

4.5.2 Assessment of Modified Project

Turbidity

The proposed changes involve dredging a berth pocket at Kyemagh and storing the dredged material at a number of locations within the Bay. The impacts to water quality as a result of the proposed changes to the construction methods will be similar to those described in the PFR, and relate to:

- methods of construction (eg dredging and discharge)
- location of material storage
- amount of spoil generated
- type of material present (particle size).

As discussed in Section 4.5.1, the project includes the same management practices for minimising turbidity as the approved project, such as using a CSD which limits the potential for turbidity during dredging activities, and installing silt curtains around the discharge barges, etc. Similarly, Section 4.3, identified the location of the proposed storage sites and noted that the proposed changes reduce the amount of spoil to be disturbed overall, thereby reducing the amount of potential turbidity.

The particle sizes of the sediments determines the extent of water quality impacts as finer sediment will remain in suspension for longer periods and so will be transported further by currents. At Kyemagh, the material to be dredged from the berth pocket is clean sand, which would drop out of suspension relatively quickly.

In terms of the clay to be removed from the pipeline alignment at Kyemagh, as this material is fine, it has a greater potential to result in increases in turbidity. It is proposed to reduce the pumping distance for the clay material by storing it in the northern section of the existing dredge basin, so that there is less potential for the clays to form slurry and remain in balls with less chance of forming a plume.

Encountering PASS

While the proposed changes will not result in a change in the amount of PASS encountered, the changes allow for an alternate, superior method of PASS management. A portion of the firm to stiff clay is proposed to be dredged below the Kyemagh berth pocket (ie as part of trenching the pipeline) and has been classified as PASS, requiring management. The PASS is in a layer of clay from -5 m AHD extending to a point approximately 670 m away from the berth face. As described above, the PASS was to be removed from the site and trucked away for land based disposal. It is now proposed to permanently store this PASS material in the northern portion of the existing dredged basin. This has a number of benefits, including:

- reduced time the PASS is exposed to air, limiting oxidation and therefore potential to produce acidic leachate
- disposal within water rather than on land, requiring less trucks and handling
- allows capping of the existing contaminated materials within the dredged basin.

Exposure to air would be avoided by limiting the pumping distance to the storage area, and by carrying out underwater placement using a discharge pipeline and barge. This is consistent with the guideline document "Managing Waste Acid Sulfate Soils" (EPA Victoria, 2000) which states:

"Acid sulfate soils are a natural part of some water environments and are unlikely to cause significant impacts if deposited back into a similar environment. The risk of environmental impact from acid release during such disposal is minimal as any anaerobic (acid sulfate) sediments will remain in an anaerobic environment once deposited, except for the near surface layer. Limited oxidation of dredge spoil expected near the surface layer

may release small amounts of acid, but this will normally be neutralised by the large buffering capacity of seawater in the marine and estuarine environment".

In addition, testing results have shown that the portion of the clay layer below the PASS has significant excess acid neutralisation capacity (ie a high presence of carbonates). As the entire depth of the clay layer will be dredged, the neutralisation capacity of the carbonates in the non-PASS clay will provide a buffering capacity within the clay/sand matrix. As such, due to this buffering, and the buffering affect of seawater (EPA Victoria, 2000), it is expected that, at most, there will be minimal impacts associated with the proposed disposal of PASS clay to the existing dredge basin, and the proposed changes will result in a better outcome in terms of PASS management.

4.5.3 Management Measures / Conclusion

Overall, the proposed changes would reduce the potential impacts on water quality compared with the approved project due to the reduced amount of spoil that would be disturbed over less distance, as well as the improved management measures identified for the PASS.

In regards to ensuring turbidity is minimised, water quality monitoring will be undertaken in accordance with Conditions 2.18, 2.19 (including the proposed amendments), and 5.2e of the Project Approval. PASS will be managed in accordance with the WDA ASS and Contamination Management Plan (prepared in accordance with Condition 5.3 of the Concept Approval, Conditions 2.22 and 5.2a of the Project Approval and Statements of Commitment 3, 6 and 18). No additional Statements of Commitments are considered necessary for the proposed changes.

4.6 Other Impacts

The proposed changes have the potential to influence a number of other factors that were not specifically addressed in the EA/PPR including:

- The long term visual impacts to Silver Beach will be reduced with the removal of the permanent chamber on the foreshore
- The elimination of the quay and wharf structure at Kyeemagh will reduce the need to import fill and drive sheet piles and piles into the Bay. It will also eliminate the short term visual impacts at Kyeemagh
- The construction zone around the pipe laying operation has increased, however the duration of the lay operations across the Bay has decreased.

As such, the proposed changes reduce not only impacts associated with the key issues, but also potential impacts associated with other environmental and social factors.

5 Consultation

WDA has consulted with affected stakeholders during development of the proposed changes. This consultation has been undertaken in accordance with the project-wide Community and Stakeholder Relations Plan (CSRPP) which outlines WDA's approach to community and stakeholder relations, and the Community Stakeholder Factor Plan developed for the Sutherland Shire and Rockdale City local government areas. These documents form part of WDA's Community, Environment, Health and Safety (CEHS) Plan and identify the key stakeholders along the route, the construction activities by section, chainage and associated impacts, and the requirements and methods of community and stakeholder notification.

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

- Meetings with stakeholders, regulators / relevant government agencies including DOP, DECC, DPI, NSW Maritime, Sutherland Shire and Rockdale City Councils, as well as Sydney Ports Corporation and Energy Australia
- Preparation and delivery of fact sheets
- Monthly community updates including via the Botany Bay Crossing Newsletter
- Community information sessions and installation of shopfront locations (Kurnell and Brighton Le-Sands (in process))
- Information on the Sydney Water website, in media, advertising and signage.

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

Table 5.1: Summary of issues raised by stakeholders

Stakeholder	Issue	Where addressed in this document
DECC	• Concern that near-surface water quality monitoring does not allow for reaction time to prevent visible surface plume.	Section 2.3.6
DPI	• Management of ASS being dredged along the pipeline route at Kyeemagh • Modification of the Framework • Compensatory Seagrass Package outlined in the EA • Preparation of a Seagrass Management Plan prior to works being undertaken in the seagrasses off Silver Beach, Kurnell	Section 4.3.3 Section 4.2.3 Section 4.2.3
Sutherland Shire Council	• Access to Silver Beach	The works associated with the proposed changes will be of short duration (approximately 1 month), and is scheduled to occur during the winter months of 2009, to minimise access impacts.
Rockdale Council	• Requested to be kept informed of the project	Noted – WDA will continue to update stakeholders as relevant information becomes available, in accordance with relevant Ministers Conditions of Approval and Statements of Commitment and in accordance with the CSRPP and CSFP documents.

Stakeholder	Issue	Where addressed in this document
Caltex	- Stockpile of sand filling the Caltex berth area - Pipelines across the bay becoming exposed - Potential danger to recreational boaters due to floating ropes to moor the lay barge off Silver Beach - Protection of services associated with Caltex operation. Anchors do not disturb their services	Section 4.3 Noted – appropriate navigational controls and warning aids will be implemented in consultation with NSW Maritime. Noted – WDA will work closely with Caltex prior to mooring in the vicinity of the Caltex wharf to ensure their infrastructure/ services are protected.
Silver Beach Aquaculture	- Impacts of turbidity on their operations - Access during works	Section 4.3 Access to the Silver Beach Aquaculture business will be maintained throughout the duration of the works associated with the proposed changes. However, some restrictions to accessing the business via the western entry may be required, for safety reasons.
Cook Park Reference Panel, Kurnell and Brighton Le-Sands residents	- Impacts on seagrasses - Impacts associated with increased turbidity - Cumulative impacts within Botany Bay - Potential noise impacts - Restricted access within the Bay	Section 4.2 In accordance with Condition 3.1 of the Project Approval, WDA participates in regular meetings with Energy Australia and Sydney Ports Corporation to formulate a framework for identification of reasonable and feasible opportunities for coordinated and cooperative monitoring and management of environmental impacts from the projects. Section 4.3 The proposed lay barge operation construction zone (Figure 2.6), has increased, and will cover an area of approximately 2200m x 1950m, for a period of some 5 months (excluding the shore crossings). The area affected at any one time represents a small proportion of the total area available for fishing in the Bay. The proposed lay barge operation would move progressively across the bay at a rate of approximately 108m/day. As above (refer response for Sutherland Shire Council)
Recreational fishing groups) and users of Botany Bay (eg South Sydney Fishing Association	- Impacts on seagrasses - Impacts associated with increased turbidity - Cumulative impacts within Botany Bay - Restricted access within the Bay	Section 4.2 As above (refer response for Kurnell and Brighton Le-Sands residents) As above (refer response for Kurnell and Brighton Le-Sands residents)

WDA will continue to consult and inform stakeholders in accordance with Statements of Commitment 37 and 38, and Conditions 2.2b, 2.8, 2.10, 2.12, 2.14, 2.15, 2.16, 2.26, 4.3, 5.2b, 5.2f, 5.2g, 5.3, 5.4, 6.1 of the Project Approval.

6 Implementation

6.1 Environmental Safeguards

The environmental assessment (Section 4) undertaken for the proposed changes indicates that while there would be a reduction in potential environmental and social impacts for the project overall, there would be an increased potential for aquatic ecology impacts at Silver Beach.

The existing Statements of Commitment and Minister's Conditions of Approval are considered sufficient to manage potential impacts associated with the proposed changes. No additional or new Statements of Commitment or Conditions of Approval are considered necessary.

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

6.2 Tasks following approval of modification

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

- Information provided to stakeholders such as residents, businesses and other users of the Bay concerning the proposed works
- Management plans or procedures required by the Approvals or Statements of Commitment, including those approved by the Director-General of the DoF. This process will be undertaken in accordance with the WDA procedure for Altering an Activity Approved by the Minister.

7 Conclusion

This application for modification has been prepared to seek modification of Conditions 1.1 and 2.19 of the Project Approval and to assess the environmental impacts of the proposed changes to the construction method for the water distribution pipeline within the Botany Bay Sector of the route, between Silver Beach, Kurnell and Lady Robinsons Beach, Kyemagh.

This application for modification involves changing the following aspects of the construction method within Botany Bay Sector;

- Kyemagh beach zone construction
- Storage of dredged material
- Scale of installation operation and direction of the pipe laying
- Silver Beach bifurcation piece and pipeline
- Mooring of lay barge off Silver Beach.

This application for modification is also seeking modification Condition 2.19 which experience has demonstrated is difficult to meet due to practical constraints.

Overall, the proposed changes will reduce the environmental and social impacts, compared to the approved project.

Section 75W of the EP&A Act provides for the Minister for Planning to modify a project approval, with or without conditions. WDA has assessed the environmental impacts associated with the proposed changes and suggests modifying conditions 1.1 and 2.19 as follows:

Condition	Suggested amendment	Proposed modified condition
Condition 1.1 of the Project Approval	Add reference to this document – Desalinated Water Delivery System: Application for Modification of Project Approval for the Botany Bay Sector, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 15 July 2008;	a) Environmental Assessment of the Desalinated Water Delivery System, dated April 2007, and prepared by GHD on behalf of the Proponent; b) Desalinated Water Delivery System: Preferred Project Report, dated August 2007, and prepared by Sydney Water Corporation; c) Desalinated Water Delivery System: Application for Modification of Project Approval for the Urban Sydney Sector: Sydney North, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 5 May 2008; d) Desalinated Water Delivery System: Application for Modification of Project Approval for the Botany Bay Sector, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 15 July 2008; e) the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and f) the conditions of this approval.

Proposed modified condition	Suggested amendment	Condition
The Proponent shall ensure that construction of the Botany Bay Sector, including all dredging, subsurface storage and reclamation works, is carried out in a manner such that turbidity outside the silt curtains (as required under condition 2.18) does not exceed the background turbidity by more than an equivalent suspended sediment concentration of 50mg/L at a point of approximately 0.2 m depth for Silver Beach and between 1 and 1.5 m depth in the water column for all other sites and equipment and a distance of within ten metres from the silt curtain. No visible surface plume outside the silt curtains is permitted.	Delete: at a point mid-depth in the water column and a distance of two metres from the silt curtain. Replace with: at a point of approximately 0.2 m depth for Silver Beach and between 1 and 1.5 m depth in the water column for all other sites and equipment and a distance of within ten metres from the silt curtain.	Condition 2.19 of the Project Approval

Appendices

- A – Summary of Consistency Assessment
- B – Copy of Project Approval 07_0054 & Modification of Approval
- C – Relevant Statements of Commitment (PPR)
- D – Framework Compensatory Seagrass Package

A – Summary of Consistency Assessment

Appendix A – Summary of Consistency Assessment

A.1 Consistency with the Concept Approval

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

A.1.1 Schedule 1

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

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

a) Intake and outlet pipelines to draw raw seawater into the plant and return seawater concentrate to the ocean (including tunnelling under Botany Bay National Park);

b) Pipelines and/or tunnels from the plant across Botany Bay to the Sydney Water Corporation water supply system for the distribution of drinking water;

c) Connection of the plant to the electricity grid; and

d) Temporary laydown areas for construction use.

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

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

A.1.2 Schedule 2 – Condition 1.1

Condition 1.1 requires that:

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

a) Major Project Application 05_0082;

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

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

Condition 1.1(a) - Major Project Application

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

- On page 2 of 4 – 'pipelines and/or tunnels from the plant across Botany Bay to the Sydney Water Corporation water supply system for the distribution of drinking water';
- The changes are consistent with this reference as the project involves a pipeline from the plant to the existing water supply system for the distribution of drinking water.
- On page 2 of the attachment – 'Infrastructure to deliver water to the existing distribution network, allowing any of the following:

- 50 ML/day delivered locally to Carlingbah;
 - 125 ML/day delivered to Kyneemagh and then to the existing distribution network; and
 - Up to 500 ML/day delivered to the major water distribution system consisting of the City and Pressure Tunnels via a pipeline or tunnel across Botany Bay.
- The proposed changes are consistent with this reference as the project involves delivery of up to an annual daily average of 500 ML/day of desalinated water to the City Tunnel via a pipeline or tunnel across Botany Bay.

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

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

- EA of the Concept Plan;

- Blueprint Design;
 - EA for the Delivery System;
 - PPR for the Desalinated Water Delivery System; and
 - Detailed design following receipt of the Project Approval.
- Page 7 of the attachment acknowledged that various construction methods may be selected depending on the circumstances encountered and the outcomes of the detailed design.
- On the basis of the above, it is considered that the proposed changes are generally in accordance with the Major Project Application.

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

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

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

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

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

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

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

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

Section 2.1 of the EA of the Concept Plan states that the delivery infrastructure presented therein is indicative and may be changed during subsequent design stages. A range of studies, assessments and investigations were undertaken during development of the Blueprint Design, EA of the delivery system, PPR for the delivery system, and following Project Approval being granted for the desalinated water delivery system. The studies, assessments and investigations have proposed changes to a number of construction

methods. The main changes are described in Section 2.3 of the Application for Modification and have not altered the overall concept of delivering desalinated water to the water supply system using pipelines. On the basis of the above, it is considered that the proposed changes are generally in accordance with the EA of the Concept Plan.

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

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

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

Section 11.1.2 of the PPR for Sydney's Desalination Project stated that:

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

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

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

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

Condition 1.1(d) – Conditions of the Approval

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

- Administrative conditions (Condition 1);
- Compliance monitoring and tracking (Condition 3);
- Community information, consultation and involvement (Condition 4); and

- Environmental management (Condition 5).

Where relevant, these conditions were incorporated into the Statement of Commitments in the PPR to ensure consistency with the Concept Approval.

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

Table 3.1 Environmental assessment requirements

Requirement (as per condition 2.1 of the Concept Approval)		Consistency assessment
(a) details of the project, including route, capacity and proposed construction methods	The construction methods are detailed in Section 2 of the Application for Modification. The capacity and route is detailed in the PPR.	
(b) a detailed project-specific Statement of Commitments, consistent with the Statement of Commitments prepared for the Kurnell Desalination Plant concept plan, with a clear indication of any new or amended commitments relating to the project	Chapter 11 of the PPR.	
(c) a demonstration that the project is consistent with the requirements of this approval and generally consistent with the scope and intent of the concept outlined in the documents under condition 1.1 of this approval	This appendix.	
(d) a demonstration that the project has been designed to take into account and, where relevant, mitigate against, the impacts of wave action and coastal processes both on project integrity and as a result of the project on surrounding areas	Section 4.3 of the Application for Modification.	
(e) a demonstration that the project has been designed to minimise the loss of seagrasses during the construction and operation of the project	Section 2.3.5 and 4.2 of the Application for Modification.	
(f) a framework Compensatory Seagrass Package, developed in consultation with the DPI, detailing a framework for how any loss of seagrass associated with the project will be offset. The Package shall include consideration of new and/or protected seagrass areas, or other compensatory measures agreed by the DPI, commensurate with the extent of seagrass impacts. The Package shall also consider how the compensatory measures will be implemented, timing for any proposed works, responsibilities for on-going maintenance and monitoring and funding arrangements	Appendix D of the Application for Modification.	
(g) a demonstration that the project has been designed to minimise water quality impacts particularly in Botany Bay	Section 8.3 of the EA, and Section 4.5 of the Application for Modification.	

Requirement (as per condition 2.1 of the Concept Approval)	Consistency assessment
(h) a comprehensive water quality impact assessment for the project, undertaken in consultation with the Department of Environment and Conservation (DEC) and DPI, considering how the project will be constructed and operated to meet the outcomes specified in Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000) and to contribute to the achievement of the objectives in Marine Water Quality Objectives for NSW Ocean Water (DEC, 2006). The assessment shall make specific references to the prevention of adverse impacts on the Towra Point Reserve and commercial and recreational fishing activities in and around Botany Bay	Section 8.3 of the EA, and Section 4.5 and 5 of the Application for Modification.
(i) an assessment of potential noise and vibration impacts associated with construction of the project, and how these impacts will be mitigated, monitored and managed	Chapters 7 and 9 of the EA, Chapters 5, 6 and 7 of the PPR, and Section 4.4 of the Application for Modification.

A.2 Consistency with the Project Approval

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

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

The following sections only address those conditions relevant to the proposed changes in the context of the approved project. Conditions 1 and 2.19 were considered relevant to this consistency assessment and are assessed below.

In addition, WDA will review the Project Approval to determine whether information such as procedures and management plans required by Conditions 3 - 6 need to be amended to meet compliance obligations.

A.2.1 Condition 1.1 – Terms of the Project Approval

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

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

- a) *Environmental Assessment of the Desalinated Water Delivery System, dated April 2007, and prepared by GHD on behalf of the Proponent;*

- b) Desalinated Water Delivery System: Preferred Project Report, dated August 2007, and prepared by Sydney Water Corporation;
- c) Desalinated Water Delivery System: Application for Modification of Project Approval for the Urban Sydney Sector: Sydney North, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 5 May 2008;
- d) the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and
- e) the conditions of this approval.
- Consistency with the documents (a), (b), and (e) is discussed below. The proposed changes are not applicable to document (c). Section A.1.2 above discussed consistency with document (d).

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

The delivery system was described in Chapter 5 of the EA for the delivery system. Section 5.4 of the EA described the construction methods associated with the works in the Botany Bay Sector and stated that:

"The following description is indicative of construction methods that could be used and may be refined by the constructor during detailed design..."

Construction methods will vary along the route at the following locations:

- At the Silver Beach crossing and through the seagrass beds offshore;
- From the end of the seagrass beds offshore from Silver Beach to the beach at Kyemagh;
- Through the beach at Kyemagh.

The construction methods have been designed to minimise impacts to coastal processes and the seagrass beds near Silver Beach".

Section 5.4 of the EA reflects that the construction methods described in the EA for the delivery system were indicative and intended to be optimised during detailed design. The proposed changes are consistent with this intention.

Condition 1.2 states that in the event of any inconsistency between the documents identified in condition 1.1(a) and 1.1(b), the most recent document prevails to the extent of the inconsistency. Chapter 2 of the PPR changed the construction methods in the Botany Bay Sector from that presented in the EA for the delivery system. As such, the PPR prevails over the EA to the extent of any inconsistency. The following section assesses the consistency of the proposed refinements with the PPR.

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

Chapter 10 of the PPR defined the project for which Sydney Water sought approval. This was based on the project described in Chapter 5 of the EA as refined and changed by Chapter 2 of the PPR. As required by Section 5.4 of the EA, changes to the construction methods were anticipated as follows:

Construction methods will vary along the route at the following locations:

- At the Silver Beach crossing and through the seagrass beds offshore;
- From the end of the seagrass beds offshore from Silver Beach to the beach at Kyemagh;
- Through the beach at Kyemagh.

The construction methods have been designed to minimise impacts to coastal processes and the seagrass beds near Silver Beach".

The assessment of the environmental impacts of the refinements relative to the EA, used in the PPR for changes to the construction methods within the Botany Bay Sector were with regard to:

- Geotechnical conditions;
- Construction time;
- Environmental impact (aquatic ecology, coastal processes, noise, management of dredged material).

Chapter 10 of the PPR included changes to the construction methods within the Bay. The overriding requirement to be considered when selecting the preferred option continues to be "...that the method employed results in an environmental impact no greater than indicated by this environmental assessment".

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

Section 4 of the Application for Modification assessed the potential environmental impacts of the proposed changes and concludes that overall, the proposed changes will reduce potential environmental impacts relative to those described in the PPR.

However, the proposed changes are considered to be inconsistent with some aspects of the approved project as described in the PPR. The WDA considers that Condition 1.1 should be modified to reflect the proposed changes. In order to approve the proposed changes to the construction methods, an Application for Modification has been prepared to identify the document in the list of reference documents, as follows:

Existing approval text (Condition 1.1). Extracted from Modification of Approval 13/06/08	Proposed amendment to text
The Proponent shall carry out the project generally in accordance with the: a) Environmental Assessment of the Desalinated Water Delivery System, dated April 2007, and prepared by GHD on behalf of the Proponent; b) Desalinated Water Delivery System: Preferred Project Report, dated August 2007, and prepared by Sydney Water Corporation; c) Desalinated Water Delivery System: Application for Modification of Project Approval for the Urban Sydney Sector: Sydney North, prepared by the Water Delivery Alliance for Sydney's Desalination	The Proponent shall carry out the project generally in accordance with the: a) Environmental Assessment of the Desalinated Water Delivery System, dated April 2007, and prepared by GHD on behalf of the Proponent; b) Desalinated Water Delivery System: Preferred Project Report, dated August 2007, and prepared by Sydney Water Corporation; c) Desalinated Water Delivery System: Application for Modification of Project Approval for the Urban Sydney Sector: Sydney North, prepared by the Water Delivery Alliance for Sydney's Desalination

Project and dated 5 May 2008; d) the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and e) the conditions of this approval.	Project and dated 5 May 2008; d) Desalinated Water Delivery System: Application for Modification of Project Approval for the Botany Bay Sector, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 15 July 2008; e) the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and f) the conditions of this approval.
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Condition 1.1(d) – Concept Plan granted approval with respect to the Kurnell Desalination Plant concept plan (05_0082)

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

Condition 1.1(e) – Conditions of the Project Approval

The Project Approval includes a number of conditions with which the project must comply. These conditions relate to requirements such as environmental monitoring and auditing etc, or to other parts of the project, for example land pipeline impacts and coordination. Of these conditions, condition 2.19 relates to the application for modification.

A.2.2 Condition 2.19

WDA is seeking amendment to Condition 2.19 as a result of constraints encountered in practically implementing the condition. Condition 2.19 of the Project Approval outlines the requirements for monitoring turbidity outside the silt curtains and states:

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

The requirements to measure turbidity at "a point mid-depth in the water column" and at a "distance of 2m from the silt curtain" are relevant to the Application for Modification. Experience with monitoring the turbidity outside the silt curtain at Silver Beach has shown it is impractical to take turbidity readings at a point mid-depth in the water column and two metres from the silt curtains. A more practical condition would allow variation of the depth depending on the equipment (eg monitoring buoy, CSD or discharge barge) as well as a range in distance from the silt curtain.

WDA considers Condition 2.19 as too specific to meet given the constraints of the technology available and the effect of the tides and currents in the Bay. An Application for Modification has been prepared to obtain approval for the variation proposed in Table 2.2 of the Application for Modification, rather than "a point mid-depth" and allow a range in distance of where measurement occurs (ie within ten metres rather than a "distance of two metres") as follows:

Proposed amendment to text	Existing approval text (Condition 2.19), Extracted from original Project Approval 22/10/07
The Proponent shall ensure that construction of the Botany Bay Sector, including all dredging, subsurface storage and reclamation works, is carried out in a manner such that turbidity outside the silt curtains (as required under condition 2.18) does not exceed the background turbidity by more than an equivalent suspended sediment concentration of 50mg/L at a point of approximately 0.2 m depth for Silver Beach and between 1 and 1.5 m depth in the water column for all other sites and equipment and a distance of within ten metres from the silt curtain. No visible surface plume outside the silt curtains is permitted.	The Proponent shall ensure that construction of the Botany Bay Sector, including all dredging, subsurface storage and reclamation works, is carried out in a manner such that turbidity outside the silt curtains (as required under condition 2.18) does not exceed the background turbidity by more than an equivalent suspended sediment concentration of 50mg/L at a point mid-depth in the water column and a distance of two metres from the silt curtain. No visible surface plume outside the silt curtains is permitted.

Appendix B – Copy of Project Approval 07_0054 & Modification of Approval

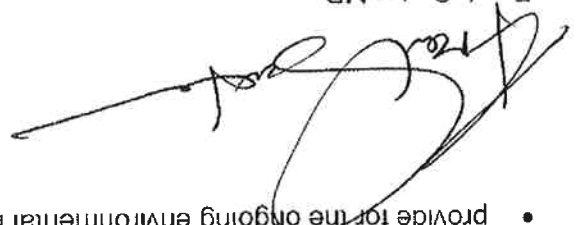
Project Approval

Section 75J of the Environmental Planning and Assessment Act 1979

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

These conditions are required to:

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



Frank Sartor MP

Minister for Planning

Sydney

22nd Oct 2007

File No: 9039739

SCHEDULE 1

Application No: 07_0054

Proponent: Sydney Water Corporation

Approval Authority: Minister for Planning

Project: "the desalinated water delivery system" project

Concept Plan:

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

Part 3A Project:

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

Concept Plan Authorisation:

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

Critical Infrastructure:

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

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SCHEDULE 2

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

1. ADMINISTRATIVE CONDITIONS

Terms of Project Approval

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

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

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

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

Limits of Approval

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

Project Sectors

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

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Construction Methods

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

Table 1 - Trenchless Technology Project Segments

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

Noise and Vibration Impacts Construction Hours

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

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

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

- 2.7 Subject to the agreement of the landowner, building condition surveys shall be completed with the following buildings/ structures prior to proximate tunnelling or excavation associated with the project:
- a) all buildings/ structures above the excavation/ tunnel and other buildings/ structures likely to be affected by tunnel/ excavation works or other major vibration-inducing construction activities in the vicinity of the buildings and structures in the Kurnell Sector and the Urban Sydney Sector. A suitably qualified person is required to certify that the survey area (and the buildings surveyed within) encompasses the maximum area that

Impacts on Buildings and Structures

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

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

- 2.5 The following construction noise goals shall apply to the project:
- a) with respect to airborne noise, a construction noise goal:
- i) developed in accordance with the DEC's *Noise Control Guideline Construction Site Noise* during the hours of construction specified under condition 2.3 of this approval;
- ii) established on the basis of what can reasonably and feasibly be achieved using best practice noise mitigation outside of the hours specified under condition 2.3 of this approval. Where applying such mitigation measures results in a noise level exceeding more than 5dB(A) ($L_{A10(15\text{-minute})}$) above rating background noise levels at sensitive receiver locations, the requirements of condition 5.2b) i) 3 apply; and
- b) with respect to ground-borne noise, a construction noise goal of:
- i) 45dB(A) ($L_{Aeq(15\text{-minute})}$) between the hours of 7:00 am and 6:00 pm;
- ii) 40dB(A) ($L_{Aeq(15\text{-minute})}$) between the hours of 6:00pm and 7:00am; except where ground-borne noise is predicted to occur for more than seven consecutive days in which case, 35dB(A) ($L_{Aeq(15\text{-minute})}$) between the hours of 10:00pm and 7:00am applies.

Noise and Vibration Goals and Limits

- 2.4 The hours of construction activities specified under condition 2.3 of this approval may be varied with the prior written approval of the Director-General. Any request to alter these hours of construction shall be:
- a) considered on a case by case basis or activity-specific basis;
- b) accompanied by details of the nature and need for activities to be undertaken during the varied construction hours;
- c) accompanied by written evidence to the Director-General that activities undertaken during the varied construction hours are justified; appropriate consultation with potentially affected receivers and notification of the relevant local council has occurred; and all practicable and reasonable mitigation measures will be put in place; and
- d) accompanied by any information necessary for the Director-General to reasonably determine that the noise impact of activities undertaken during the varied construction hours will not unreasonably impact on the acoustic amenity of receptors in the vicinity of the works.
- This condition does not apply in the event of a direction from police or other relevant authority for safety reasons or where required in an emergency to avoid the loss of lives, property and/ or to prevent environmental harm.
- c) at no time on Sundays or public holidays.
- b) 8:00 am to 1:00 pm on Saturdays; and

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

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

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

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

Traffic Impacts

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

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

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

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

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

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

2.13 At all locations at which the project crosses:

- a) an existing road corridor (or future road corridors) between the Cooks River and Campbell Road (inclusive), Alexandria,
- b) at Marsh Street, along the Alexandra Canal north of the bridge crossing near the Tempe Recreation Reserve, and
- c) at General Holmes Drive,

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

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

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

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

Soil and Water Quality Impacts

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

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

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

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

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

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

- 2.22 Prior to the commencement of construction of the Botany Bay Sector seaward of the mean high water mark, the Proponent shall develop work practices and procedures to be applied during construction to mitigate potential impacts on water quality and aquatic ecology. The work practices and procedures shall be consistent with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000) and shall include, but not be limited to management of sediment-bound contaminants and acid sulfate soils located along the pipeline route. The Proponent shall consult DECC and DPI in development of these work practices and procedures. The Proponent shall submit a copy of the final work practices and procedures to the Director-General, prior to their implementation.
- 2.23 The Proponent shall ensure that construction of the Botany Bay Sector is carried out in a manner that minimises the potential for disturbance and/ or the spread of *Caulerpa taxifolia*.
- 2.24 The Proponent shall ensure that construction and maintenance of the Botany Bay Sector, particularly dredging and land reclamation works, is carried out in a manner that minimises the potential for impacts on seagrass beds, water quality, aquatic ecology and estuarine wetland systems.
- 2.25 Where practicable, noisy or other potentially disturbing activities associated with the construction of the project within Botany Bay shall cease or be scaled back when cetaceans and other marine mammals are approaching or in the area of construction activities.
- 2.26 The Proponent shall ensure that all revegetation and rehabilitation works are undertaken, in consultation with the relevant local council, using locally native species. The Proponent shall ensure that the regeneration of revegetated/rehabilitated areas is managed for a period of six months, or as agreed by the Director-General, until the newly planted vegetation has fully established.
- Air Quality Impacts**
- 2.27 The Proponent shall construct the project in a manner that minimises dust emissions from construction areas, including wind-blown and traffic-generated dust. All construction shall be undertaken with the objective of preventing visible emissions of dust from the site.
- Waste Management**
- 2.28 All wastes generated by the project shall be beneficially reused, recycled or directed to a waste facility lawfully permitted to accept the materials.
- 3. BOTANY BAY CUMULATIVE IMPACTS AND COORDINATION**
- 3.1 Prior to the commencement of construction of the project, the Proponent shall consult with Sydney Ports Corporation (with respect to the timing of construction works associated with the expansion of Port Botany) and with EnergyAustralia (with respect to the timing of construction works associated with the Botany Bay electricity cable) to identify any potential coincident construction works between the project and those developments. Should construction works coincide, the Proponent shall consult with Sydney Ports Corporation and EnergyAustralia, as relevant, for the purposes of the development of a **Coordinated Environmental Monitoring and Management Protocol**. The Protocol shall provide a framework for identification of reasonable and feasible opportunities for the coordinated and cooperative monitoring and management of environmental impacts from the developments. The Protocol shall include, but not necessarily be limited to:
- a) procedures for access to, and provision of, monitoring data from each development, particularly in relation to water quality and ecological health;
 - b) identify and implement reasonable and feasible opportunities for coordinated and cooperative approach to the management of cumulative environmental impacts from the developments, with particular reference to water quality, noise impacts, construction traffic, dust impacts, aquatic ecology and reuse of spoil;

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

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

4. ENVIRONMENTAL MONITORING AND AUDITING

The Proponent shall provide a copy of the Protocol to the Director-General as soon as practicable after agreement on the terms of the Protocol.

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

Noise and Vibration Monitoring

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

5. ENVIRONMENTAL MANAGEMENT

Construction Environmental Management

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

5.2 In addition to the general requirements of the Construction Environmental Management System, the Proponent shall prepare and implement the following project-specific Construction Environmental Management Plans and Protocols during the construction of the project:

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

- ii) details of construction activities and a schedule for construction works;
- iii) identification of construction activities that have the potential to generate noise and/or vibration impacts on surrounding land uses, particularly residential areas;
- iv) a program for the periodic monitoring of noise emissions and vibration during construction, as required under condition 4.3;
- v) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity;
- vi) development of reactive and pro-active strategies for dealing promptly with any noise complaints, including documentation of a fast response, the completed action on a complaint and feedback from the complainant;
- vii) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, how the results of this monitoring would be recorded; and, if any non-compliance is detected with the goals and limits specified under this approval; and
- viii) mechanisms to consider and address cumulative noise impacts, particularly from other construction work potentially occurring in the area;

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

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

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

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

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

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

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

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

Operation Environmental Management

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

6. ENVIRONMENTAL REPORTING

Incident Reporting

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

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

Modification of Approval
Section 75W of the Environmental Planning and Assessment Act 1979

I, the Executive Director, Major Project Assessments Division of the Department of Planning, in accordance with the Instrument of Delegation issued by the Minister for Planning, on 7 June 2007, pursuant to section 75W of the Environmental Planning and Assessment Act 1979 determine the modification to the approval referred to in Schedule 1 in the manner set out in Schedule 2.



Executive Director

Major Project Assessments

As delegate for the Minister for Planning

Sydney

13 June

2008

File No: 9039739

SCHEDULE 1

Project Approval:

granted by the Minister for Planning on 22 October 2007 (MP 07_0054).

For the following:

"the desalinated water delivery system" project as part of the approved concept plan for the Kurnell Desalination Plant (05_0082)

Modification:

Amendments to the alignment of the Urban Sydney Sector of the project, generally in Alexandria and Erskinville.

SCHEDULE 2

The approval is modified as follows:

1. Replacing existing condition 1.1 with new condition 1.1 as follows:

- 1.1 The Proponent shall carry out the project generally in accordance with the:
- Environmental Assessment of the Desalinated Water Delivery System*, dated April 2007, and prepared by GHD on behalf of the Proponent;
 - Desalinated Water Delivery System: Preferred Project Report*, dated August 2007, and prepared by Sydney Water Corporation;
 - Desalinated Water Delivery System: Application for Modification of Project Approval for the Urban Sydney Sector: Sydney North*, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 5 May 2008;
 - the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and
 - the conditions of this approval.

2. Replacing existing condition 1.2 with new condition 1.2 as follows:

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

3. Replacing existing condition 2.1 with new 2.1 as follows:

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

Table 1 - Trenchless Technology Project Segments

Sector	Description	Location
Kurnell Sector	Under residential streets	From under Captain Cook Drive (near the Kurnell subtransmission substation) to the corner of Tasman Street and Dampier Street, and along Dampier Street to Silver Beach (Figure 10-1 of the document referred to under condition 1.1b))
	Under seagrass beds	From Silver Beach to a point around 800 metres from the mean high water mark into Botany Bay along the pipeline alignment (Figure 10-2 of the document referred to under condition 1.1b))
Botany Bay Sector	Under residential streets and watercourses	From Cook Park along Tancore Avenue and under Muddy Creek to Riverline Park (Figure 10-3 of the document referred to under condition 1.1b))
	Under watercourses	Under Cooks River (near Marsh Street) to Tempe Recreation Reserve (Figure 10-3 of the document referred to under condition 1.1b))
Urban Sydney Sector	Under major rail infrastructure	Under Botany Freight Line (Figure 10-3 of the document referred to under condition 1.1b))
	Under major road infrastructure	Under Canal Road (Figure 10-3 of the document referred to under condition 1.1b))
	Under residential streets	From Sydney Park, near the intersection of Euston Road and Campbell Road, along Euston Lane to Maddox Street and through Ashmore and Mitchell Industrial Estates (Figure 2.2 of the document referred to under condition 1.1c))
	Under residential streets	From Sydney Park, near the intersection of Euston Road and Campbell Road, along Euston Lane to Maddox Street and through Ashmore and Mitchell Industrial Estates (Figure 2.2 of the document referred to under condition 1.1c))
	Under residential streets	From Sydney Park, near the intersection of Euston Road and Campbell Road, along Euston Lane to Maddox Street and through Ashmore and Mitchell Industrial Estates (Figure 2.2 of the document referred to under condition 1.1c))

Modification of Approval

Section 75W of the Environmental Planning and Assessment Act 1979

I, the Executive Director, Major Project Assessments Division of the Department of Planning, in accordance with the Instrument of Delegation issued by the Minister for Planning, on 7 June 2007, pursuant to section 75W of the Environmental Planning and Assessment Act 1979 determine the modification to the approval referred to in Schedule 1 in the manner set out in Schedule 2.



Executive Director

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Sydney

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SCHEDULE 1

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Modification:

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The approval is modified as follows:

1. Replacing existing condition 1.1 with new condition 1.1 as follows:

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 - a) *Environmental Assessment of the Desalinated Water Delivery System*, dated April 2007, and prepared by GHD on behalf of the Proponent;
 - b) *Desalinated Water Delivery System: Preferred Project Report*, dated August 2007, and prepared by Sydney Water Corporation;
 - c) *Desalinated Water Delivery System: Application for Modification of Project Approval for the Urban Sydney Sector: Sydney North*, prepared by the Water Delivery Alliance for Sydney's Desalination Project and dated 5 May 2008;
 - d) the concept plan approval granted with respect to the Kurnell Desalination Plant concept plan (05_0082); and
 - e) the conditions of this approval.

2. Replacing existing condition 1.2 with new condition 1.2 as follows:

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

3. Replacing existing condition 2.1 with new 2.1 as follows:

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

Table 1 - Trenchless Technology Project Segments

Sector	Description	Location
Kurnell Sector	Under residential streets	From under Captain Cook Drive (near the Kurnell subtransmission substation) to the corner of Tasman Street and Dampier Street, and along Dampier Street to Silver Beach (Figure 10-1 of the document referred to under condition 1.1b))
Botany Bay Sector	Under seagrass beds	From Silver Beach to a point around 800 metres from the mean high water mark into Botany Bay along the pipeline alignment (Figure 10-2 of the document referred to under condition 1.1b))
Urban Sydney Sector	Under residential streets and watercourses	From Cook Park along Tancred Avenue and under Muddy Creek to Riveline Park (Figure 10-3 of the document referred to under condition 1.1b))
	Under watercourses	Under Cooks River (near Marsh Street) to Tempe Recreation Reserve (Figure 10-3 of the document referred to under condition 1.1b))
	Under major rail infrastructure	Under Botany Freight Line (Figure 10-3 of the document referred to under condition 1.1b))
	Under major road infrastructure	Under Canal Road (Figure 10-3 of the document referred to under condition 1.1b))
	Under residential streets	From Sydney Park, near the intersection of Euston Road and Campbell Road, along Euston Lane to Maddox Street and through Ashmore and Mitchell Industrial Estates (Figure 2.2 of the document referred to under condition 1.1c))

C – Relevant Statements of Commitment (PPR)

Appendix C - Relevant Statements of Commitment

Aquatic Ecology

Desired Outcome	Action	Timing
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Seagrass habitat loss minimised and the remaining large bed of Posidonia at Silver Beach protected during construction of the Botany Bay pipeline.	3. If required, a Seagrass Management Plan will be prepared, in consultation with DPI, for implementation during, and post-construction, to minimise impacts of the pipeline crossing of Silver Beach, Botany Bay on the aquatic environment as far as practicable. This Plan will be linked to the construction contract and will include: a. Further assessment of seagrasses at Silver Beach (i.e. to minimise the area of disturbance to <i>Posidonia</i>, as priority, and <i>Zostera</i>) if the preferred route requires alteration; b. The remaining large bed of <i>Posidonia</i> at Silver Beach to be protected; c. Use of sheet piling within seagrass habitat, with turbidity screens at the ends of each segment of construction, as a means of minimising habitat loss and controlling turbidity; d. Dredging activities to be carried out to prevent sediment deposition over the seagrass beds and minimise turbidity in Botany Bay immediately adjacent to the dredging area; e. Monitoring of water quality immediately adjacent to the dredging area; f. Construction to occur over the shortest possible time to minimise disturbance and reduce the risk of exposure to storms and identify measures to be taken during adverse weather conditions; g. Relocation to suitable habitat of any synanthids, if observed in the immediate vicinity of the area of impact; h. Measures to minimise adverse impacts on coastal processes; i. A monitoring program to detect impacts to seagrass adjacent to the trench at Silver Beach; j. Submission of the Plan to the Department of Planning.	During design (before construction commences).
Seagrass habitat loss minimised and the remaining large bed of Posidonia at Silver Beach protected during construction of the Botany Bay pipeline.	3. A Compensatory Seagrass Package will be developed in consultation with the DPI, detailing how any loss of seagrass associated with construction across Botany Bay will be offset. The package will also include a program for maintaining and monitoring seagrass restoration will be developed in consultation with DPI for implementation for 12 months post-construction.	During design (before construction commences).
Control potential dispersion of existing contaminated sediments during construction of Botany Bay pipeline.	3. Work practices will be developed to manage sediment-bound contaminants and acid sulphate soils located along the pipeline route (as detected by geotechnical testing) for implementation during construction. This may include where possible, the adoption of least impact construction dredging and the use of controls such as silt curtains.	During design (before construction commences).
No significant or irreversible impacts from dredging on sensitive natural ecosystems, oyster leases or aquaculture activities during construction of the Botany Bay pipeline.	6. Dredging activities will be carried out to minimise turbidity in Botany Bay immediately adjacent to the dredging area and to minimise potential impacts on sensitive natural ecosystems, oyster leases or aquaculture activities.	During design (before construction commences).

Noise

Desired Outcome		Action	Timing
The community and stakeholders have a high level of awareness of all processes and activities associated with the delivery system; Provision of accurate and accessible information; and A high level of responsiveness to issues and concerns raised by the community.		34. Communities directly impacted by construction will be provided with detailed information on the nature and timing of the proposed works including: a. Sydney Water will work with local Councils, stakeholder groups and the community to identify local issues and concerns prior to the commencement of construction to ensure that appropriate measures are put in place to mitigate local impacts; b. Measures will address issues such as access, local amenity, safety and traffic management; and c. Local communities will be consulted should site restoration works be required following construction.	During design (before construction commences).
Communications Processes		35. Communications processes will be developed and implemented at appropriate times with impacted communities throughout delivery of the delivery system. These will include: a. Opportunities to input to mitigation measures for construction or operations; a. Methods to inform the community of the progress and performance of the project and issues of interest to the community; b. Notification of construction activities to potentially affected local residents and businesses; c. Processes to receive and manage complaints in accordance with Sydney Water's customer contract; d. Consultation with affected property owners including property inspections, where appropriate; e. Induction and training of construction personnel in communications requirements; and f. Protocols to notify stakeholders of relevant activities and any incidents should they occur.	During design (before construction commences).

Water Quality

Desired Outcome	Action	Timing
Water Quality and Aquatic Ecology		
Control potential dispersion of existing contaminated sediments during construction of Botany Bay pipeline.	3. Work practices will be developed to manage sediment-bound contaminants and acid sulphate soils located along the pipeline route (as detected by geotechnical testing) for implementation during construction. This may include where possible, the adoption of least impact construction dredging and the use of controls such as silt curtains.	During design (before construction commences).
No significant or irreversible impacts from dredging on sensitive natural ecosystems, oyster leases or aquaculture activities during construction of the Botany Bay pipeline.	6. Dredging activities will be carried out to minimise turbidity in Botany Bay immediately adjacent to the dredging area and to minimise potential impacts on sensitive natural ecosystems, oyster leases or aquaculture activities.	During design (before construction commences).
Contaminated soils and acid sulphate risks managed during construction in accordance with guidelines.	18. A Contaminated Soil and Acid Sulphate Soil Management Plan will be prepared to identify and manage contaminated soils for implementation during construction including: a. Field investigations to confirm presence of soil contamination and measures to avoid and mitigate impacts on sites; b. Methods to classify spoil for disposal in accordance with Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Waste (EPA, 1999); c. Procedures to properly assess and manage any previously unidentified areas of contaminated soils encountered; and d. Confirming presence of potential acid sulphate soils and developing management and disposal options for acid sulphate soils consistent with the Acid Sulphate Soil Manual (Acid Sulphate Soil Management Advisory Committee, 1998).	During design (before construction commences).

D – Framework Compensatory Seagrass Package

Appendix D – Framework Compensatory Seagrass Package

This Framework Compensatory Seagrass Package has been developed in consultation with DPI. As outlined above, it is estimated that a relatively small amount of seagrass in the vicinity of Silver Beach could be damaged during the lay barge operations. The amount will be determined by surveying the seagrasses in the vicinity of the works before and after the lay barge operations. It is anticipated that there will be very limited damage to the *Posidonia* in the vicinity of Silver Beach. Due to the limited nature of disturbance to the *Posidonia* it is considered inefficient to transplant the *Posidonia* as described in the EA.

Once lay barge operation through the seagrass has been completed, further monitoring will be undertaken by in accordance with the WDA Ecosystem Monitoring Program. The final survey data will be used to determine the final value of the Compensatory Seagrass Package.

The value of the Compensatory Seagrass Package will be based on a compensation value for the removal of *Zostera* and *Posidonia* that is consistent with DPI's valuation policy and linked to the area of *Zostera* and *Posidonia* removed during construction.

WDA will fund the Compensatory Seagrass Package and DPI will undertake projects funded by the package. Projects funded by the Compensatory Seagrass Package are intended to provide additional information to inform and increase the success of future transplanting programs. These projects may include research into the following requirements of seagrass:

- Nutrient requirements, including types of nutrients, levels required in the sediment to support the seagrass, potential for use of suitable fertilisers, and potential for use of hormones;
- Substrate characterisation, including grain size, density, stability, mixture, oxygen levels in the sediment, and pH;
- Light requirements, including photosynthetic requirement for transplants and natural systems;
- Impacts of coastal process on seagrass beds, including critical wave energy regime to allow seagrass to grow;
- Techniques for seagrass transplantation and trials;
- Development of a decision support tool for future seagrass transplantation; and
- Providing educational and interpretive opportunities for the public and special interest groups.

Seagrass habitat outside the nominated construction zone will be protected during construction. DPI requires that WDA provide an environmental bond as there is the potential for indirect impacts on seagrass beds beyond the construction zone at Silver Beach.

The extent of indirect impacts will be influenced by the method of construction ultimately selected. Once the construction method is selected, WDA and DPI will estimate an area that has the potential to be indirectly impacted by construction. DPI requires that WDA lodge a bond to cover the area potentially indirectly impacted and the value of this bond will be determined using the same valuation scale used for seagrass removal. DPI advised that the bond is intended to provide WDA with certainty as to the overall cost of the Compensatory Seagrass Package.

MCoA 4.1 includes an Ecosystem Monitoring Program to monitor impacts to seagrasses as a result of the project at Silver Beach. The results of the monitoring will be used to determine the proportion of the bond payable to DPI.

