasons people objected to the project. As discussed in section 5.1, following exhibition of the Environmental Assessment, the Minister for Water Utilities announced that the laying of pipes within residential streets would be carried out using trenchless construction methods. The obvious advantage to this from a traffic perspective is that the majority of residents and businesses along these streets will be able to continue to access their property whilst the pipeline is being installed along their street. The potential downside is the location of the launch and receival pits and access implications for a small number of nearby residences which could be in place for between six and 12 months.

To minimise such impacts, the Proponent indicates that launch and receival pits will generally be located so that they do not obstruct access to property (such as locating them on private land) (see section 2.1), although in some locations, this may be unavoidable. The Proponent has committed to liaising with all affected parties to resolve access issues. Furthermore, by installing the pipeline 24 hours a day, the Proponent states that this will reduce the number of pits to be established (as further drive lengths can be achieved) which will in turn, reduce disruptions to traffic and access to properties.

As discussed in section 2.1, the alignment of the pipeline route has been refined in a number of locations in response to both further technical information being obtained and issues raised in submissions. Of particular note, are the proposed refinements between Kyeemagh and Erskineville. Specifically, part of the pipeline route is now proposed to traverse the Roads and Traffic Authority's (RTA's) corridor for the proposed F6 extension. Between Muddy Creek and Marsh Street (land currently part of the Kogarah Golf Course), the pipeline route will pass along the eastern side of the F6 corridor. This route has been refined, in consultation with Kogarah Golf Course, to avoid impacts to the long term land use of the golf course.

The route has also been refined through Tempe Recreational Reserve to minimise disruption to recreational users of the reserve following representations made by Marrickville Council. The route will also now be more closely aligned to the Alexandra Canal so disruption to traffic and residents along Hollbeach Avenue, South

Street and Swamp Road will be avoided. The Preferred Project Report also proposes to avoid busy Burrows Road by extending along the western boundary of properties along Burrows Road and traversing privately owned land and the RTA's road corridor to Campbell Road.

Depending on the outcomes of geotechnical investigations, the Proponent states that rather than the pipeline traversing Euston Road, an opportunity may exist to locate the pipeline along the eastern side of Sydney Park from Campbell Road to Sydney Park Road. The Proponent states this has a number of advantages as it would avoid the need for construction compounds within Euston Road and associated impacts on access to businesses fronting Euston Road. Similarly, an option to use trenchless construction under Mitchell Road from Sydney Park to Ashmore Street is being investigated, subject to geotechnical feasibility, and will provide an opportunity to minimise overall impacts, particularly to property access and traffic congestion.

In the Kurnell area, the main improvements to potential traffic disruptions and access resulting from the refinement of the pipeline route and construction methods include avoiding construction activities at the intersection of Sir Joseph Banks Drive and Captain Cook Drive. This road provides access to the desalination plant and other businesses including Caltex, Continental Carbon and Boral that require heavy vehicle access. This change will also ensure that evacuation procedures in the event of an incident at Caltex are not affected. In this regard, the Proponent has also committed to liaising with emergency services to ensure emergency response plans are not compromised as a result of the project.

During construction, the Proponent states that two lanes of traffic will remain open along Captain Cook Drive to minimise impacts to traffic. The launch pit for undertaking trenchless construction is proposed to be constructed within land owned by AGL on the eastern side of Captain Cook Drive to further minimise traffic impacts and to enable the cycleway to remain open.

The Proponent has committed to developing a Construction Traffic Management Plan which will provide details on how traffic impacts will be minimised during the construction phase including scheduling disruptive activities outside peak commuting hours, reducing temporary lane closures, restricting heavy vehicle movements and consulting with potentially affected landholders when undertaking work within the vicinity of their property in order to mitigate, as far as practicable, local traffic impacts such as parking restrictions, access to property and safety.

Furthermore, the Proponent states that the construction program will be designed to minimise construction time and to progressively rehabilitate areas disturbed by construction to minimise access restrictions. The Proponent has committed to working with the local councils and community to ensure that impacts to recreational facilities arising from the project are discussed and appropriate measures can be put in place to mitigate the impacts, as far as practicable.

Submissions

As noted in section 4 above, issues associated with the loss of access to property, construction disruption and loss of amenities were the most frequently raised issues of concern in submissions (16.6% of all issues raised in submissions). A further 4.4% of all issues raised in submissions related to construction traffic impacts.

Several submissions raise concern regarding the loss of access to the cycleway along Captain Cook Drive during construction of the project as it is well utilised and also general concerns to road safety for cyclists from additional heavy vehicles in the area.

A number of submissions raise concern with the potential for the project to restrict access to recreational facilities, particularly Tempe Reserve, Silver Beach and Cook Park.

The RTA raises a series of concerns over the potential for the pipeline to interfere with proposed future roads in the area. The RTA suggests a number of conditions to minimise this impact, including the pipeline being designed and constructed so that it is maintenance free within RTA classified roads and existing and future road corridors. The RTA also suggests that the Proponent consult with the RTA with respect to the project alignment and construction methods within RTA roads. A number of Councils also requested the Proponent provide details of all works within roads under Council control, including the submission of detailed traffic management plans.

Consideration

In the Kurnell area, the Department considers that the changes to the pipeline route as well as the commitment to undertake trenchless construction within residential streets will reduce disruptions to traffic and access to properties over that originally proposed in the Environmental Assessment.

The Department notes concern raised in submissions over the potential for conflicts to arise between construction activities and other road users, particularly cyclists along Captain Cook Drive. The Department considers that such potential conflicts can be adequately managed and resolved through the development and implementation of a traffic management plan which includes liaising with the Council and potentially affected road users.

From Kyeemagh to Erskineville, one of the key changes to the proposal that has the potential to result in traffic impacts, is the siting of part of the pipeline within the F6 corridor. The Roads and Traffic Authority (RTA) expressed particular concern with the pipeline's location in this corridor. Whilst its preference is for the pipeline to be located outside this corridor, the RTA recognises that the refined route responds to the needs of a wide range of stakeholders. The RTA states that if the pipeline is to be located within the corridor, it is important that the pipeline does not conflict with the future construction of any transport projects within the corridor. It recommends a series of conditions be imposed that require the Proponent to identify conflict points, mitigation measures and responsibilities aimed at protecting both transport and water infrastructure.

Whilst the siting of the pipeline within the F6 corridor has a number of advantages, such as not compromising the long term land use of the Kogarah Golf Course and moving away from the high pressure gas pipeline in the area, the Department notes that it is important that its location does not preclude any future roads within the area. Equally, any future road infrastructure in this area should not unduly impact upon the pipeline. To this end, the Department recommends a number of conditions aimed at ensuring effective communication between the Proponent and the RTA, particularly prior to the commencement of construction of the pipeline. To protect the integrity of the pipeline, the Proponent should be required to concrete encase the pipeline, or similar, at all locations at which the pipeline crosses the following roads/ road corridors: General Holmes Drive; Marsh Street, along the Alexandra Canal north of the bridge crossing near the Tempe Recreation Reserve; and all locations where the pipeline crosses existing or future road corridor between the Cooks River and Campbell Road, Alexandria. Furthermore, the project should be constructed such that it is maintenance free within any RTA road reservations and future road corridors. These recommendations are supported by the RTA and reflected in the Department's recommended conditions of approval.

With respect to access to recreational facilities, the Department notes the concerns raised in a number of submissions, including Marrickville Council, who raised specific concern with access to facilities within Tempe Reserve. The Department supports the refined route identified by the Proponent in its Preferred Project Report as it responds to Council's concerns. Whilst the siting of the construction compound at Silver Beach is a temporary inconvenience, by locating it on the beachfront, the need to occupy part of Prince Charles Parade, and hence, affect operation of the roadway, will be avoided. Similarly, the siting of the construction compound around the car park at Cooks Park, provides the least impact to the broader community.

The Department supports the Proponent's commitment to liaise with members of the local community and Council during construction of the project to disseminate information about the construction program and to provide the public with an opportunity to provide input into the development of mitigation measures to offset the temporary inconveniences created by the location of construction compounds, launch and receival pits and the pipeline itself such as through parking restrictions, access to property and safety.

The Department recommends the Proponent develop a Construction Traffic Management Protocol to detail measures to minimise construction traffic impacts, such as identification of traffic routes and timing of vehicle movements to minimise conflicts between other road users.

The Department recognises that the project is likely to result in temporary disruptions to traffic and loss of access to property and recreational facilities, however, the Department is satisfied that with the commitments made by the Proponent to minimise and mitigate such impacts, such as employing trenchless technology through residential areas and the Department's recommended conditions of approval, the project will not result in unacceptable traffic and access impacts.

5.3 Ecological Impacts

Issue

Marine Impacts

As part of the Environmental Assessment, the Proponent initially proposed to construct the pipeline within Botany Bay by trenching the length of the Bay, including through dense seagrass beds off Silver Beach. In response to the submissions received during the public exhibition of the Environmental Assessment stating their objection to such an approach, the Proponent undertook to further investigate the option of tunnelling underneath the seagrass bed and presented information on this construction technique in the Preferred Project Report. The Preferred Project Report also included information on trenching through the seagrasses using a method refined from that described in the Environmental Assessment. Details of the trenchless and trenched construction methods are described in section 2.1 of this report.

Trenching through the seagrasses to 600m offshore will disturb an area of around 9,000m^2 (that is, 600m X 15m (9m wide trench plus a distance of 6m for the temporary jetty)). Surveys undertaken by the Proponent show that only a small proportion of this area is covered by seagrasses (around 2,300m^2) (see Figure 8). In particular, the surveys suggest that only 90m^2 of the slow-growing *Posidonia australis*, will be disturbed. The Proponent states that prior to the installation of sheet piles (used to minimise the trench width), *P. australis* will be removed and transplanted in accordance with a Seagrass Management Plan that will be developed in consultation with the Department of Primary Industries. The loss of seagrasses will also be offset in accordance with a compensatory seagrass management package.

Employing a trenchless construction method to tunnel underneath the seagrasses will avoid direct impacts to this important habitat. As discussed in section 2.1, the Proponent has proposed an option of tunnelling underneath the dense seagrasses to a point around 800 metres off the beach, 200 metres beyond the dense seagrass patches. The Proponent states that owing to construction technology limitations, it is only possible to tunnel 800m offshore.

Whilst the Proponent's preferred option is to use trenchless technology under the seagrasses, it seeks the Minister's approval to have the option of either trenching through the seagrasses using the revised method outlined in the Preferred Project Report or to employ trenchless construction methods. The Proponent states that the decision to employ a particular construction method will be made following any approval by the Minister for Planning to carry out the project.

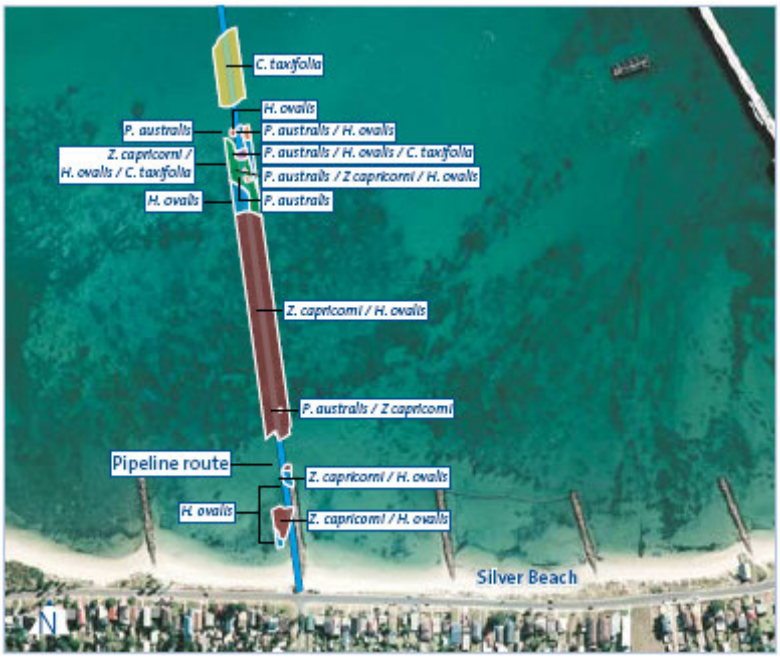


Figure 8 – Survey of Pipeline Route Showing Locations of Seagrasses

Outside of the seagrass beds, the Proponent proposes to trench the remaining length of the pipeline to Kyeemagh. As discussed in section 2.1, the trench will need to be approximately 42 metres wide to enable the deep placement of the pipeline. The dredging and the removal of surface sediments will have an adverse impact on benthic faunal assemblages. Studies have shown, however, that the recovery time of benthic assemblages on shallow estuarine sediments ranges from around six to eight months with fauna recolonising through a combination of migration of adults from adjacent areas and the settlement of propagules from the water column. The Proponent argues that while the project will impact upon the benthic community, it will recover within a relatively short timeframe.

To limit the impact from trenching, the Proponent proposes to temporarily store the spoil within the Bay and then progressively backfill using this material rather than obtaining new fill material which may not have similar characteristics to the surrounding sediments and may not be suitable for the colonisation of fauna.

Terrestrial Impacts

The Proponent undertook a field survey of terrestrial flora and fauna along the pipeline route at Kurnell and along the pipeline route from Kyeemagh to Erskineville and a literature and database record review within a 10 kilometre radius of these areas.

Within the Kurnell area, the assessment identifies that approximately 0.3 hectares of vegetation will be required to be removed to install the pipeline. This vegetation could be regarded as a degraded example of the Swamp Oak Floodplain Forest Endangered Ecological Community. The Proponent argues that this loss will not have a significant effect on the community as the removal of vegetation will largely occur along the fringe and therefore not result in further fragmentation of the vegetation. Whilst the risk of impacting the endangered Botany Bay Bearded Orchid is considered to be low, as it is known to occur near part of the route at Captain Cook Drive, the Proponent states it will undertake further targeted surveys during the flowering period to identify whether any plants are present and to protect these plants as far as practicable, such as by erecting fences around the plants. No threatened fauna species were encountered.

Overall, the assessment concludes that at Kurnell, direct impacts to terrestrial flora and fauna will be minimal as the pipeline route generally traverses along roads and road reserves with limited encroachment into vegetated areas.

The Proponent's assessment also considers that direct impacts on flora and fauna between Kyeemagh and Erskineville will be minimal as the pipeline will travel mainly along roads and road reserves and in public recreation/ sporting reserves with limited encroachment into vegetated areas. The Proponent states that potential vegetation clearance will be limited to vegetation within the path of the trenched sections of the route and the launch and receival pits where trenchless construction is proposed. The use of trenchless construction within residential streets will reduce potential risks to urban street trees as it will generally be below the root zone.

Previous work undertaken at Kogarah Golf Course has identified Green and Golden Bell Frogs at the site, however, its primary habitat is restricted to the breeding ponds at the south-west edge of the course. The route of the pipeline is not proposed to be located in this area and will not disturb the habitat. Overall, the golf course is considered to be of low ecological value.

Establishment of site compounds at Silver Beach and Cooks Park will result in the temporary loss of 3 hectares (250m x 120m) at Cook Park and between 0.5 and 1.2 hectares at Silver Beach, including temporary reclamation of land between adjacent groynes to a distance between 40 and 75 metres offshore. As a result, dune vegetation in these areas will be lost, however, this loss will be temporary and the Proponent has committed to reinstating these areas following the completion of construction.

The Proponent has also included a number of commitments to minimise the impacts on threatened species, endangered ecological communities and remnant vegetation, including siting, wherever possible, infrastructure and temporary construction sites outside of these areas. Where avoiding impacts are not possible, the Proponent proposes a number of measures to minimise them such as developing work practices to reduce damage to vegetation and fauna (for example, fencing and staff education), restoration of disturbed areas to at least pre-existing conditions and where works are undertaken in native vegetation communities, restoration using plant species from that community will be undertaken.

Submissions

Five percent of all issues raised in submissions concerned the impact of the proposal on seagrasses. Many considered the Proponent should investigate other methods of installing the pipeline through the seagrass beds of Silver Beach. The Department of Primary Industries in particular, did not support the method proposed by the Proponent in the Environmental Assessment to trench through the seagrasses and suggested that trenchless construction methods be explored.

General concern with impacts on the ecological health of Botany Bay resulting from the construction of the project was a frequently raised issue of concern in submissions (9.6%). These issues generally related to potential impacts on marine biota from suspended sediments, disturbance of contaminated sediment and acid sulfate soils and the spread of *Caulerpa taxifolia* from construction activities.

The loss of habitat from the construction of the pipeline was raised as an issue of concern, particularly where the community and Council had expended effort in rehabilitating the area. The need to protect street trees was also raised as an issue of concern.

Consideration

Marine Impacts

The Department does not support the Proponent's request for approval of both construction methodologies through the seagrasses. The need to protect seagrasses as far as practicable is of key importance. The Proponent has demonstrated that employing a trenchless construction method is technically achievable and will still result in the project being delivered on time. Whilst the Proponent states that it will develop a compensatory seagrass management package to offset the loss of seagrasses if trenching technology is employed, from a precautionary point of view, where a direct impact can be avoided, this is the preferred approach. This is particularly relevant in this case given the width of the required trench and associated jetty (that is, 15 metres). As such, the Department considers that any approval for the project should be conditional upon the Proponent employing trenchless construction methods through the seagrasses of Silver Beach. The Proponent's assessment shows that it is capable of tunnelling at least 200 metres beyond the seagrasses and the Department recommends this be reinforced in the recommended conditions.

Outside of the seagrasses off Silver Beach, the Proponent proposes to install the pipeline via trenching methods across Botany Bay to Kyeemagh. As discussed in section 5.4, the Proponent aims to achieve a turbidity goal of no more than 50mg/L above background within a distance of 100 metres from the construction activities/ trench. The Proponent argues that this limit will not result in any long term impacts to the marine environment. As discussed in the following section, the limit is not supported by the DECC or the Department as this is not best practice. It is considered that the limit of 50mg/L above background should be met just outside the silt curtains (which are required around dredging, reclamation and subsurface storage works), to limit the potential for dispersal of sediment and potential smothering of marine biota.

The development of a turbidity criterion in order to obtain instantaneous measurements is also recommended so that management decisions can be made in real time to stop water quality impacts, such as temporarily ceasing construction activities. Related to this is a requirement to monitor sediment deposition around beach and foreshore areas to ensure that habitat is not smothered by the construction works.

The Department notes a number of concerns raised in submissions in relation to the potential for the project to result in the spread of the noxious *Caulerpa taxifolia*. The Department reiterates the importance of minimising the spread of this species and recommends as a condition of approval, that the Proponent be required to employ construction methods that limit the potential for disturbing and spreading the weed.

While the Department is satisfied that impacts to marine biota will be acceptable, particularly as the Department has required the Proponent to trench underneath the seagrasses, it is considered appropriate that the Proponent monitor the ecosystem within Botany Bay to assess its health during and following construction of the project. The Ecosystem Monitoring Program should be developed in consultation with the Department of Environment and Climate Change and the Department of Primary Industries and should focus on assessing the ecological

health of seagrasses, sygnathid species and benthic biota within the Bay. Mitigation methods must be identified and implemented in the event the project is found to have a negative impact on ecological health within the Bay.

Terrestrial Impacts
The Department notes that installation of the pipeline across Botany Bay will result in disturbance to the dune habitat at Kyeemagh and Silver Beach, Kurnell. It is understood that considerable work has been undertaken in recent years by the community to rehabilitate these areas. The loss of this area as a result of the construction works is loss is not ideal, however, it is recognised that the impacts will be temporary. The Proponent has committed to developing work practices that reduce damage to vegetation and fauna and to reinstating disturbed areas following the completion of construction.

The Department supports these commitments and considers that they will serve to limit the extent of impact to terrestrial ecology. To reinforce the importance of working with the community and local Councils to minimise the impact of the project, the Department recommends that a condition of approval be imposed that requires the Proponent to rehabilitate disturbed areas in consultation with the community and relevant local Council using locally native species. The Proponent should also be required to monitor the success of rehabilitation works for a period of at least six months or until the vegetation has been successfully established.

5.4 Water Quality Impacts

Issue

The Proponent undertook an assessment of the impact of the project on the water quality of Botany Bay. In particular, the assessment focussed upon suspended sediment impacts within Botany Bay resulting from the construction of the pipeline.

As discussed in section 2.1 of this report, the installation of the pipeline within the Bay will largely be carried out using trenching methods. The trench required for the pipeline will have a footprint of approximately 42 metres (10 metres wide at the base with batter slopes of 1(vertical):4(horizontal)). A cutter suction dredge will be used to excavate the sediment to minimise the potential for dispersal of sediment. Once the pipe section has been laid, two dredge discharge barges will backfill the trench (see Figure 5).

Both dredging and backfilling of the trench will increase suspended solid concentrations in the water column. The Proponent states that the majority of sediments will settle on the seabed in the immediate vicinity of the construction activities, however, a proportion of the fine sediments will be transported away by currents which could lead to sediment plumes and increased rates of deposition. To address this issue, the Proponent has committed to installing silt curtains around the discharge barges to limit the dispersal potential for sediments.

In accordance with ANZECC guidelines, the Proponent developed trigger levels against which suspended sediment concentrations resulting from construction activities could be assessed. The Proponent aims to achieve a suspended sediment concentration of no more than 50mg/L above the background within a distance of 100 metres from the construction activities which its assessment shows can be achieved. The Proponent argues that this goal will ensure the ecological value of Botany Bay is protected. The Proponent has committed to monitoring water quality immediately adjacent to the dredging area at Silver Beach to determine compliance with this goal and ensure the seagrasses are protected from sediment transport.

While the potential for encountering contaminated sediments within the Bay is considered to be low, the Proponent states that work practices will be developed to manage any sediment-bound contaminants and potential acid sulfate soils located along the pipeline route, such as through the use of silt curtains. A Contaminated Soil and Acid Sulfate Soil Management Plan will also be prepared and will detail measures to manage any contaminated soils.

For construction work on land, the Proponent states that the key issues that have the potential to result in water quality impacts include erosion and sedimentation and exposure of potential acid sulfate soils. The Proponent has committed to developing an Erosion and Sediment Control Plan that will detail measures to manage surface water and stormwater during construction, in accordance with Landcom's *Managing Urban Stormwater: Soils and Construction*(the 'Blue Book'). As noted above, a Contaminated Soil and Acid Sulfate Soil Management Plan will be prepared.

The Proponent does not anticipate any impacts on groundwater during construction activities on land, however, to minimise any residual risk, the Proponent states that it will develop work practices during dewatering, such as reinjection, to maintain the local groundwater regime as far as practicable and to ensure that the spatial extent of any contaminated groundwater is not increased. If necessary, any identified contaminated groundwater will be contained and treated prior to discharge.

Submissions

The Department received a submission raising specific concern with the impact of construction activities within the Bay on other businesses, particularly turbidity impacts and sediment dispersal. A number of submissions also expressed concern with the potential for dredging activities within Botany Bay to stir up contaminated sediment leading to impacts on marine life. Concern was raised regarding the potential for oil spills from the work vessels impacting upon water quality.

Numerous other submissions raised concern generally with the impact of the project on water quality within Botany Bay and on land, particularly in relation to acid sulfate soils and the potential for encountering contamination (soil and groundwater).

The DECC expressed concern with a number of water quality-related issues associated with the construction of the pipeline. For the construction of the pipeline on land, the DECC note that whilst the Proponent indicates that field testing of groundwater will be required prior to construction to determine the presence of contamination, the Statement of Commitments did not specifically address the issue. As such, the DECC recommends a condition of approval to ensure that potential impacts are properly identified and managed.

Within Botany Bay, the DECC raised specific concern with the Proponent's proposed water quality trigger value for turbidity, noting that it is not consistent with the limits placed on other development within the Bay involving dredging. The DECC also expressed concern with the potential for sediment plumes and dispersal of contaminated sediment if appropriate measures are not put in place during construction, such as silt curtains. The DECC also recommended that further sediment sampling be undertaken to provide greater clarity on the potential for encountering contaminated material when laying the pipeline across the Bay and therefore, subsequent management measures.

Consideration

Marine Impacts

To limit the potential for dispersal of marine sediments and associated biota, the Department's recommended conditions require the Proponent to install silt curtains around the Silver Beach and Kyeemagh construction sites, dredge discharge barges and if necessary, the cutter suction dredges, within Botany Bay. The Proponent should also be required to meet stringent water quality limits outside of the silt curtains in order to limit surface plumes and protect marine biota from being smothered by sediments.

The DECC and the Department were not satisfied that the limit proposed by the Proponent was best practice. In particular, other dredging activities proposed within the Bay, notably, the Port Botany Expansion, have water quality limits set at achieving a turbidity level equivalent to a suspended sediment concentration of 50mg/L above the background outside of the silt curtains (and not 100m from construction works). The Department considers that the same limits should apply to this proposal in order to protect marine biota and limit the spread of sediments.

The Department also recommends the Proponent develop a Construction Water Management Plan 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. The Plan should also include a turbidity criterion that can be used to enable instantaneous measurements to be obtained to inform real-time construction practices.

The Proponent's work practices and procedures should be consistent with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000) to mitigate potential impacts on water quality (and aquatic ecology). The practices and procedures should focus upon management of sediment-bound

contaminants and acid sulfate soils located along the pipeline route and should be prepared in consultation with the DECC and the Department of Primary Industries.

To ensure consistency with the Concept Plan approval granted for the overall desalination plant, the Proponent is required to prepare a Spoil Management Plan that is consistent with the Spoil Management and Disposal Strategy developed under the Concept Plan approval. The Plan should include information on sediments within the Bay such as particle size and quality to further inform the Department and DECC on the sediments likely to be disturbed by the project and hence the potential for dispersion of contaminated sediments. The grain size of the sediments will affect the bioavailability of contaminants associated with the sediments.

As previously discussed, laying of the pipelines within the Bay will involve the use of a number of barges and vessels. To minimise the potential for oil and grease spills/ leaks, the Proponent should be required to ensure that the equipment is appropriately operated and maintained. Furthermore, the Proponent should ensure that equipment capable of responding to a worst case oil spill is available at all times to allow rapid deployment, if necessary. These recommendations are reflected in the Department's recommended conditions of approval.

With these management measures and limits in place, the Department is satisfied that the laying of the pipeline within Botany Bay will not result in an unacceptable impact on water quality within Botany Bay.

Terrestrial Impacts

The proposed pipeline route will traverse areas where contaminated groundwater may be encountered, particularly at Tempe and Sydney Park. To address this issue, the Department recommends the Proponent be required to develop a Groundwater Monitoring Protocol to detail how groundwater will be managed during construction, with specific reference to identification and management of any contaminated groundwater along the pipeline route in the Urban Sydney and Kurnell sectors.

To address erosion and sedimentation impacts arising from the construction of the pipeline, the Department recommends the Proponent develop an Erosion and Sedimentation Management Protocol, 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). An Acid Sulfate Soil Management Plan should also be prepared in accordance with guidance provided in *Acid Sulfate Soil Manual* where soil testing prior to the commencement of construction identifies the presence of acid sulfate soils.

With these management measures in place, the Department is satisfied that water quality impacts arising from the construction of the pipeline on land can be adequately managed and will not result in an unacceptable impact.

5.5 Impacts on Coastal Processes

Issue

The Proponent undertook a detailed assessment of the impact of the project on coastal processes within the Bay. This assessment was revised following the changes proposed in the Preferred Project Report with respect to construction methods within the Bay (see section 2). In particular, the assessment looked at the effect of the construction compounds and associated jetties at Kyeemagh and Silver Beach as well as the impact of the open trench during laying of the pipeline and the storage of spoil material within the Bay on wave climate and sediment transport.

The assessment shows that the project is not predicted to significantly affect the swell wave climate within the Bay and in particular, will not affect the wave climate in the vicinity of either the entrance to Port Botany or the Caltex wharf. There is predicted to be a small increase in wave activity at the airport runway as a result of the project, however, it is not expected to have any adverse impacts because the existing rock armouring protects these areas.

The Proponent's assessment shows that the beach profile at Towra Beach is dynamic and that there is presently general long-term shoreline recession. The assessment shows that the impact of this project would not result in any observable changes to the existing erosion/ deposition structure of the coastal processes at this beach.

At Lady Robinson's Beach, the Proponent's assessment predicts that there will be a 0.3m increase in sand depth near the Cooks River entrance with an equivalent recession near and north of the construction works. To address this issue, the Proponent proposes to monitor the profile of Lady Robinsons Beach throughout the construction period and if necessary, reinstate the profile to pre-construction conditions.

At the time of lodgement of the Environmental Assessment, the Proponent had not finalised its disposal strategy for spoil material within the Bay. This uncertainty was criticised by a number of submittors. Subsequently, the Proponent undertook further investigations and identified four possible options for disposal, including reclamation of the foreshore at Kyeemagh, 'ribbon-storage' of the spoil adjacent to the alignment of the pipeline, disposal within the footprint of the Port Botany Expansion project proposed by Sydney Ports Corporation and disposal within the existing dredged basin west of the first airport runway extension into Botany Bay. Disposal of the material off site and its replacement with imported fill was not considered to be acceptable due to both ecological reasons and traffic impacts. These four options were discussed with the Department of Environment and Climate Change, and the Department of Primary Industries, who gave in-principle agreement to the disposal of the spoil in the existing dredged basin (see Figure 9), which the Proponent now seeks approval for.

In particular, the Proponent states that approximately 200,000m^3 of material removed from the initial trenching within Botany Bay will be required to be temporarily stored within the existing dredged basin with ultimately approximately 35,000m^3 stored permanently. Some changes to coastal processes within the Bay are predicted to occur from the temporary storage of material, such as change in wave height of a few centimetres and a change to the shoreline in the order of 0.5m deposition/ recession over a six month period. The Proponent argues that these minor, short-term changes are unlikely to be detectable amongst other changes within the Bay and the impacts would be contained within the groyne compartments at Lady Robinsons Beach.

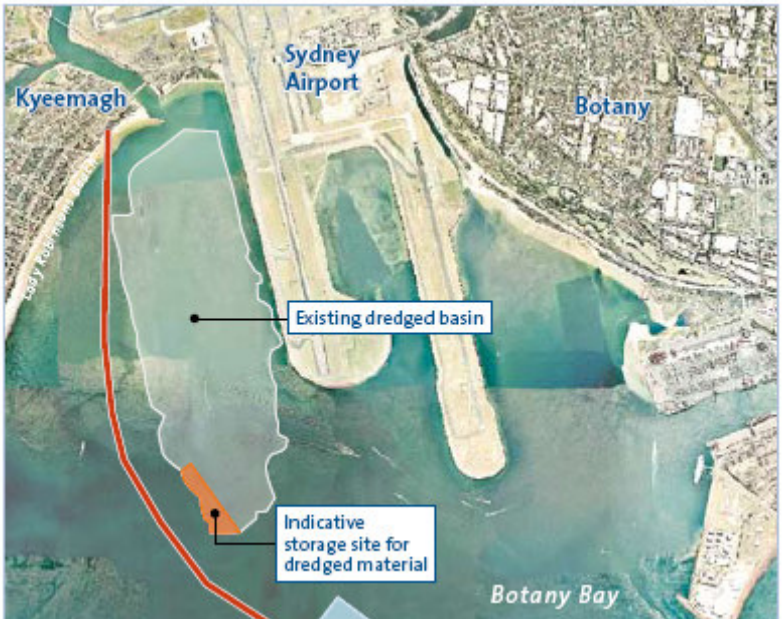


Figure 9 – Indicative Storage Location Of Dredged Material

Submissions

In response to the public exhibition of the Environmental Assessment, the Department received a number of submissions raising concern with the impact of the project on local beaches and Towra Point Nature Reserve from changes to coastal processes in the bay during construction of the project.

The Department of Environment and Climate Change and Department of Primary Industries recommend the Proponent monitor the effects of the project on coastal processes during construction and post-construction and undertake remedial works as necessary to restore the beach profile.

Consideration

The Department is generally satisfied that the impacts of the project on coastal processes within the Bay are acceptable and would not have a long term effect on the Bay.

Notwithstanding, the Department recognises that there may be some short term effects during the construction of the project such as changes to the profile of Lady Robinsons Beach. The Department also notes that the construction of the project has the potential to result in the transport of sediment within the Bay. To address this, the Department has recommended that the Proponent install silt curtains around dredging activities and the construction compounds at Kyeemagh and Silver Beach to limit the dispersal of sediment, with a requirement to meet stringent equivalent suspended sediment concentration criteria outside of the silt curtains to further reduce impacts (refer section 5.4).

The Department considers it appropriate that the Proponent undertake a comprehensive monitoring program to monitor the effects of the project on coastal processes within Botany Bay, particularly on beach and foreshore areas and should also identify source and sink areas of sediment deposition/ recession. The program should be prepared in consultation with the Department of Environment and Climate Change and Department of Primary Industries.

Should monitoring show that there has been a change to the beach profile in terms of erosion and deposition or within other locations of the Bay, the Proponent will be required to implement mitigation measures to restore these areas.

6. CONCLUSIONS AND RECOMMENDATIONS

The 2006 Metropolitan Water Plan outlines measures to be taken to enable Sydney to grow and to continue to meet its future water needs. The Plan outlines a multi-focus approach including demand management, wastewater recycling, increasing maintenance to repair leaks and new water supplies, including deep access of dams, groundwater extraction and desalination. Justification, therefore, for the desalination plant stems directly from its inclusion in the suite of water supply and management measures detailed in the Plan.

On 16 November 2006, the Minister for Planning gave concept plan approval to the Kurnell Desalination Plant, including the main plant, seawater intake and discharge infrastructure and the desalinated water delivery system (the project the subject of this assessment report). The Department is satisfied that the project, as proposed and subject to the recommended conditions, is consistent with that concept plan approval and will enable the objective of providing desalinated water to Sydney in a timely manner, to be achieved.

The Department has assessed the Environmental Assessment, Statement of Commitments, Preferred Project Report and submissions on the proposal and based on this assessment, as detailed in this report, is satisfied that the impacts of the project can be mitigated and/or managed to ensure an acceptable level of environmental performance.

Through its assessment, the Department has determined that the key assessment issues for the proposal relate to construction noise and vibration impacts, construction traffic and access impacts, ecological impacts, water quality impacts and impacts to coastal processes. A number of environmental commitments have been outlined to ensure that these issues will be addressed and the project will not result in any significant impacts to the surrounding environment.

The conditions of approval recommended by the Department have been carefully drafted to ensure that a comprehensive environmental framework is established, with a particular focus on ensuring that impacts to the amenity of residents and ecological impacts are minimised. The key recommendations include a requirement for the Proponent to undertake trenchless construction within residential areas to minimise impacts to the community. The Proponent is also required to install the pipeline using trenchless technologies under the seagrasses to protect this important habitat. Stringent water quality limits are also recommended to minimise impacts to marine biota.

In view of other infrastructure projects proposed or approved to be carried out in the Botany Bay area, including the Port Botany Expansion, proposed electricity cable across Botany Bay and the current construction of the desalination plant at Kurnell, the Department recommends the development of a Coordinated Environmental Monitoring and Management Protocol between the Proponent, Sydney Ports Corporation and Energy Australia. This Protocol requires the development of a framework for identification of opportunities for the coordinated and cooperative monitoring and management of environmental impacts, especially water quality, noise impacts, construction traffic, dust impacts, aquatic ecology and reuse of spoil in the event that construction works associated with these projects coincide.

The Department is satisfied that with the implementation of the mitigation measures proposed as part of the Proponent's Statement of Commitments, as well as additional measures outlined as part of the recommended conditions of approval, will ensure that any potential impacts are minimised to an acceptable level and the project will not unduly impact on the surrounding community or environment. Accordingly, the Department recommends that the Minister approve the project, subject to the conditions in the recommended conditions of approval provided in Appendix A.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

Refer to Chapter 11 of the Proponent's Preferred Project Report

APPENDIX C – PREFERRED PROEJCT REPORT

APPENDIX D – ENVIRONMENTAL ASSESSMENT