Port Kembla Outer Harbour Development

Modification Application No. 2 - Additional Stockpiling Capacity for Construction Materials

1. Proposed Terms of Modification

Port Kembla Port Corporation (PKPC) seeks approval to modify the Project Approval for Stage 1 (1A, 1B, and 1C) of the Outer Harbour Development as follows:

I. Add to the list within Condition A1 (Terms of Approval) the document *Port Kembla Outer Harbour Development Modification Application No. 2 – Additional Stockpiling Capacity for Construction Materials*, prepared by Port Kembla Port Corporation and dated 1 August 2012. Amend condition A2 to reflect the addition to A1.

II. Add a new condition (C39) to Part C of Schedule 2 as follows:

Any stockpiling works in addition to those described in the documents listed under condition A1 shall be approved by the Director-General prior to establishment. The Proponent shall prepare an assessment report(s) demonstrating how potential impacts shall be mitigated and managed to an acceptable standard, including demonstrating consistency with the project impacts identified in the documents listed under condition A1. The assessment(s) shall include, but not be limited to:

(a) a description of the stockpiling works including their location, hours of receival and stockpiling, nature of material to be stockpiled, stockpile dimensions, duration of receival and stockpiling works;
(b) materials delivery, including transportation mode and number of deliveries;
(c) an assessment of the environmental impacts on the site and surrounding environment and land uses including (but not limited to) noise, air quality, traffic and access, water quality, visual amenity, heritage, flora and fauna;
(d) details on the mitigation, monitoring and management procedures that would be implemented to manage and/or minimise environmental impacts;
(e) procedures for ensuring stockpile stability; and
(f) demonstrated overall consistency with the approved project.

The assessment report shall be submitted for the approval of the Director-General at least four weeks prior to the commencement of receival and stockpiling works, or as otherwise agreed by the Director-General. Receipt and stockpiling of materials shall not commence until written approval has been received from the Director-General.

Such assessment(s) can be submitted separately or as part of a Construction Environmental Management Plan submitted under condition C37 of this approval.

2. Introduction

Port Kembla Port Corporation (PKPC) is currently proceeding with a major redevelopment of the Port Kembla Outer Harbour to cater for anticipated new trades and growth in existing trades. The Outer Harbour Development (OHD) will ultimately create 42 hectares of new port land by partial reclamation of the existing harbour area. This land will support trade over 7 land-backed wharves

that will be designed to suit the needs of modern commercial ships carrying bulk, break-bulk and containerised cargoes.

PKPC is seeking suitable fill materials that can be placed within the footprint of the OHD for the purpose of reclaiming land from the harbour. Air-cooled blast furnace slag (ABFS) from local industry has been used as reclamation fill for the initial component of construction, known as Stage 1A Reclamation Works. However, due to reduced steel production and other operational changes at the Port Kembla Steelworks, ABFS is no longer available for use as reclamation fill. As a result, PKPC is looking further afield for materials to meet its requirements for future components of the development. Large construction projects in the Illawarra and Sydney metropolitan areas are potential sources of rock and, in a few cases, may also generate finer, granular materials that are suitable for use within the OHD. The timing for the availability of excavated materials from construction projects is typically driven by the schedules of those projects rather than the OHD construction schedule. In circumstances where large sources of suitable materials become available in advance of OHD works, there is strategic value in acquiring these materials and storing them in stockpiles within the port for future use.

PKPC has recently identified 2 construction projects which will generate materials whose qualities and quantities are well suited for use in the next component of OHD reclamation work. These projects are:

i. The West Keira retail/commercial/residential development that is being undertaken by the GPT Group in Wollongong CBD. This project shall deliver up to 60,000 m^3 of hammered sandstone rock to the Outer Harbour by road transport.

ii. Bulk Excavation works at the Barangaroo South development in Sydney that is being undertaken by Lend Lease. This will generate up to 300,000 m^3 of suitable fill for reclamation purposes to be delivered by ship to the Outer Harbour.

PKPC shall stockpile the materials received from the above sources on land within the OHD footprint for future use in construction activities. It is envisaged that the materials will be used for construction of the first multi-purpose berth and associated cargo handling terminal within the OHD. Later stages of the development may also require storage of similar volumes of construction materials that will be sourced in accordance with the approval conditions.

The approved project description includes allowance for 100,000 m^3 of material stockpiling which, under the circumstances described above, is insufficient. Therefore, a modification is sought to allow for storage of additional material in stockpiles within the OHD footprint. The stockpiles are initially intended to accommodate materials from the sources described above. However, PKPC seeks the flexibility to stockpile similar amounts of other suitable materials in appropriate locations within the OHD for later stages of the OHD, if required. In all cases it is proposed that any stockpiles created will be subject to the relevant conditions contained within the existing Project Approval, including preparation of a comprehensive construction environmental management plan.

3. Planning and Statutory Approvals Context

On 3 March 2011 the Minister for Planning approved a Concept Plan for the complete OHD over a 25+ year timeframe. The Concept Plan indicates that the development shall proceed in 3 stages. In

conjunction with the Concept Approval, the Minister also granted Major Project Approval for Stage 1 of the development which may require 8 years or more to complete (approval number MP 08_0249). Approvals were granted after consideration of an Environmental Assessment (EA) report prepared by AECOM (2010) on behalf of PKPC, and public submissions made in response to exhibition of the EA. Stage 1 construction activities have been further broken down into 3 sub-stages, known as Stages 1A, 1B and 1C (refer to section 6.4 of the EA).

The scope of works covered by the Stage 1 Project Approval includes approximately 90% of the reclamation works required to accommodate the operational facilities proposed in the Concept Plan. The rationale for obtaining approval for such a large area of reclamation was to allow PKPC to take advantage of suitable materials as they became available such that land could be created cost effectively and with minimal impact on natural resources of rock and granular materials.

Temporary stockpiling of reclamation materials is also included within the description of the approved project. Figure 6.1 of the EA identified a portion of land, west of the Darcy Rd Drain, within the Outer Harbour for the temporary stockpiling of materials for the construction of the OHD. The EA describes a stockpile of 100,000 m^3 capacity to be utilised during construction of Stage 1A, 1B and 1C reclamation areas.

Section 6.4.4 of the EA lists a series of potential sources of fill materials for OHD reclamation including *"Large building projects involving ground excavation".* The option of transporting fill by sea to Port Kembla is also proposed in this section of the EA.

Condition B17 of the Project Approval establishes requirements for fill materials to be used in the OHD as follows:

> *B17 All imported fill material shall be classified as Virgin Excavated Natural Materials (VENM), unless applied in accordance with the terms of a Resource Recovery Exemption under the Protection of the Environment Operations (Waste) Regulations 2005, or as otherwise agreed by the Director General.*

The rock sourced from the West Keira site has been classified as VENM on the basis of in-situ sampling and assessment. In June 2012, the Department of Planning & Infrastructure (DP&I) approved a Construction Environmental Management Plan (CEMP) for receival and stockpiling of up to 60,000 m^3 of rock at the OHD site. The CEMP proposed utilising an alternative area to the east of Darcy Rd Drain for stockpiling so as to leave space for larger volumes of material on the western side.

The proposed use of Barangaroo South material as fill for the OHD shall be covered by a specific Resource Recovery Exemption under the *Protection of the Environment Operations (Waste) Regulation 2005 (POEO Waste Reg)*. Lend Lease has applied, with cooperation and support from PKPC, to the Environment Protection Authority (EPA) for an exemption that will allow the material to be shipped to Port Kembla, stockpiled and used as reclamation fill material, both above and below water level. It is expected that the exemption shall include conditions imposing a detailed environmental specification for the material plus sampling and testing requirements upon Lend Lease to demonstrate compliance with those criteria. A draft exemption was issued on 26 July 2012 and is expected to be finalised in the near future.

The EPA has also indicated that it will require PKPC to obtain an Environment Protection Licence (EPL) for storage of the fill to be obtained from Barangaroo South. PKPC has applied for an EPL and is currently negotiating the terms of this licence with EPA.

The material to be delivered to the Outer Harbour site will be excavated as part of the approved project (MP 10_0023) for Bulk Excavation and Basement Car Parking at Barangaroo South. Lend Lease (Millers Point) Pty Ltd is the Proponent for the Barangaroo project and is responsible for all aspects of the excavation, processing and shiploading of material destined for Port Kembla. It is understood that Lend Lease has obtained all necessary modifications to its planning approval to allow for export of the Barangaroo South fill material by ship and has obtained a variation to its Environment Protection Licence No. 13336 to allow shipping in bulk from the premises.

Material shall be unloaded at the Port Kembla Gateway (PKG) terminal in the Outer Harbour which routinely handles a range of dry bulk cargoes for both import and export. PKG holds an existing Environment Protection Licence No. 702 for "Shipping in Bulk" at its facility. All activities associated with shipping movements, vessel unloading and truck loading at the terminal shall be managed in accordance with the licence and current environmental management practices that are the responsibility of Port Kembla Gateway.

4. Project Status – Outer Harbour Development Stage 1A

Construction activities for Stage 1A of the OHD are being undertaken in a number of discrete components as summarised in Table 1 below.

Construction Activity	Description	Status	Expected Completion
Stage 1A Reclamation Works	Reclamation of 6.9 ha with ABFS and quarry overburden	95% complete (all materials delivered)	August 2012
Rock Receival and Stockpiling	Receive up to 60,000 m^3 of rock by road from West Keira and stockpile east of Darcy Rd Drain	Commenced July 2012	December 2012
General Fill Receival and Stockpiling	Receive up to 300,000 m3 of fill by ship from Barangaroo South and stockpile west of Darcy Rd Drain	Pending approvals – expected to commence August 2012	December 2012

The 6.9 ha footprint of Stage 1A Reclamation Works is now established to a height well above the water line and all perimeter structures are complete. The final remaining task involves dismantling a surcharge stockpile of blast furnace slag and spreading the material over the north-eastern portion of the reclamation site to achieve the design level of RL 4.0 m. This task is expected to take 2-3 weeks to complete.

The supply of rock from the West Keira site is currently progressing well. The expected completion date is subject to a range of factors, including the productivity of rock hammering activities and

potential weather delays. For this reason the CEMP proposes a period of up to 12 months for this activity.

PKPC is currently preparing a CEMP for the receival and stockpiling of general fill from Barangaroo South for approval by the DP&I with a view to commencing the activity in August 2012. The DP&I has indicated that, under the terms of the existing project approval, it would be willing to approve receival and stockpiling of up to 100,000 m^3 of bulk material in total for the OHD construction. Therefore a modification is sought to allow receival of the entire parcel of Barangaroo South material in addition to that from West Keira.

PKPC is currently progressing a review of requirements for the first multi-purpose berth and associated dredging and spoil disposal activities. As indicated above, it is this construction component that will utilise the rock and fill materials that shall be stockpiled in the Outer Harbour. PKPC anticipates that berth construction and dredging may commence towards the end of 2013. However, the timing of this activity is ultimately subject to market demand and, although the current indications are positive, a firm commitment is not expected until the second half of 2013.

5. Description of Stockpiling Activities

PKPC proposes to establish two major stockpiles of construction materials in the Outer Harbour to a total estimated volume of 360,000 m^3 as depicted in Figure 1. Further description of these activities is provided below. As mentioned above, the CEMP for receival and stockpiling of rock from West Keira has already been approved by DP&I. However, it is included in the description below because the proposed modification is to allow for both rock and fill stockpiles to be constructed concurrently.

5.1. Rock Receival and Stockpiling from West Keira

West Keira is a large building project in the Wollongong CBD which involves excavation of a significant quantity of hard sandstone rock that constitutes suitable coarse material for the construction of containment walls within the OHD. Use of the West Keira material is preferable to the other materials described in Section 6.3.11 of the EA because:

- It makes beneficial re-use of a by-product of the West Keira development, thus avoiding the need to excavate natural interburden rock from local quarries.
- The transport of the material from the West Keira site to the Outer Harbour is a single trucking campaign avoiding the need for 2 separate campaigns to dispose of the West Keira rock and supply suitable material to the OHD.
- Uncrushed blast furnace slag will not be available beyond the current Stage 1A reclamation works due to the reduction in iron production at the BlueScope Steelworks.

The rock is very high strength sandstone. The rock size will be up to 500mm maximum dimension with a minimum of fine materials. The majority of material will have dimensions within the range of 150mm to 400mm. Assessment on the sizing classification of the rock will take place at the excavation and loading location at the GPT site. The rock is classified as Virgin Excavated Natural Material (VENM) under the *EPA Waste Classification Guidelines* to satisfy Conditions B17 and B18 of the OHD Project Approval.

Typical trucking movements are 6 to 9 deliveries per hour during extended construction hours (ie: 7 am to 6 pm Monday to Friday and 8 am to 5 pm Saturdays. No work on Sundays or public holidays). The delivery rate is dependent on the rate of excavation and handling of material on the GPT site. Trucks travel along an approved haul route to Five Islands Rd at Port Kembla, then on to Flinders St, Old Port Rd and Foreshore Road before entering the site via the Foreshore Rd gates.

The material is being received at the Outer Harbour on vacant land off Foreshore Road, south of the reclamation area, east of the Darcy Road Drain in an area that is approved for the storage of construction materials to be used in the OHD. The footprint of the stockpile is approximately 1 ha (10,000 m^2) in total area. Over the footprint area the stockpile is being built to a height of up to 10 metres. Rock is stockpiled using earthmoving equipment (either excavator, dozer or front-end loader).

5.2. General Fill Receival and Stockpiling from Barangaroo South

A further opportunity for PKPC to receive and stockpile general reclamation fill material has arisen as a result of the development by Lend Lease of the Barangaroo South precinct in the Sydney CBD. The benefits associated with the utilisation Barangaroo South fill in the OHD, include:

- Beneficial re-use of material that may have otherwise been sent to landfill for disposal.
- Transport by ship to Port Kembla avoiding up to 35,000 truck movements through the Sydney CBD and likewise avoiding a similar number of truck movements to and from the OHD site at Port Kembla.
- The material has demonstrated suitable properties for use as reclamation fill in its current location at Barangaroo South and is suitable for similar use within the OHD

The fill consists of up to 300,000 m^3 of material that is predominantly crushed sandstone with some minor quantities of clayey material and building waste. The material has been intensively sampled and tested to identify hotspots of contaminated materials that will be excavated for separate disposal. Further sampling and inspections will be undertaken as the material is excavated and screened to ensure that it meets the strict requirements of the Resource Recovery Exemption before it is dispatched to Port Kembla.

The engineering properties of the material make it suitable for use as below-water reclamation fill in future components of the OHD. The Barangaroo South material shall be stockpiled in the Outer Harbour on land west of Darcy Rd Drain. It is then anticipated that the fill material shall be used in reclamation works to extend the current footprint of Stage 1A Reclamation Works.

Up to 300,000 m^3 (i.e. 600,000 tonnes) of material will be transported to the Outer Harbour by ship over a period in the order of 12-20 weeks commencing in August 2012. The material will be transported by self-unloading ship in shipments of approximately 20,000 - 25,000 tonnes from Wharf 8 at Darling Harbour East (adjacent to the Barangaroo South site) to the Port Kembla Gateway terminal in the Port Kembla Outer Harbour. It is expected that a typical shipping cycle will involve a shipment arriving at Port Kembla every 4-5 days.

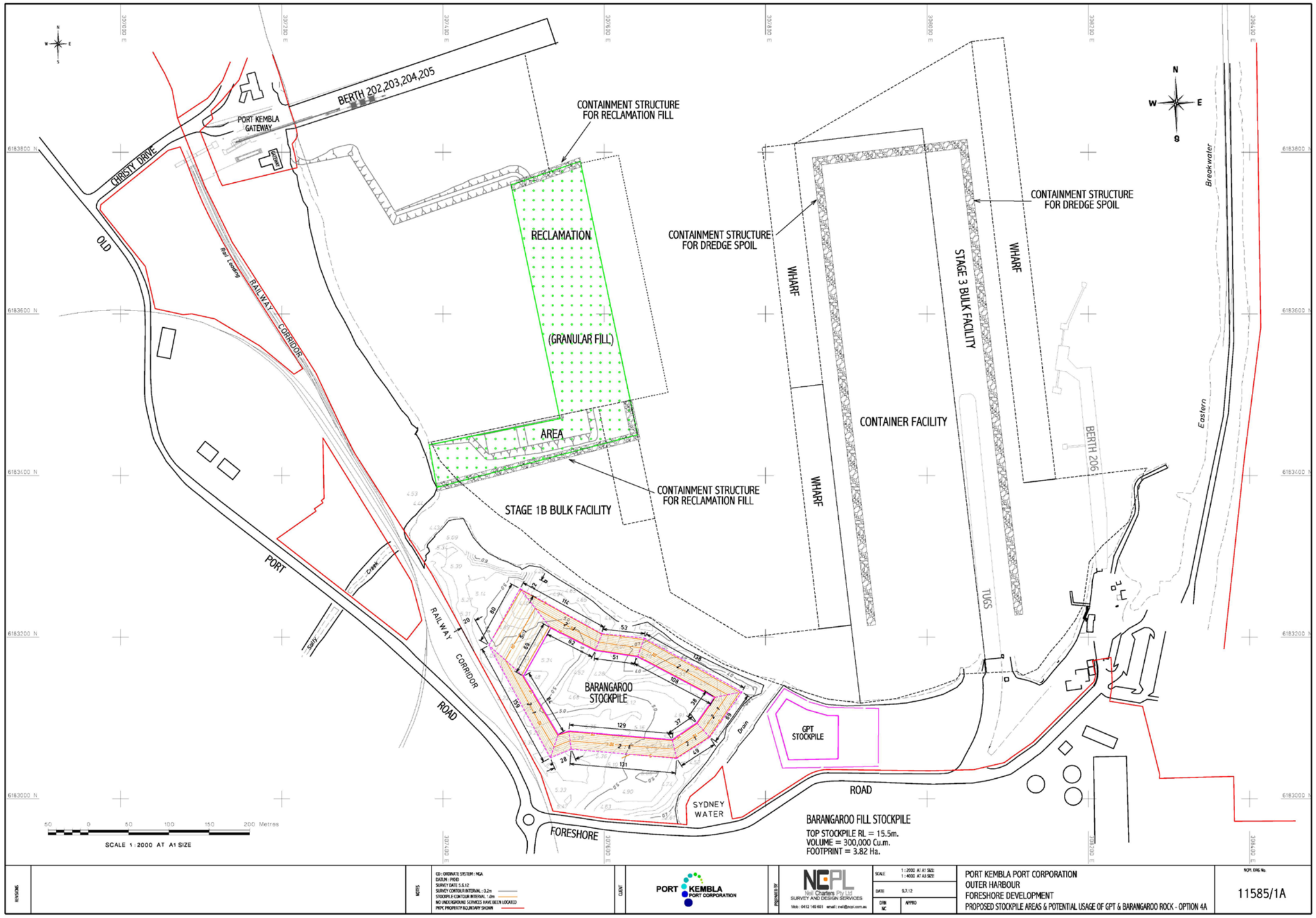
The Port Kembla Gateway terminal consists of a timber jetty with concrete decking and berthing facilities for 2 ships (i.e. Berths 202 and 203). The ship delivering material from Barangaroo South will enter the port and berth at the jetty in accordance with normal port operating practices. The ship is equipped with deck cranes, grabs, hoppers, conveyors and a discharge boom that will be used to retrieve material from the hold and convey it from the vessel in a controlled manner at an estimated rate of 400-500 tonnes per hour. Vessel discharge shall be a continuous, round-the-clock operation for a typical period of 40-60 hours per visit. This terminal operates under its own EPA licence. Receival of this material is a typical activity that occurs under that licence.

Upon discharge from the ship, material shall enter a mobile mechanical hopper standing on the deck of the jetty. The hopper stands 9 m high and has a capacity of 50 m^3 (i.e. 100 tonnes). The hopper is equipped with a hydraulically powered mechanism to open and close the door at its base that will be used to deliver material into semi-trailers that drive under the hopper. The hopper is regularly used at Port Kembla Gateway for the importation of a range of dry bulk cargoes.

A fleet of 6-10 semi-trailers (depending on discharge rates) will transport the material from the jetty to the stockpile location via an internal port haulage route. The unsealed, but well-formed and compacted internal haul route has been already established for the Stage 1A Reclamation Works. The haul route will be regularly maintained with the use of a water cart, grader and roller to minimise the potential for dust and water erosion.

The proposed stockpile site is a relatively flat area of vacant port land situated between Salty Creek and the Darcy Road Drain. The stockpile shall occupy a footprint of about 3.9 ha and stand up to 11 m high. A dozer and excavator shall be used to progressively push up and trim the stockpile. A roller shall be used to maintain a compacted surface on the stockpile to minimise rainwater infiltration to the stockpile.

Figure 1. Proposed construction material stockpiles for Stage 1 of the Port Kembla Outer Harbour Development



6. Environmental Impacts of Proposed Additional Stockpiling

This section presents an assessment of the potential environmental impacts associated with the proposed receival and stockpiling activities described in Section 5 above. The key impacts for consideration are:

- Traffic
- Noise
- Air Quality
- Visual Amenity

The impacts of the proposed modification have been assessed with reference to the predicted outcomes and performance criteria specified in the following documents:

- *Port Kembla Outer Harbour Development Environmental Assessment* (EA) prepared by AECOM (March 2010)
- *Port Kembla Outer Harbour Development Revised Submissions Report* prepared by AECOM (27 October 2010) – which includes revised Noise and Air Quality impact assessment reports
- The Project Approval (MP 08_0249) issued for Stage 1 (1A, 1B and 1C) of the Port Kembla Harbour Outer Harbour Development as granted on 3 March 2011 and modified on 8 September 2011.

6.1. Traffic Matters

The proposed receival and stockpiling of fill from Barangaroo South shall not require any transport of material on public roads. Trucks receiving fill from the hopper on the Port Kembla Gateway jetty shall travel via an internal port haulage route south past the Stage 1A Reclamation site direct to the stockpile area. The use of sea transport and internal port access avoids the need for up to 35,000 truck movements that would otherwise be required to deliver this volume of material to the site. The stockpile is also located adjacent to the area that is intended for future use of the material, again obviating the need for truck movements on public roads during later construction works.

Condition C15 of the Project Approval imposes a cap on construction trucks accessing the OHD site of 27 trucks per hour. The cumulative trucking impacts of concurrent works on public roads is expected to be generally between 6 and 9 trucks per hour delivering rock to the eastern stockpile site on Foreshore Road. Note that material deliveries for Stage 1A reclamation works have been completed. Therefore, traffic impacts are predicted to be well below the cap and generally consistent with the terms of the Project Approval.

6.2. Noise

The normal hours permitted for construction activities at the OHD are defined in Condition C3 of the Project Approval as follows:

a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
b) 8:00 am to 1:00 pm on Saturdays; and
c) at no time on Sundays or public holidays.

However, Condition C4.a.permits construction outside of these hours provided that the work causes $L_{Aeq(15min)}$ noise levels that are:

i. no more than 5 dB above rating background level at any residence in accordance with the *Interim Construction Noise Guideline* (DECC, 2009); and
ii. no more than the noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) at other sensitive land uses.

All shipping berths and terminals at Port Kembla, including Port Kembla Gateway, operate on a 24/7 basis to receive and despatch cargo. Round-the-clock unloading of the vessel which is proposed to deliver Barangaroo South fill to Port Kembla is essential to ensure efficient use of the terminal and minimise the risk of demurrage costs. Port Kembla Gateway does not have available space at its terminal to receive and temporarily store the Barangaroo South fill, therefore it is necessary to haul directly from the berth to the OHD stockpile site over a continuous period of 40-60 hours every 4-5 days when the ship is at Port Kembla.

AECOM has undertaken a supplementary noise impact assessment with respect to the impact of night-time haulage and stockpiling activities (Attachment A). Predicted night-time noise levels at potentially affected receivers were well below the noise management level criteria derived from the ICNG for both residential and non-residential premises.

When considering cumulative noise impacts it should be noted that:

- Fill receival and stockpiling is the only OHD activity that will occur at night – there is no additional night-time noise impact to consider
- Stage 1A Reclamation Works shall only occur during standard construction hours as per Condition C3.
- Rock receival and stockpiling hours may occur until 5 pm on Saturdays, but otherwise will conform to standard construction hours.

Therefore, 2 cumulative noise scenarios are described below. In each scenario, cumulative noise levels (L_Σ) have been determined by adding predicted noise contributions for each activity (L_1, L_2... L_N) according to the following formula:

$$L_\Sigma = 10 \cdot \log_{10}\left(10^{\frac{L_1}{10}} + 10^{\frac{L_2}{10}} + \cdots + 10^{\frac{L_n}{10}}\right) \text{ dB}$$

Rating Background Levels have been determined as part of the Noise Impact Assessment included with the EA / Submissions Report.

Scenario 1 – Standard Construction Hours

- Concurrent activities occurring between 7 am and 6 pm are Stage 1A reclamation works, rock receival& stockpiling and fill receival and stockpiling.

- Assume that the noise emitted from rock receival and stockpiling is the same as that for modelled for fill receival and stockpiling (as per AECOM, 2012). A 5 dB penalty has been added to the rock receival and stockpiling emissions to account for tonal reversing alarms. This is considered conservative as the rock receival site is 200 m further away from residential premises than the fill receival site.
- Noise contribution from Stage 1A reclamation works is as per the predicted noise levels for the worst case scenario (AECOM, 2011), including the 5 dB penalty due to use of reversing alarms and a vibratory roller. This is quite conservative as the remaining activity shall involve only 5 items of plant as compared to the 25 items plus 7 trucks modelled in the worst case.
- To overcome the absence of any prediction of noise impact from Stage 1A reclamation at the Foreshore Rd industrial premises, conservatively assume it is that noise levels are the same as for the Old Port Rd offices which are located closer to the site.
- Assume works occurring under neutral meteorological conditions, as the worst case conditions are only applicable at night when temperature inversions typically occur.
- Cumulative noise levels (Table 1) are conservatively predicted to be below relevant criteria at the most affected residential premises and at commercial and industrial premises.

Table 1 Predicted maximum noise levels for standard construction hours activities (Scenario 1)

Receiver	Rating Background Level, L_{A90} Day dB(A)	Noise Management Level, dB(A)	Predicted Noise – Fill, dB(A)	Predicted Noise – Rock, dB(A)	Predicted Noise – Reclamation, dB(A)	Calculated Cumulative Noise, dB(A)
11 Military Rd (SCA1)	47	**57**	40	45	47	**50**
1 Jubilee Rd (SCA2)	39	**49**	36	41	43	**46**
Old Port Rd Offices	-	**70** when in use	52	57	64	**65**
Foreshore Rd Industrial Premises	-	**75** when in use	45	50	64	**64**

Scenario 2 – Saturday afternoons

- Saturday afternoons (after 1 pm) with both fill and rock receival activities occurring simultaneously.
- Assume that the noise emitted from rock receival and stockpiling is the same as that for modelled for fill receival and stockpiling (as per AECOM, 2012). Add a 5 dB penalty to the rock receival and stockpiling emissions to account for reversing alarms. This is considered conservative as the rock receival site is 200 m further away from residential premises than the fill receival site.
- Assume stockpiling under neutral meteorological conditions, as the worst case conditions are only applicable at night when temperature inversions typically occur.
- Cumulative noise levels (Table 2) are conservatively predicted to be below relevant criteria at the most affected residential premises and at commercial and industrial premises.

Table 2 Predicted noise levels for Saturday afternoon activities (Scenario 2)

Receiver	Rating Background Level, L_{A90} Day dB(A)	Noise Management Level, dB(A)	Predicted Noise – Fill, dB(A)	Predicted Noise – rock, dB(A)	Predicted Cumulative Noise
11 Military Rd (SCA1)	47	**52**	40	45	**46**
1 Jubilee Rd (SCA2)	39	**44**	36	41	**42**
Old Port Rd Offices	-	**70** when in use	52	57	**58**
Foreshore Rd Industrial Premises	-	**75** when in use	45	50	**51**

Noise mitigation and management measures proposed for fill receival and stockpiling activities include:

- ensuring that vehicles access the stockpile from the north-western side which faces away from residents;
- use of non-tonal, directional reversing alarms on all plant items;
- limiting the amount of reversing;
- turning off plant when not in use;
- operating and maintaining plant in a proper and efficient manner;
- night-time noise verification monitoring.

In summary, the noise impact of proposed out of hours works and the cumulative impacts of concurrent works are predicted to be well within ICNG criteria and therefore consistent with the terms of the Project Approval. Further details regarding noise management measures for fill receival and stockpiling works shall be provided in the Construction Noise and Vibration Management Plan

6.3. Air Quality

The main air pollutants of interest for OHD construction works are total suspended particulates (TSP) and particulate matter less than 10 microns (PM_{10}). The *Revised Air Quality Impact Assessment (RAQIA)* (AECOM, September 2010) is the key air quality report that was considered in the determination of the OHD Project Approval. The RAQIA describes a project construction air emissions scenario in which material stockpiles, dredging vessels, trains (delivering fill) and trucks are identified as the main sources of TSP and PM_{10} emissions (refer to Table 15 of the RAQIA). Closer examination of the emissions inventory (Appendix A of the RAQIA) reveals the assumptions upon which the emissions scenario is based and provides some further breakdown of emissions with respect to activities. A comparison of predicted emissions (Table 3) between the RAQIA scenario and the proposed concurrent OHD works described in section 3 above has been prepared by scaling the RAQIA emissions data with respect to key variables such as stockpile area, loading rates and truck numbers.

Table 3 Comparison of predicted emissions between the RAQIA and proposed concurrent works

Assumptions	**RAQIA Scenario 1a**		**Proposed concurrent OHD construction works**	
Stockpile area (wind erosion), m^2	15,000		49,000	
Loading rate, t/hr	225		800	
Unloading rate, t/hr	225		0	
No. of trucks	6		12	
Emission sources	**Emission rates, g/s**		**Emission rates, g/s**	
	TSP	**PM_{10}**	**TSP**	**PM_{10}**
Dredging vessel	0.18	0.18	0	0
Trains	0.047	0.047	0	0
Trucks	0.00074	0.00074	0.0015	0.0015
Stockpile (wind erosion)	0.083	0.042	0.27	0.14
Stockpile (loading)	0.38	0.13	1.35	0.46
Stockpile (unloading)	0.94	0.41	0	0
TOTAL	**1.62**	**0.81**	**1.62**	**0.60**

The emissions scenario data presented in Table 3 indicates that the impact of the larger proposed stockpile area and higher loading rate in the proposed concurrent works scenario is offset by the absence of dredging, train deliveries and stockpile unloading activities. Hence, the predicted TSP emissions for both scenarios are equivalent at 1.62 g/s and the PM10 emissions are predicted to be less than the RAQIA scenario.

The predicted emissions from the proposed concurrent works is considered to be conservative for the following reasons:

- wind erosion from the 10,000 m^2 rock stockpile is likely to be much less than predicted due the coarse nature of the material;
- stockpile loading emissions for Barangaroo South fill are likely to be less than predicted due to the expected moisture content (10-15%) of the material; and
- upon completion, the stockpile surface will be covered with either grass cover or an artificial seal to minimise wind erosion.

Air quality monitoring undertaken during the course of Stage 1A reclamation works has confirmed the validity of the RAQIA predictions with PM_{10} concentrations demonstrating consistent compliance the 24hr average criteria of 50 $\mu g/m^3$.

Air quality management measures to be implemented for fill receival and stockpiling activities include:

- use of water carts and/or sprinklers to suppress dust;
- installation of a shaker grid to prevent drag out of dust from the OHD site onto the Port Kembla Gateway paved area;
- speed limit of 40 km/h for all vehicles on site;
- hydromulching of the stockpile surface to establish a stabilising grass cover or other type of sealing; and

- real time dust monitoring during material haulage and stockpile construction activities with automated alarms when trigger levels are exceeded.

The emissions predictions and monitoring data presented above indicate that the air quality impact of the proposed works is likely to be consistent with the assessment on which the Project Approval was based.

6.4. Water Quality

The site on which rock from West Keira is stockpiled gently slopes northwards towards the Outer Harbour. The stockpiled rock has minor potential for water erosion and sediment pollution of runoff waters due to the predominantly coarse nature of the rock material. The material is inert VENM and therefore not likely to generate contaminated leachate. Water quality values are protected at the site through the installation and maintenance of appropriate erosion and sediment control measures described within the CEMP.

The proposed location of the stockpile for Barangaroo South fill material drains via two shallow depressions towards the Outer Harbour. The stockpiled fill has potential for water erosion and sediment pollution of runoff waters. Intensive testing at Barangaroo South has demonstrated that the potential for leaching of contaminants from the fill material is very low. Erosion and sediment control measures, including sediment basins, shall be implemented and maintained for the duration of the fill stockpile to protect water quality. The working surface of the stockpile shall be progressively graded and compacted after each shipment to minimise infiltration and direct runoff via lined channels towards the basins. The basins shall be of a modified dry rock design, incorporating a core of blast furnace slag material whose alkalinity shall assist in immobilising any metal contaminants in the unlikely event that leaching occurs. Further detail regarding water quality management and monitoring will be included in the CEMP. Contingency plans for the possibility of encountering contamination, potential or actual acid sulfate soils and fuel or chemical spills shall also be addressed in the CEMP.

6.5. Visual Amenity

The OHD site is situated within a precinct of heavy industry and port-related development. The visual environment of the area is characterised by large sheds, chimney stacks, bulk liquid tanks, jetties, cranes and large areas of bare ground. The footprint of the proposed fill stockpile is similar to that proposed in the EA. The proposed increase in the volume of fill to be stored (i.e. up to 300,000 m^3) necessitates a stockpile height of up to 11 m. While the bulk and form of the stockpile shall be noticeable to persons accessing the Outer Harbour, it is in keeping with numerous other structures in the vicinity (refer to attached photos). It should also be noted that there is a significant “buffer” of industrial and commercial development between the Outer Harbour and neighbouring residential areas such that very few, if any, residents are likely to have a view of the proposed stockpile. The Port of Port Kembla and surrounds has several large stockpiles of dry bulk materials. For example coal stockpiles at the Coal Terminal are over 20m in height.

The Landscape and Visual Amenity Assessment at Appendix L of the EA (AECOM, 2010) describes the impact of construction and operational activities, including stockpiles on visual amenity. The port/industrial context and potential screening offered by adjacent buildings and structures is

acknowledged in the assessment as reasons why the development is likely to have a “low visual impact” on viewers in the adjacent area.

Photos of Structures on Land Adjacent to Outer Harbour Development Site

Photo 1. Morgan Cement clinker receival area, Foreshore Rd

Photo 2. Austral Masonry blockworks (foreground) and Incitec Pivot fertiliser shed (background), Foreshore Rd

Photo 3. Austral Masonry storage shed, Foreshore Rd

Photo 4. Orica acid plant, Foreshore Rd

Photo 5. Downer EDI maintenance shed, Old Port Rd

Photo 6. Murrell's freight storage shed, Old Port Rd

Photo 6. BlueScope Steel CRM Works, Old Port Rd

Photo 7. Scrap metal yard, Old Port Rd

Attachment 1 Noise Impact Assessment – Out of Hours Work

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9 August 2012

Trevor Brown
Port Kembla Port Corporation
Maritime Centre
91 Foreshore Road
Port Kembla NSW 2505

Dear Trevor

Port Kembla Outer Harbour - Out of Hours Works - Noise Impact Assessment

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) has been commissioned by Port Kembla Port Corporation (PKPC) to provide a construction noise impact assessment (CNIA) for proposed out of hours works at Port Kembla Outer Harbour. This letter is issued as an addendum to the previous AECOM report Port Kembla Outer Harbour – Construction Stage 1A – Noise Impact Assessment (ref: 60211984 dated 19 May 2011).

2.0 Site location and noise sensitive receivers

The location of the outer harbour construction area and the worst affected receivers is shown on Figure 1.

Figure 1 Site location and worst affected receivers

3.0 Construction noise management levels

The construction noise management levels have been derived in AECOM report 60211984.RPT01.01 dated 19 May 2011 in accordance with the Environmental Protection Authority's (EPA) Interim Construction Noise Guideline (ICNG). The resulting management levels for residential receivers are reproduced below in Table 1.

Table 1 – Construction noise management levels – Residential receivers

Receivers	Rating Background Level, Day dB(A)	Daytime Noise Management Levels L_{Aeq} dB(A)	Rating Background Level, Night dB(A)	Night time Noise Management Limit L_{Aeq} dB(A)
SCA1	47	**57**	45	**50**
SCA2	39	**49**	37	**42**

Sensitive land use and other non-residential receiver noise management levels are reproduced in Table 2.

Table 2 – Construction noise management levels – Sensitive land uses other than residential

Land Use	Management Level, L_{Aeq} (15 min) (applies when properties are in use)
Classrooms at schools and other educational institutions	Internal noise level 45 dB(A)
Hospital wards and operating theatres	Internal noise level 45 dB(A)
Places of worship	Internal noise level 45 dB(A)
Active recreation areas (characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion)	External noise level 65 dB(A)
Passive recreation areas(characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example, reading, meditation)	External noise level 60 dB(A)
Community centres	Depends on the intended use of the centre. Refer to the recommended 'maximum' internal levels in AS 2107 for specific uses.
Industrial premises	External $L_{Aeq\ (15min)}$ 75 dB(A
Commercial receivers – offices, retail outlets	External $L_{Aeq\ (15min)}$ 70 dB(A)

3.1 Sleep disturbance

The *ICNG* requires a sleep disturbance analysis where construction works are planned to extend over more than two consecutive nights. The Environment Protection Authority (EPA) approach is to apply an initial screening criterion of background plus 15 dB(A) and to undertake further analysis when the screening criterion is exceeded.

The ICNG recommends reference to the NSW Environmental Criteria for Road Traffic Noise (EPA 1999) (ECRTN) for some guidance in assessing the potential for sleep disturbance.

The ECRTN contains an assessment of sleep disturbance which represents NSW EPA advice on the subject of sleep disturbance due to noise events. Section B5 of Appendix B concludes, having considered the results of four research papers by *Pearson et al (1995)*, *Bullen et al (1996)*, *Griefahn (1992)* and *Finegold et al (1994)* with the statement, *'Maximum internal noise levels below 50-55 dB(A) are unlikely to cause awakening reactions'*. Therefore, given that an open window provides 10 dB(A) noise attenuation from outside to inside, external noise levels of 60-65 dB(A) are unlikely to result in awakening reactions.

Derivation of the sleep disturbance criteria is presented in Table 3.

Table 3 Sleep disturbance criteria

Receivers	Rating Background Level, Day dB(A)	Sleep disturbance screening criterion (RBL+15)	Sleep disturbance criterion
NCA1	45	60	60
NCA2	37	52	60

4.0 Construction noise assessment

4.1 Methodology

The noise impact as a result of out of ours work activities have been modelled in SoundPLAN v 7.0 using an implementation of the CONCAWE algorithms, which is considered appropriate for this scenario.

Details of the plant sound power levels are shown in Table 4. All plant operations have been modelled as moving point sources. Source have been modelled at 3 m above ground height, an additional 10 m has been added in the stockpiling as stocks are raised. Meteorological conditions have been modelled as both neutral and worst case scenario. Worst case scenario has been assumed as a 3 m/s source to receiver wind of an F class temperature inversion.

The assessment assumes that all plant will be fitted with non-tonal, directional reversing alarms, as advised by PKPC.

Table 4 Stage 1A construction plant – modelling details

Plant	Number of equipment	% of time in operation	Sound power levels for individual equipment dB(A)
Semitrailer	10	100	108
Caterpillar D8 Dozer	1	50	107
Caterpillar 12G Grader	1	50	110
Water Cart	1	50	103
24 Tonne Excavator	1	50	101

4.2 Results

The results of the modelling are presented in Table 5. Results are also presented graphically in noise contours attached to this letter.

Table 5 Modelling results

Receiver Location	Predicted $L_{Aeq(15min)}$ noise level dB(A)	Noise Management Level dB(A)	Predicted exceedance dB
Neutral meteorological conditions			
11 Military Road – SCA 1	40	50	-
1 Jubilee Road – SCA 2	36	42	-
Old Port Road Offices	52	70 when in use	-
Foreshore Road industrial premises	45	75 when in use	-
Worst case meteorological conditions			
11 Military Road – SCA 1	42	50	-
1 Jubilee Road – SCA 2	39	42	-
Old Port Road Offices	52	70 when in use	-
Foreshore Road industrial premises	46	75 when in use	-

The results of the assessment show compliance with the noise management level at all identified receivers

The results of the sleep disturbance assessment are presented in Table 6.

Table 6 Sleep disturbance assessment results

Receiver Location	Predicted L_{Amax} noise level dB(A)	Sleep disturbance screening criterion (RBL+15)	Predicted exceedance dB
Neutral meteorological conditions			
11 Military Road – SCA 1	40	60	-
1 Jubilee Road – SCA 2	36	52	-
Old Port Road Offices	52	N/A[1]	N/A[1]
Foreshore Road industrial premises	45	N/A[1]	N/A[1]
Worst case meteorological conditions			
11 Military Road – SCA 1	42	60	-
1 Jubilee Road – SCA 2	39	52	-
Old Port Road Offices	52	N/A[1]	N/A[1]
Foreshore Road industrial premises	46	N/A[1]	N/A[1]

Notes:

1) Sleep disturbance is only applicable to residential receivers.

The results of the assessment show that none of the identified receiver exceeds the sleep disturbance screening criterion, therefore further assessment is not required.

5.0 Conclusion

The noise impact resulting from activity associated with out of hours construction at Port Kembla Outer Harbour has been assessed at potentially affected noise sensitive receivers.

This letter is an addendum to the previous AECOM report 60211984.RPT01.01 dated 19 May 2011.

The noise impact at nearby residential and commercial receivers is predicted comply with night time construction noise management levels during the worst case construction scenario and during worst case meteorological conditions.

A sleep disturbance assessment has been undertaken and results show that none of the identified receiver exceeds the sleep disturbance screening criterion; therefore further assessment is not required.

The noise impact from the proposed work will not be significant on the local community.

Yours sincerely

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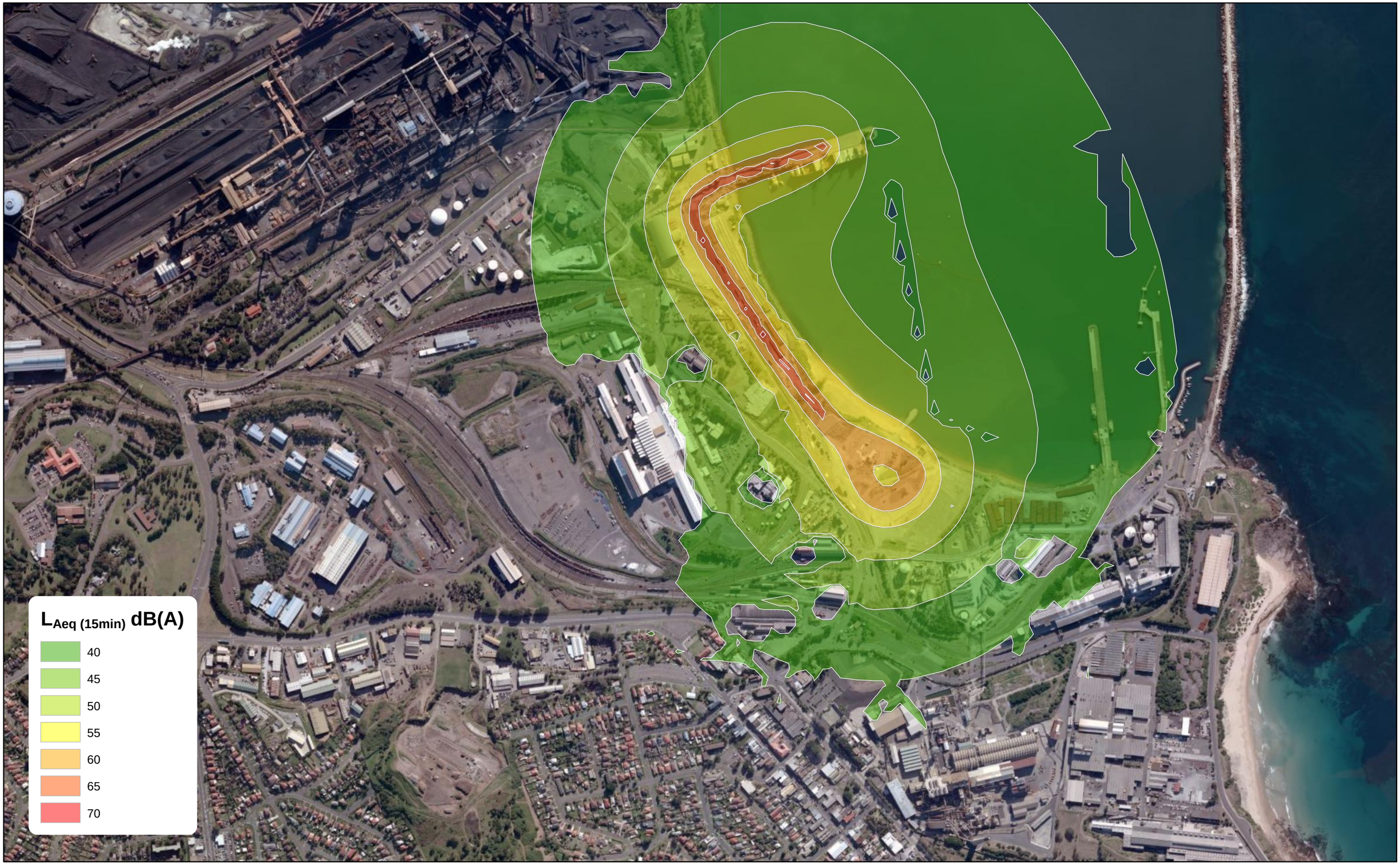
cc: Sean Holmes (AECOM)

AECOM



Port Kembla Outer Harbour Works

Out of Hours Work - Noise Contours - Neutral Conditions

Source:

0 50 100 200 300 400 m

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Fig. **1**

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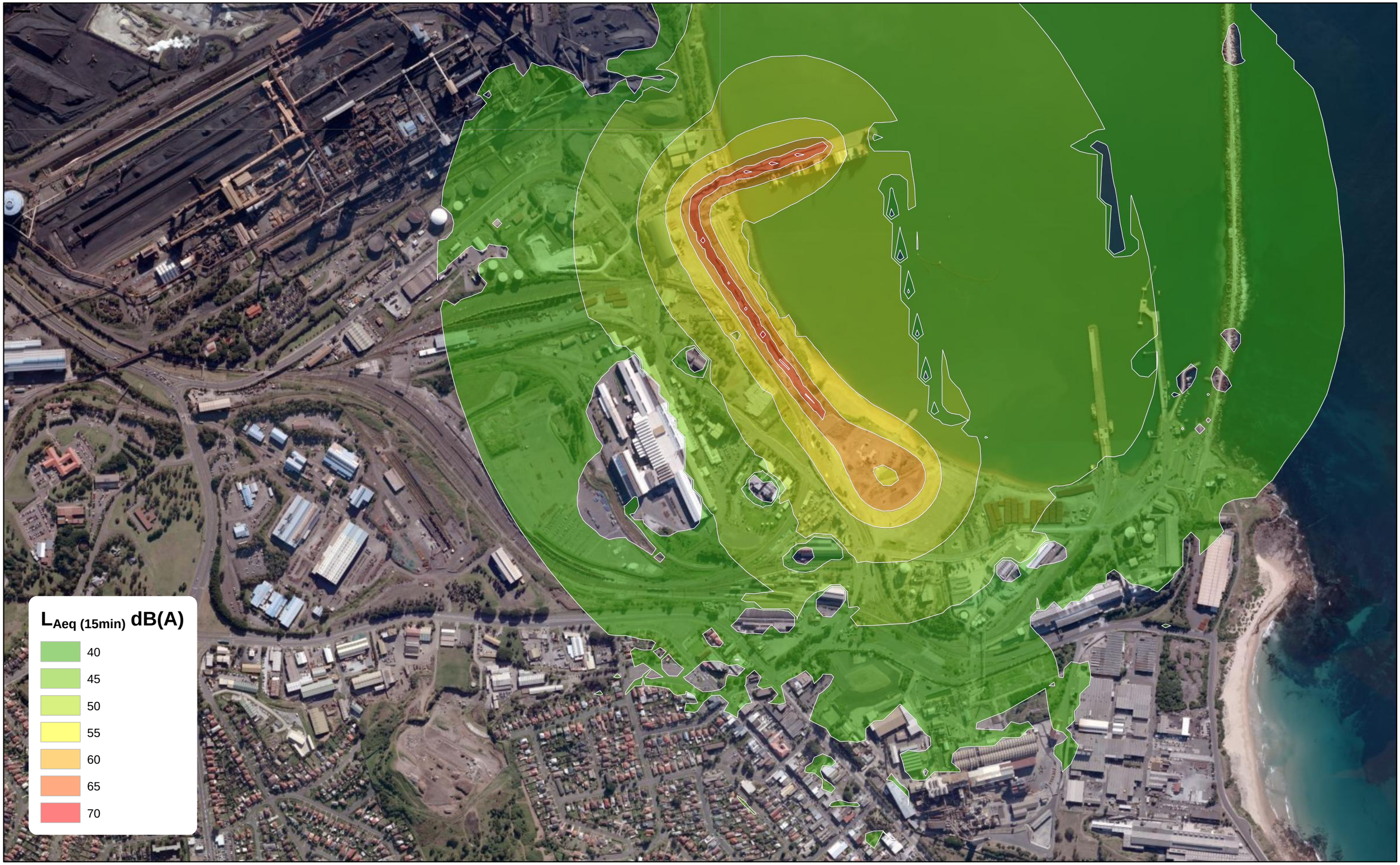

Port Kembla Outer Harbour Works

Out of Hours Work - Noise Contours - Worst Case Meteorological Conditions

Source:

0 50 100 200 300 400 m

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Fig **2**