

**REVIEW OF AIR QUALITY IMPACT ASSESSMENTS  
GLEBE ISLAND PORT  
CONCRETE BATCHING PLANT &  
GLEBE ISLAND MULTI-USER FACILITY  
GLEBE ISLAND NSW**

**Prepared for:** EDO NSW on behalf of Jacksons Landing Coalition

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**Prepared by:** Nicolas Israel, Director

**Reviewed by:** Kieran Horkan – Scientific Director

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We Speak your Environmental Language*

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National Integrated Creative Solutions  
P O Box 150  
Seven Hills NSW 1730 AUSTRALIA  
Email: 20nicolas15@gmail.com

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## DOCUMENT CONTROL

**Prepared by:** Nicolas Israel      **Position:** Director      **Date:** 30 August 2018

**Reviewed by:** Kieran Horkan      **Position:** Scientific Director      **Date:** 30 August 2018

**Approved by:** Nicolas Israel      **Position:** Director      **Date:** 30 August 2018

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## ABBREVIATIONS

<b>AHD</b>	Australian Height Datum
<b>ANZECC</b>	Australian & New Zealand Environment & Conservation Council
<b>Appropriate Regulatory Authority (ARA)</b>	Generally, the appropriate regulatory authority is the EPA for licensed premises and local Council for non-licensed premises. There are exceptions to this definition as stated in Clause 6 of the POEO Act.
<b>AS</b>	Australian Standard
<b>AWS</b>	Automatic Weather Station
<b>BPEMG</b>	Best Practice Environmental Management Guideline
<b>CO</b>	carbon monoxide
<b>CO<sub>2</sub>-e</b>	carbon dioxide equivalent
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>DA</b>	Development Application
<b>DEC</b>	NSW Department of Environment and Conservation
<b>DECC</b>	NSW Department of Environment, Climate Change and Water
<b>DoPE</b>	NSW Department of Planning and Environment
<b>DoPI</b>	NSW Department of Planning & Infrastructure
<b>EDO NSW</b>	Environmental Defenders Office of NSW
<b>EP&amp;A Act</b>	NSW Environmental Planning and Assessment Act 1979
<b>EPA</b>	NSW Environment Protection Authority
<b>EPL</b>	Environment Protection Licence
<b>g</b>	grams
<b>ha</b>	hectares
<b>HVAS</b>	high volume air samplers
<b>km</b>	kilometre
<b>LGA</b>	Local government area
<b>m</b>	metre
<b>m<sup>2</sup></b>	metre squared
<b>µg/m<sup>3</sup></b>	micrograms per cubic metre
<b>Mtpa</b>	million tonnes per annum
<b>NEPC</b>	National Environment Pollution Committee
<b>NEPM</b>	National Environment Pollution Measure
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NO<sub>x</sub></b>	Oxides of Nitrogen
<b>NPWS</b>	National Parks and Wildlife Service
<b>OEH</b>	NSW Office of Environment and Heritage
<b>PAC</b>	NSW Planning Assessment Commission
<b>PM<sub>10</sub></b>	Particulate matters which are 10 micrometres or less in diameter
<b>PM<sub>2.5</sub></b>	Particulates matters which are 2.5 micrometres or less in diameter
<b>POEO Act</b>	NSW Protection of the Environment Operations Act 1997
<b>RMS</b>	Roads & Maritime Services
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>SSVA</b>	Site-specific visual assessment
<b>t</b>	tonne
<b>TSP</b>	total suspended particulates

# 1. INTRODUCTION

National Integrated Creative Solutions (NICS) was commissioned by the Environmental Defenders Office NSW (ABN 72 002 880 864) (EDO NSW) to review the Air Quality Impact Assessments associated with two proposed developments within the Glebe Island Precinct. The first development is a Concrete Batching Plant to be located within the Glebe Island Port and the second is a Multi-User Facility to be located within Port Authority land on Glebe Island.

Hanson Construction Materials Pty Ltd (Hanson) engaged the services of Pacific Environment Pty Ltd (Pacific Environment) to undertake an air quality and greenhouse gas assessments for the proposed construction and operation of a Concrete Batching Plant (CBP) at Glebe Island, within the Bays Precinct, NSW.

The Multi-User Facility activities include the importation, storage and distribution of bulk construction materials such as sand, cement and aggregates which will be delivered to the facility by ship. A review of Environmental Factors (REF) was prepared by AECOM Australia Pty Ltd (AECOM) to address the potential environmental impacts on the surrounding environment as a result of undertaking the proposed activities by the Port Authority (proponent).

This report was prepared based on the documents listed below and for completeness it is suggested that this report be read in conjunction with these documents and their updates/addendums.

- 1 Glebe Island Port – Hanson Glebe Island Concrete Batching Plant Air Quality Assessment – Pacific Environment Pty Ltd - 15 March 2018
- 2 Glebe Island Multi-User Facility Review of Environmental Factors – AECOM Australia Pty Ltd – 24 January 2018

## 1.1 OBJECTIVES

The main objective of this report is to determine whether the Air Quality Impact Assessments provided by the proponents has adequately assessed the potential air emission impacts from the proposed activities on the surrounding environment in accordance with current NSW relevant legislation, policies and guidelines.

Additional generic objectives are:

- ❖ To determine whether the methodology used is consistent with the current methods approved by the NSW EPA,
- ❖ To determine whether the results provided by the proponents have been correctly interpreted and reflected in the Air Quality Impact Assessments, and
- ❖ To determine whether the results of the Air Quality Impact Assessments demonstrate compliance with the NSW adopted air quality criteria for Particulate Matters with a diameter of 10 µm or less (PM<sub>10</sub>), Particulate Matters with a diameter of 2.5 µm or less (PM<sub>2.5</sub>), Total Suspended Particulates (TSP) and Deposited Dust, and
- ❖ To determine whether the assessment has taken into consideration the cumulative impact from all present and proposed activities including their own.

Notwithstanding the above general objectives of such a review, the following specific objectives have been requested by the EDO NSW for both assessments.

- a) *In your opinion, are the air quality assessments undertaken for the Projects adequate? In particular, have the cumulative air quality impacts, including ship emissions, been properly considered? Please provide reasoning for your answer.*
- b) *In your opinion, are the predictions of air quality impacts on neighbouring residents reasonable and appropriate?*
- c) *In your opinion, are any proposed avoidance and mitigation measures for minimising impacts appropriate?*
- d) *Please provide a basic, plain English explanation of the likely air quality impacts on adjoining residents (within approximately 300m of the facilities and ship berths), having regard to the cumulative effects of both facilities and associated shipping.*
- e) *Provide any further observations or opinions which you consider to be relevant.*

## 1.2 REFERENCE GUIDELINES AND PUBLICATIONS

During the review, the following documents were used as reference materials since these documents were either published or adopted by the EPA and they are the most relevant publications for this review:

- ❖ NSW Environment Protection Authority, “*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*”, January 2017;
- ❖ NSW Environment Protection Authority, “*Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*”, January 2007;
- ❖ NEPC (1998), “Ambient Air – National Environment Protection Measures for Ambient Air Quality” National Environment Protection Council, Canberra;
- ❖ NEPC (2003), “Variation to the National Environment Protection (Ambient Quality) Measure for Particles as PM<sub>2.5</sub>”, May 2003;
- ❖ US EPA (1995), “Compilation of Air Pollutant Emission Factors”. AP-42, Fourth Edition United States Environmental Protection Agency, Office of Air and Radiation Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711. Note this reference is now a web-based document.
- ❖ National Pollutant Inventory Emission Estimation Technique Manual (NPI EETM) for Mining (2012);
- ❖ National Pollutant Inventory Emission Estimation Technique Manual (NPI EETM) for Mining and Processing of Non-Metallic Materials (2014); and
- ❖ National Pollutant Inventory Emission Estimation Technique Manual (NPI EETM) for Concrete Batching and Concrete Product Manufacturing (1999).

Due to the fact that we are undertaking a review of two (2) separate proposals and the cumulative impacts from these two (2) proposals as well as existing and other proposed activities, it is



considered appropriate that we provide the information in two (2) separate Sections below. Other Sections of this document present the cumulative impacts from both proposals as well as existing and other proposed activities.

## PROPOSAL A – CONCRETE BATCHING PLANT

### The Proposal

Despite the fact that detailed information about the proposal, environmental assessments and other processes undertaken so far is beyond the scope of this report, it was considered appropriate to include a brief description of the proposal in this Section.

Based on the documents associated with proposal A, Hanson propose to develop a new intermodal aggregate storage facility and concrete batching plant to be located adjacent to Glebe Island Berth One (GLB1) (Lot 10 in DP 1170710) (the Site), as shown in Figure 2-1. The plant will be designed with a capacity to produce up to 1 million cubic metres of concrete per annum and will supply aggregate to other Hanson sites in the vicinity. The proposed plant will serve two purposes:

- ❖ To act as a shipping facility that will support a number of Hanson (and Hymix) concrete batching plants by improving the delivery of aggregates into the city centre; and
- ❖ To operate as a concrete batching plant that can supply concrete for infrastructure and buildings in the CBD and inner suburbs.

The concrete batching plant will be supported by new aggregate shipping terminal facilities at GLB1 with the capacity to manage up to 1 million cubic metres of concrete aggregates per annum delivered by ship from the Hanson Bass Point Quarry and other facilities if deemed viable.

By facilitating delivery by ship, the proposed development intends to reduce the number of trucks required to haul aggregates into Sydney on the regional road network by up to 65,000 trips per annum.

The concrete batching plant is proposed to operate 24 hours per day seven days per week.

Based on the AQIA, this development is likely to generate up to 689 trucks per normal operational day or 1,378 truck movements (incoming and outgoing) every 24 hours. However, based on table 6-2 of the AQIA, a total of 7,576 trucks per day will be required for a peak operational day. This means that the daily truck movements (incoming and outgoing) for a peak operational day will be up to 15,152.

To give the reader a better understanding of the location of the site, it was considered appropriate to include **Figure A1** which shows the site in the local context and **Figure A2** which shows the site in the regional context. **Figure A3** shows the potentially sensitive receptors as defined in the EPA's approved methods, in relation to the proposed location of the concrete batching plant (Courtesy of Pacific Environment AQIA report). **Figure A4** shows the proposed site layout for the concrete batching plant (Courtesy of Pacific Environment AQIA report).

**Figure A1: Site Location in the Local Context – Concrete Batching Plant**



**Concrete  
Batching Plant**



Figure A2: Site Location in the Regional Context

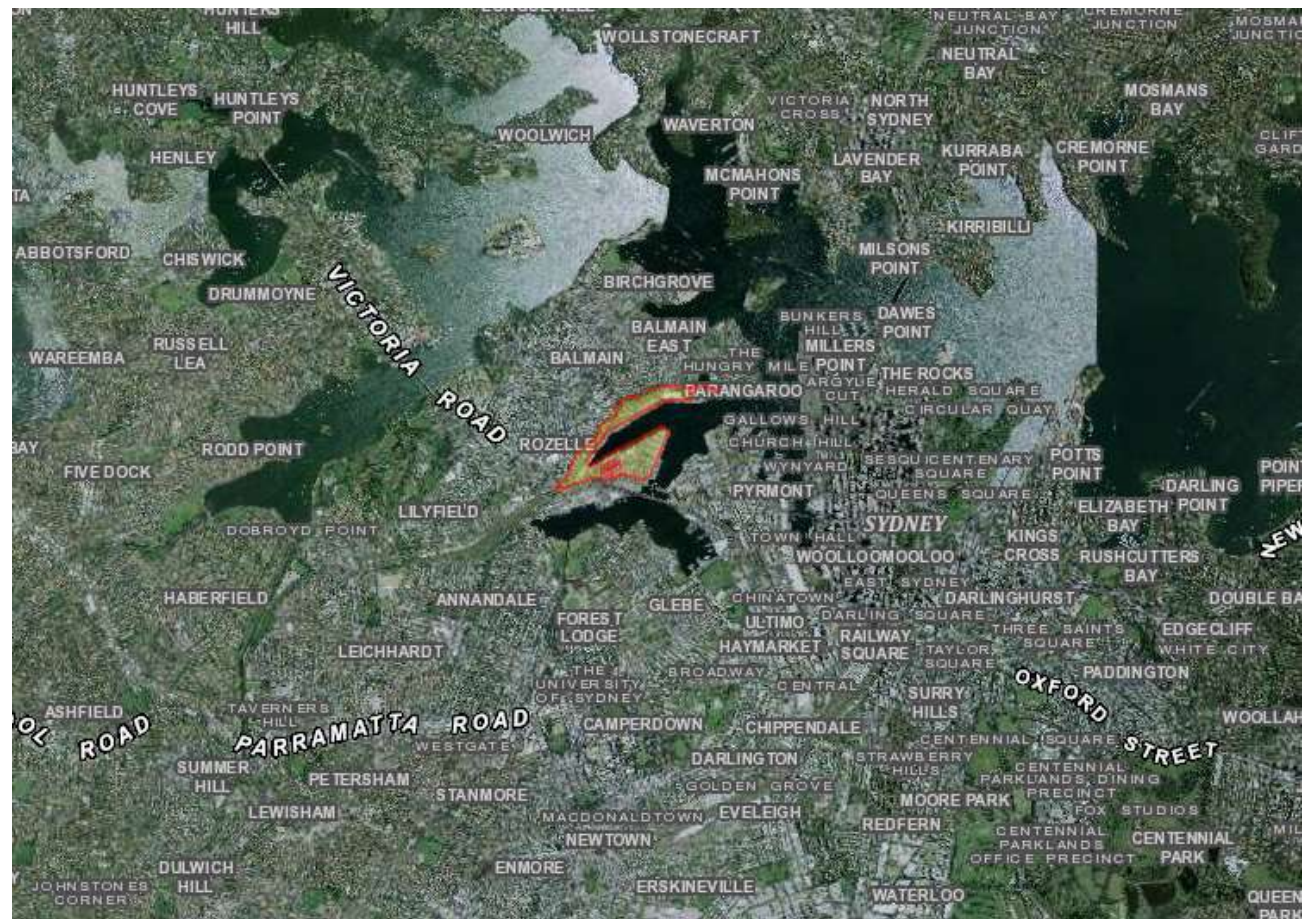


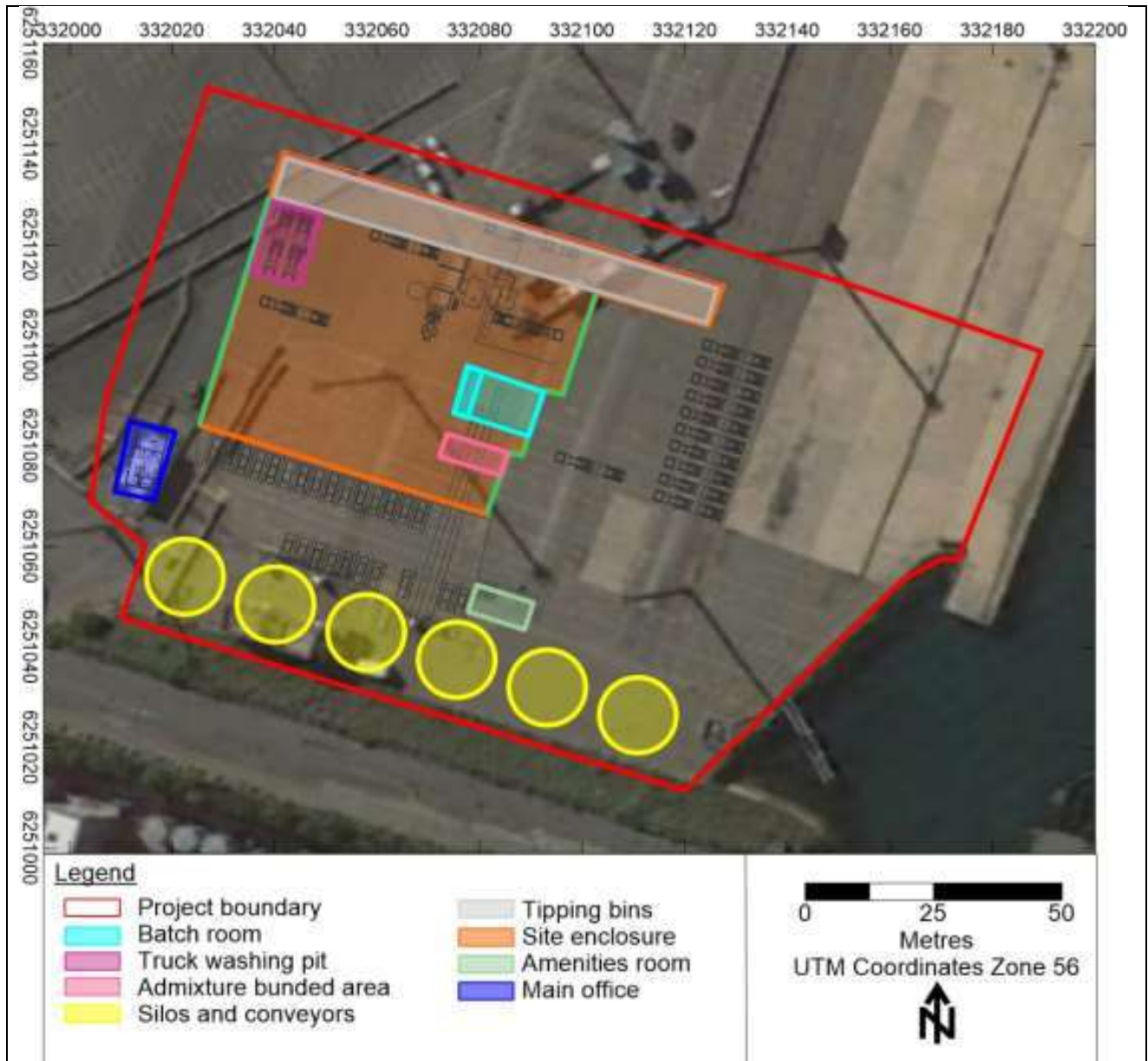
Figure A3: Potentially Sensitive Receptors in the Vicinity of the Concrete Batching Plant



Concrete Batching  
Plant



Figure A4: Concrete Batching Plant Site Layout



## 2. INDEPENDENT PEER REVIEW FOR THE CONCRETE BATCHING PLANT

A comprehensive review has been conducted in accordance with the EDO NSW request outlined in recent communications between EDO NSW and NICS. The requested review is to focus on the “**Air Quality Impact Assessment**” prepared by Pacific Environment Pty Ltd (Pacific Environment) and dated 15 March 2018.

The review was focussed on several aspects including the following:

- Modelling Approach/Methodology,
- Interpretation of Modelling Results,
- Comparison of Results with EPA Criteria, and
- Adequacy of the Cumulative Impacts Assessment.

The independent peer review for each proposal is divided into two main Sections; **General Comments** and **Specific Comments**.

### 2.1 GENERAL COMMENTS

The general comments included in this Section mainly apply to the overall Air Quality Impact Assessment (AQIA) undertaken as part of the preparation of the EIS for the proposal.

The Air Quality Impact Assessment methodology includes five (5) main stages as outlined below,

- 1 Input data collection;
- 2 Dispersion modelling;
- 3 Processing dispersion model output data;
- 4 Interpretation of dispersion modelling results; and
- 5 Preparation of an impact assessment report.

#### 2.1.1 Input Data Collection

Based on the EPA’s “*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*” AMMAAP, *the first stage in the impact assessment is the collection of all the information required to complete the dispersion modelling. This includes development of an air emissions inventory; compilation of meteorological data; background air quality data; and terrain data.*

In my opinion the AQIA prepared for this proposal has complied comprehensively with this stage of the assessment.

#### 2.1.2 Dispersion Modelling

Due to the complexity of air emission sources within the proposed site and the different sections of the activities, it was determined that a Level 2 AQIA would be appropriate.

The modelling approach used is the appropriate one based on the EPA's current guidelines and most of the recent modelling approaches used for similar proposals.

Despite the fact that the computer model AERMOD which was used for this assessment is not officially approved by the EPA, it is certainly accepted by the EPA as it is much more comprehensive and provides more accurate predictions than the older computer model AUSPLUME.

AERMOD has been used by hundreds of environmental consultants for air quality impact assessments across Australia including NSW on numerous projects. Provided that the EPA's guidelines are adhered to by the modeller, EPA, and other State as well as local Government Authorities have been accepting the use of AERMOD.

### 2.1.3 Processing Dispersion Model Output Data

*“Stage 3 of the assessment process is the prediction ground level concentrations (glcs) of pollutants in the region surrounding the premises. The predicted glcs of all pollutants must be in the same units and for the same averaging period as the relevant impact assessment criteria.”*

For this proposal, the predicted ground level concentrations complied with the above in relation to the unit of measurements and averaging periods.

### 2.1.4 Interpretation of Dispersion Modelling Results

The EPA's Approved Methods have clear guidance information for the Interpretation of dispersion modelling results. Below are excerpts from these methods.

*“Stage 4 of the impact assessment is the interpretation of the dispersion modelling results. The predicted glcs are compared with the EPA's impact assessment criteria and compliance indicates the proposal is unlikely to result in adverse air quality impacts.”*

**Table A1** below includes the limits relevant to the proposed operations as extracted from the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2017)

<b>Table A1: Relevant Limits from the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2016)</b>			
Pollutant	Averaging Period	Concentration	Source
		$\mu\text{g}/\text{m}^3$	
PM <sub>10</sub>	24 hours	50	DoE (2016)
	Annual	25	DoE (2016)
PM <sub>2.5</sub>	24 hours	25	DoE (2016)
	Annual	8	DoE (2016)
Nitrogen dioxide (NO <sub>2</sub> )	1-hour	246	NEPC (1998)
	Annual	62	NEPC (1998)



**Table A1: Relevant Limits from the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2016)**

Pollutant	Averaging Period	Concentration		Source
		µg/m <sup>3</sup>		
Sulfur dioxide (SO <sub>2</sub> )	10-minute	712		NHMRC (1996)
	1-hour	570		NEPC (1998)
	24-hour	228		NEPC (1998)
	Annual	60		NEPC (1998)
Total Suspended Particulates (TSP)	Annual	90		NHMRC (1996)
		g/m <sup>2</sup> /month <sup>a</sup>	g/m <sup>2</sup> /month <sup>b</sup>	
Deposited Dust	Annual	2	4	NERDDC (1988)

a Maximum increase in deposited dust level.

b Maximum total deposited dust level

Based on the results presented in tables 8-1 and 8-2 for the incremental and cumulative glcs respectively for a normal operational day, the air emissions from the proposal complies with EPA's criteria at all receptors.

Based on the results presented in tables 8-3 and 8-4 for the incremental and cumulative glcs respectively for a peak operational day and if we assume that these values are correct, the air emissions from the proposal complies with EPA's criteria at all receptors. **However**, it appears that the results for NOx are inconsistent with the results and the adopted background levels for NOx as presented in Table 5-6 of the AQIA. The cumulative values cannot be lower than the incremental values and certainly cannot be lower than the adopted background values presented in Table 5-6. Therefore, we are uncertain whether for a peak operational day the NOx emissions from the proposed development comply with the EPA's criteria as depicted in **Table A1** above.

### 2.1.5 Preparation of an impact assessment report

*“Stage 5 of the impact assessment is the preparation of a report. The air quality impact assessment report must be prepared in accordance with the requirements specified in Section 9 of the Approved Methods.”*

The AQIA report for this proposal complies with the EPA's requirements.

## 2.2 SPECIFIC COMMENTS

The Specific Comments will focus on the specific objectives requested by the EDO NSW as outlined below.

*a) Are the air quality assessments undertaken for the Projects adequate? In particular, have the cumulative air quality impacts, including ship emissions, been properly considered?*

For the construction stage of the proposal, only qualitative rather than quantitative methodology was used to determine the extent of air emissions impact on sensitive receivers. This methodology could be subject to the individual's interpretation, judgement and discretion rather than being based on more robust scientific, technical and mathematical arguments. However, this methodology has been widely used in the United Kingdom and Australia by Environmental Consultants and appears to be acceptable to NSW Government Authorities despite the fact that there is no formal or official endorsement of this methodology.

For the operation stage of the proposal, the Air Quality Impact Assessment undertaken by the consultant is adequate.

The cumulative air quality impacts including existing background air quality levels as well as air emissions from the ships have been adequately addressed. However, the cumulative air quality impact assessment did not take into consideration proposed activities in the vicinity of the site, in particular the adjacent Multi-User Facility which is likely to have a significant contribution to the existing air quality background levels. Other proposed activities that are likely to generate air emissions include the M4-M5 Link which includes extensive demolition and construction works associated with the Rozelle Interchange. Having reviewed the results of certain pollutants at certain receptors, the cumulative background level concentrations are at or marginally lower than the EPA's criteria. For example, annual PM<sub>2.5</sub> air quality background level was considered to be 7µg/m<sup>3</sup> at all receptors. The EPA's annual PM<sub>2.5</sub> criterion is 8µg/m<sup>3</sup>. This means that annual PM<sub>2.5</sub> air emissions from all activities together rather than individually should be less than 1 µg/m<sup>3</sup>. For receptor R4, the cumulative annual PM<sub>2.5</sub> is 8.0µg/m<sup>3</sup>, for receptor R7 is 7.8µg/m<sup>3</sup> and for receptor R8 is 7.7µg/m<sup>3</sup>. As stated above these values do not include the cumulative impact from all existing and proposed activities which are likely to emit annual PM<sub>2.5</sub> greater than 1µg/m<sup>3</sup> when considering the proposed activities.

*b) Are the predictions of air quality impacts on neighbouring residents reasonable and appropriate?*

As stated above, for the construction stage of the proposal, only qualitative rather than quantitative methodology was used to determine the extent of air emissions impact on sensitive receivers. It is very difficult to determine the extent of impact on neighbouring residents based on a qualitative rather than quantitative assessment. However, the results of this assessment demonstrated that the impact is likely to be low.

For the operational stage of the proposal, the predicted ground level concentrations are reasonable and appropriate since they were undertaken in accordance with current NSW EPA published and/or adopted guidelines.

*c) Are any proposed avoidance and mitigation measures for minimising impacts appropriate?*

For the construction stage, the AQIA has recommended several management and mitigation measures to be implemented on site to ensure that the activities are undertaken in an environmentally friendly manner and to reduce the potential for air emissions as a result of the construction activities. These mitigation measures are appropriate for most construction sites and certainly for the construction stage of this proposal.

For the operation stage of the proposal, the AQIA has recommended several management and mitigation measures to be implemented on site to ensure that the activities will comply and continue to comply with the EPA's criteria as demonstrated in the assessment for the life of the development.

It is advisable that more site specific rather than generic mitigation measures and amelioration strategies should be developed for both construction and operation stages of the development.

*d) Explanation of the likely air quality impacts on adjoining residents (within approximately 300m of the facilities and ship berths), having regard to the cumulative effects of both facilities and associated shipping*

Response to this request is provided at the Findings and Conclusions Section of this document.

*e) Provide any further observations or opinions which you consider to be relevant*

Response to this request is provided at the Findings and Conclusions Section of this document.

## PROPOSAL B – MULTI-USER FACILITY

### The Proposal

The Project is proposed to include construction and operation of a ship off-loading, storage and despatch facility for bulk construction materials such as sand, aggregates and other dry bulk construction materials.

The Project site is located within Lot 10 on DP1170710 (owned by the Port Authority) at Glebe Island Berths 1 and 2 on the eastern side of Glebe Island, in Sydney Harbour. The Project would include the following key features:

- An enclosed bulk material storage building consisting of storage bays designed to allow products to be conveyor fed through the building's wall/roof slot(s). The building slot(s) would be closed at times when material is not being unloaded from ships. The total storage capacity of the storage structure would be approximately 70,000m<sup>3</sup> distributed in stockpiles over the bays (e.g. 14,000m<sup>3</sup> per bay if it was operated in a five bay arrangement).
- Electric radial stackers on the wharf edge, with a maximum of two stackers operating at any one time. The stackers would deliver bulk materials directly into the individual storage bays through the building slot(s). Bulk material would be fed into the radial stacker/s from moored ships.
- Truck-loading located internally to the storage building allowing multiple trucks to be loaded. Truck loading would involve the use of front end loaders. The building and internal operations would be designed to minimise dust and noise emissions.
- A weighbridge located next to the storage building to ensure truck and dogs are loaded to acceptable limits.
- Demountable offices and amenities block. The amenities block would likely be connected to town water and sewerage systems.
- If required, a multi-user above ground diesel fuel tank with an approximate capacity of 20,000 litres. The storage tank would be bunded to meet the requirements of *Australian Standard 1940: Storage and Handling of Flammable and Combustible Liquids*, and include in-built dispensers.
- Operational lighting, connection to existing services, and associated plant and equipment.
- Common areas such as access ways and other areas where customer's users may interface with each other.

The Multi-User Facility is proposed to operate 24 hours per day seven days per week.

This development is likely to generate up to 600 trucks per day or 1,200 truck movements (incoming and outgoing) every 24 hours.

To give the reader a better understanding of the location of the site, it was considered appropriate to include **Figure B1** which shows the site in the local context and **Figure B2** which shows the site in the regional context. **Figure B3** shows the potentially sensitive receptors, as defined in the EPA's approved methods, in relation to the proposed location of the concrete batching plant since the AECOM AQIA did not identify any potentially sensitive receptors for the Multi-User Facility (Courtesy of Pacific Environment AQIA report). **Figure B4** shows the proposed site layout for the Multi-User Facility (Courtesy of AECOM AQIA report). It should be noted that the figures included in the AQIA prepared by AECOM did not include the North direction as required to ensure that a



clear comparison could be undertaken and the locations of sensitive receptors relative to the proposed site could be clearly shown. The figures appeared to be turned clockwise by approximately 65 degrees.

**Figure B1: Site Location in the Local Context – Multi-User Facility**



**Multi-User  
Facility**



Figure B2: Site Location in the Regional Context

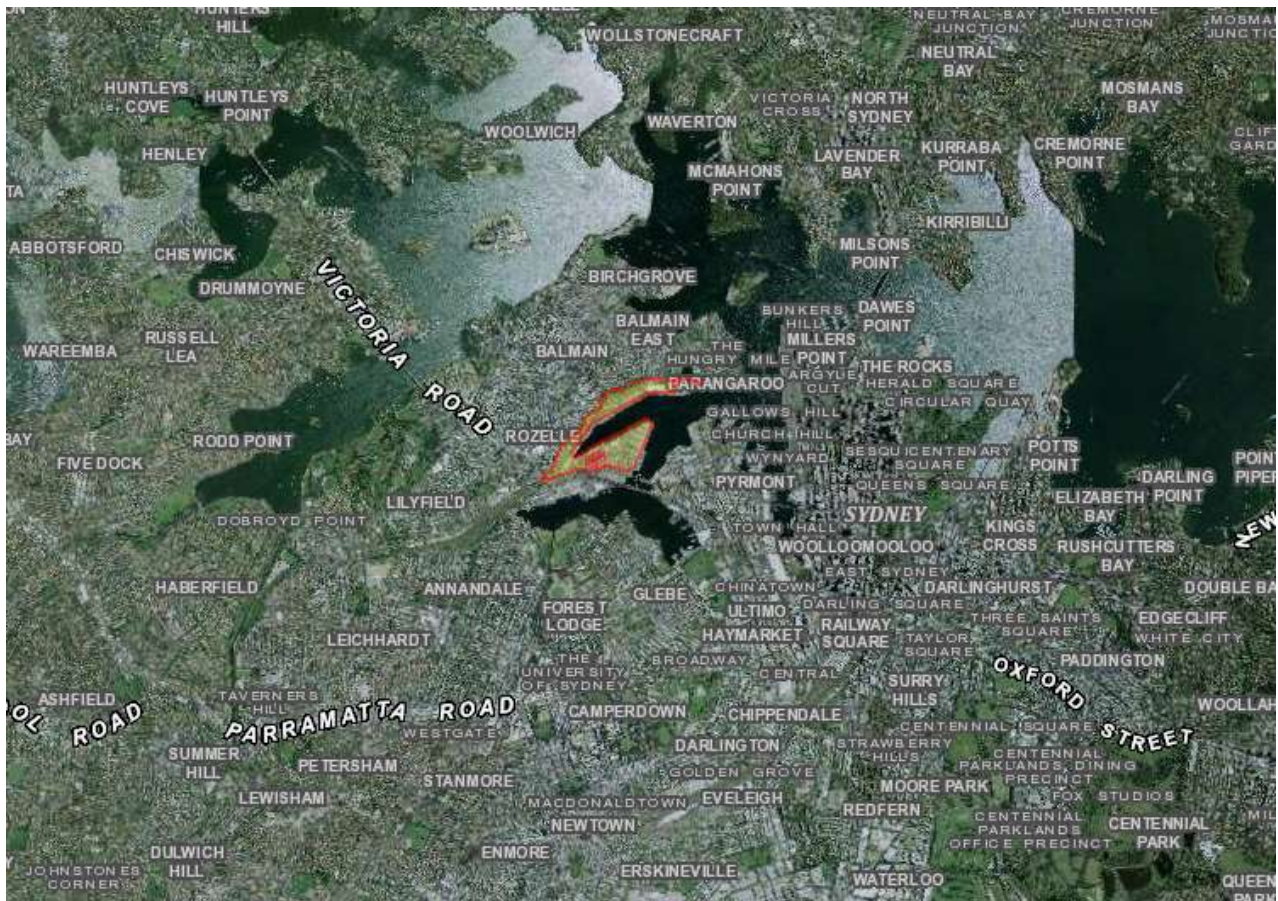


Figure B3: Potentially Sensitive Receptors in the Vicinity of the Multi-User Facility



Multi-User  
Facility



Figure B4: Site Layout of the Multi-User Facility



Multi-User Facility



### 3. INDEPENDENT PEER REVIEW FOR THE MULTI-USER FACILITY

A comprehensive review has been conducted in accordance with the EDO NSW request outlined in recent communications between EDO NSW and NICS. The requested review is to focus on the “Air Quality Impact Assessment” prepared by AECOM Australia Pty Ltd (AECOM) and dated 24 January 2017.

The review was focussed on several aspects including the following:

- Modelling Approach/Methodology,
- Interpretation of Modelling Results,
- Comparison of Results with EPA Criteria, and
- Adequacy of the Cumulative Impacts Assessment.

The independent peer review for each proposal is divided into two main Sections; **General Comments** and **Specific Comments**.

#### 3.1 GENERAL COMMENTS

The general comments included in this Section mainly apply to the overall Air Quality Impact Assessment (AQIA) undertaken as part of the preparation of the EIS for the proposal.

The Air Quality Impact Assessment methodology includes five (5) main stages as outlined below,

- 1 Input data collection;
- 2 Dispersion modelling;
- 3 Processing dispersion model output data;
- 4 Interpretation of dispersion modelling results; and
- 5 Preparation of an impact assessment report.

##### 3.1.1 Input Data Collection

Based on the EPA’s “*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*” (AMMAAP), *the first stage in the impact assessment is the collection of all the information required to complete the dispersion modelling. This includes development of an air emissions inventory; compilation of meteorological data; background air quality data; and terrain data.*

In my opinion the AQIA prepared for this proposal did not comply with this stage of the assessment since it did not collect any information relevant to the quantitative assessment.

##### 3.1.2 Dispersion Modelling

Due to the complexity of air emission sources within the proposed site and the different sections of the activities, the assessment should have been a Level 2 AQIA. However, no assessment was undertaken.

### 3.1.3 Processing Dispersion Model Output Data

*“Stage 3 of the assessment process is the prediction ground level concentrations (glcs) of pollutants in the region surrounding the premises. The predicted glcs of all pollutants must be in the same units and for the same averaging period as the relevant impact assessment criteria”.*

For this proposal, since there was no assessment undertaken but rather statements made about potential air emission sources, there were no predicted ground level concentrations (glcs).

### 3.1.4 Interpretation of Dispersion Modelling Results

The EPA’s Approved Methods have clear guiding information for the Interpretation of dispersion modelling results. Below are excerpts from these methods.

*“Stage 4 of the impact assessment is the interpretation of the dispersion modelling results. The predicted glcs are compared with the EPA’s impact assessment criteria and compliance indicates the proposal is unlikely to result in adverse air quality impacts.”*

Table B1 below includes the limits relevant to the proposed operations as extracted from the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2017)

Table B1: Relevant Limits from the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2016)				
Pollutant	Averaging Period	Concentration		Source
		µg/m <sup>3</sup>		
PM <sub>10</sub>	24 hours	50		DoE (2016)
	Annual	25		DoE (2016)
PM <sub>2.5</sub>	24 hours	25		DoE (2016)
	Annual	8		DoE (2016)
Nitrogen dioxide (NO <sub>2</sub> )	1-hour	246		NEPC (1998)
	Annual	62		NEPC (1998)
Sulfur dioxide (SO <sub>2</sub> )	10-minute	712		NHMRC (1996)
	1-hour	570		NEPC (1998)
	24-hour	228		NEPC (1998)
	Annual	60		NEPC (1998)
Total Suspended Particulates (TSP)	Annual	90		NHMRC (1996)
		g/m <sup>2</sup> /month <sup>a</sup>	g/m <sup>2</sup> /month <sup>b</sup>	
Deposited Dust	Annual	2	4	NERDDC (1988)

a Maximum increase in deposited dust level.

b Maximum total deposited dust level

Since no assessment was undertaken, it is not possible to compare statements of potential air emission sources with the EPA's limits/criteria as depicted in Table B1.

### 3.1.5 Preparation of an impact assessment report

*"Stage 5 of the impact assessment is the preparation of a report. The air quality impact assessment report must be prepared in accordance with the requirements specified in Section 9 of the Approved Methods."*

The AQIA report for this proposal is inadequate and certainly does not comply with the EPA's requirements.

## 3.2 SPECIFIC COMMENTS

The Specific Comments will focus on the specific objectives requested by the EDO NSW as outlined below.

*f) Are the air quality assessments undertaken for the Projects adequate? In particular, have the cumulative air quality impacts, including ship emissions, been properly considered?*

For the construction stage of the proposal, only qualitative rather than quantitative methodology was used to determine the extent of the air emissions impact on sensitive receivers. This methodology could be subject to the individual's interpretation, judgement and discretion rather than being based on more robust scientific, technical and mathematical arguments. However, this methodology has been widely used in the United Kingdom and Australia by Environmental Consultants and appears to be acceptable to NSW Government Authorities despite the fact that there is no formal or official endorsement of this methodology.

For the operation stage of the proposal, the Air Quality Impact Assessment undertaken by the consultant is inadequate since no quantitative assessment was undertaken. This is clearly unacceptable when considering the potential impact on neighbouring properties including residents from similar activities at other locations within NSW.

The report did not provide justification for not undertaking such a quantitative assessment in accordance with current NSW government well established guidelines and approved methods as listed in Section 1.2 and in the Reference Section of this document. The AQIA included only statements associated with the potential air emission sources from within the proposed facilities.

*g) Are the predictions of air quality impacts on neighbouring residents reasonable and appropriate?*

As stated above, for the construction stage of the proposal, only qualitative rather than quantitative methodology was used to determine the extent of air emissions impact on sensitive receivers. It is very difficult to determine the extent of impact on neighbouring residents based on a qualitative rather than quantitative assessment. However, the results of this assessment demonstrated that the impact is likely to be low.

For the operation stage of the proposal, there are no predicted ground level concentrations to be compared with the EPA's limits/criteria.

*h) Are any proposed avoidance and mitigation measures for minimising impacts appropriate?*

For the construction stage, the AQIA has recommended several proposed safeguards (mitigation measures) to be implemented on site to reduce the potential for air emissions as a result of the construction activities. These mitigation measures are appropriate for most construction sites and possibly for the construction stage of this proposal.

For the operation stage of the proposal, the AQIA has recommended several proposed safeguards (mitigation measures) to be implemented on site to ensure that the specific activities are undertaken in a manner that minimises environmental impacts. These proposed safeguards are inadequate and do not address the potential air emissions at the source but rather at the path and receiving end of the air emissions.

It is advisable that more site specific rather than generic mitigation measures and amelioration strategies should be developed for both the construction and operation stages of the development.

*i) Explanation of the likely air quality impacts on adjoining residents (within approximately 300m of the facilities and ship berths), having regard to the cumulative effects of both facilities and associated shipping*

Response to this request is provided at the Conclusion Section of this document.

*j) Provide any further observations or opinions which you consider to be relevant*

Response to this request is provided at the Conclusion Section of this document.

## 4. CONSIDERATION OF THE TWO PROPOSALS TOGETHER

Due to the fact that both proposals will be located on the same section of Glebe Island, I have provided additional information which will put the two proposals in a better perspective when they are presented together rather than individually.

**Figure 4-1** shows the relevant section of Glebe Island where the two proposals will be located. Based on figures obtained from both assessments, it appears that the proposals main boundaries are likely to overlap by several metres. This is clearly evident in **Figure 4-1** below.

It is also clearly evident that the access road which will be used for the Multi-User Facility as shown in **Figure B4** will be located within the Concrete Batching Plant boundaries.



Figure 4-1: Glebe Island – Concrete Batching Plant and Multi-User Facility



Glebe Island, NSW – New Proposals

## 5. FINDINGS AND CONCLUSIONS OF THE PEER REVIEW

To assist in making determinations and decisions on certain aspects of the review, it was considered appropriate not to duplicate all tables and figures but rather include only representative tables, if required.

The following findings and conclusions are made:

- It is clearly evident that the AQIA prepared for the concrete batching plant is very comprehensive and was undertaken in accordance with current EPA's approved methods. On the contrary, the AQIA prepared for the Multi-User Facility is inadequate and it does not meet the fundamental and basic requirements included in the EPA's approved methods.
- The assumptions used in the AQIA for the concrete batching plant are consistent with current NSW requirements especially in the EPA's Approved Methods,
- All the tables included in the AQIA for the concrete batching plant are consistent and appropriate except for Tables 8.3 and 8.4 which should be reviewed and revised for the reasons stated in section 2.1.4. It appears that the results for NO<sub>x</sub> are inconsistent with the results and the adopted background levels for NO<sub>x</sub> as presented in Table 5-6 of the AQIA. The cumulative values cannot be lower than the incremental values and certainly cannot be lower than the adopted background values presented in Table 5-6. Therefore, we are uncertain whether for a peak operational day the NO<sub>x</sub> emissions from the proposed development comply with the EPA's criteria as depicted in **Table A1** or not,
- Air emissions from the concrete batching plant comply with the current NSW Air Quality criteria without the inclusion of the potential additional air emission values from the Multi-User Facility. The reasons for this may have been the absence of such values since the AQIA for the Multi-User Facility did not include quantitative air emission assessment,
- For the Multi-User Facility, the proposed safeguards do not provide confidence that the safeguards would work especially during the operation stage of the development since they do not target an outcome or a possible reduction due to the absence of quantitative air emission assessment. Any mitigation measures or amelioration strategies should be developed for the specific air emission sources and in particular the most dominant air emission sources as it would have been the case if a quantitative assessment was undertaken in accordance with the EPA's requirements and approved methods,
- The selection of a representative year for the use of meteorological data is inconsistent between the two proposals which does not give confidence to the stakeholders including the community. This is an extremely important factor for the prediction model especially under prevailing weather conditions. The prevailing weather conditions for the two proposals are different and will produce different ground level concentrations at different receptors,
- Similarly, the use of different weather monitoring stations is inconsistent between the two proposals,

- For the Multi-User Facility, it is proposed to have 600 trucks every 24 hours. This means that the number of movements from and to the facility will be 1,200 every 24 hours. Assuming that every truck will take approximately 30 seconds to enter or leave the enclosed building through the roller door. This means that one or more roller doors will be open for  $1,200 \times 0.5$  minutes = 600 minutes (10 hours) every 24 hours. Based on the above, air emissions through the roller doors are unknown and unquantified. These air emissions should be calculated/modelled on the basis that these air emissions are leaving the building for 41.67% of the 24 hours. As it is also unknown whether mechanical air ventilation will be provided for the enclosed building and what the hourly number of air changes to ensure that the employees, including truck drivers, are not subjected to high levels of air emissions, the extent of air emissions through the mechanical ventilation is unknown and unquantified. In addition, many other sections of the building will be open during the shipment unloading of materials into the bays inside the building. Any AQIA should include also the air emissions through all the above air emission sources,
- According to AECOM, for the Multi-User Facility a Review of Environmental Factors report was prepared rather than an Environmental Impact Statement due to the fact that there will be minimal potential impact on the environment. I do not agree with this determination since for the assessment of potential impact on human health and environment due to air emissions alone an EIS should have been prepared. When considering the traffic impact, noise and cumulative impacts from all the proposed activities, I believe that an EIS should have been prepared,
- The potential impacts on marine life and heritage listed items in the vicinity of both proposals were not considered in details. The air emissions, noise and vibration generated by the proposed activities will certainly have the potential to interfere with marine life and may cause significant damage to the heritage listed items located in the vicinity of the proposals,
- None of the AQIA recommended any air monitoring program at any location which is very unusual for such highly dense urban areas whilst air monitoring is a mandatory condition imposed by the relevant consent and/or determining authority even for similar activities in rural and semi-rural areas where the number of potentially affected receptors is only a handful,
- I do not agree that the concrete batching plant proposal will remove 65,000 truck trips per year from NSW regional roads network to be a justification for the proposal, because the proposal will create 502,970 truck movements per year on Sydney's local roads based on 689 trucks per day or 1,378 truck movements per day for 365 days per year.



## 6. RECOMMENDATIONS OF THE PEER REVIEW

Based on the outcome of the peer review, findings and conclusions, it is recommended that the decision on this proposal by the determining authority be reserved until the following recommendations are considered and adequately addressed by the proponents:

### **A The Concrete batching plant**

- ✚ Confirm the accurate location of the proposed development in relation to the proposed Multi-User Facility,
- ✚ Confirm the number of trucks to be generated from the proposed development including those transporting any materials from and to the site,
- ✚ Confirm the truck routes to be adhered to by the truck drivers,
- ✚ Provided that the data is available and/or is easily obtainable, the cumulative impact assessment should include air emission values from the adjacent proposed Multi-User Facility as well as the M4-M5 Link as mentioned previously in this document,
- ✚ Confirm that the chosen year for meteorological and air quality background levels is the most representative year for that specific location,
- ✚ Confirm that the chosen weather monitoring station is the most appropriate and representative to be used for this proposal,
- ✚ All proposed air emission mitigation measures must be reviewed and revised to ensure that they are specific for that proposal rather than being generic for similar activities. This review and revision should include the recommended mitigation measures for both the construction and operational stages,
- ✚ Tables 8-3 and 8-4 of the AQIA should be reviewed and corrected to reflect the actual predicted incremental ground level concentrations as well as the actual cumulative ground level concentrations after adding the air quality background concentrations determined in accordance with the EPA's approved methods,
- ✚ It is also recommended that the consent and/or determining authority include in their conditions air emission validation assessment to be undertaken during both the construction and operation stages to confirm or otherwise the predicted incremental and cumulative ground level concentrations,
- ✚ It appears that no air quality monitoring is recommended in the AQIA to verify, confirm or otherwise whether the predicted Ground Level Concentrations are approximately the same with those measured at certain locations. As a minimum, an Air Quality Verification Assessment should be undertaken during both construction and operation stages of the proposals. In addition, regular air quality monitoring must be undertaken at a minimum of four (4) locations (one (1) in each direction or as agreed with the stakeholders) with a focus on those sensitive receptors that are potentially affected by the prevailing wind,

- ✚ Since both proposals are adjacent to each other and there is one way out of this precinct, it will be extremely difficult to manage approximately 2,578 (1,200+1,378) truck movements every 24 hours through the boom gate. This means that there are or 3.5 truck movements associated with these two (2) proposals alone travelling through that gate every 2 minutes. This is equals to a total 107 truck movements per hour on a normal operational day.

## **B The Multi-User Facility**

- ✚ Confirm all activities to be conducted on site as part of the proposal,
- ✚ Determine all potential air emission sources associated with all activities proposed for the site and classify them as appropriate whether they are point, area or volume sources. This should include loading, unloading, conveyors, stockpiles, wall openings, doors, ships and truck exhausts,
- ✚ Confirm all parameters that will affect the air emissions including the number and locations of mobile plants, to be utilised daily,
- ✚ Confirm all structures' dimensions and in particular those that are likely to generate air emissions (i.e. stockpiles and transfer of materials) to ensure that more accurate calculations (and computer modelling) are undertaken,
- ✚ Consider the implementation of additional mitigation measures at several sources to ensure that the EPA's air impact assessment criteria for this site are complied with,
- ✚ It appears that no air quality monitoring is recommended in the AQIA to verify, confirm or otherwise whether the predicted Ground Level Concentrations are approximately the same as those measured at certain locations. As a minimum, an Air Quality Verification Assessment should be undertaken during both construction and operation stages of the proposals. In addition, regular air quality monitoring must be undertaken at a minimum of four (4) locations (one (1) in each direction or as agreed with the stakeholders) with a focus on those sensitive receptors that are potentially affected by the prevailing wind,
- ✚ Since both proposals are adjacent to each other and there is one way out of this precinct, it will be extremely difficult to manage approximately 2,578 (1,200+1,378) truck movements every 24 hours through the boom gate. This means that there are 3.5 truck movements associated with these two (2) proposals alone travelling through that gate every 2 minutes,
- ✚ To provide all stakeholders (i.e. Community, Government and non-Government Organisations) with confidence that the proposal will have a minimal to nil impact on human health and the environment, it is recommended that a site-specific sensitivity analysis be undertaken by the proponent as part of any additional air quality assessment as is recommended by the EPA's Approved Methods. The sensitivity analysis should take into consideration all assumed parameters entered in the computer model including emission rates, prevailing weather conditions, extraordinary adverse conditions, market fluctuation/product demand and other possible scenarios that could be required by the NSW authorities. These scenarios may not have been considered previously by the

proponent but are likely to occur in future. These scenarios should focus on TSP and PM<sub>10</sub> and PM<sub>2.5</sub>,

- ✚ In summary, the AQIA should be re-done to ensure that the methodology, the calculations, the results, interpretation of results, summary of results are compliant with current EPA approved methods, that they are robust and represent either site specific air emissions or worst case scenarios.

## 7. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for undertaken of and reporting on environmental Peer Reviews. No guarantees are either expressed or implied.

This Environmental Peer Review Report has been prepared solely for the use of EDO NSW, as per our agreement for providing environmental services. Only EDO NSW is entitled to rely upon the information provided in this report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this report, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by EDO NSW, for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

## 8. ACKNOWLEDGEMENT

I acknowledge that I have read and understood the Expert witness code of conduct as outlined in Schedule 7 of the Uniform Civil Procedure Rules 2005 (NSW) and confirm that I have prepared this document to the best of my ability in accordance with this code of conduct.

A handwritten signature in black ink, appearing to read 'N. ISRAEL', is positioned above the printed name.

**Nicolas Israel** MIEAust MEIANZ PEng  
Director  
National Integrated Creative Solutions &  
Environmental Risk Assessors Pty Ltd

## 9. REFERENCES

- 1 Protection of the Environment Operations Act 1997
- 2 Environmental Planning & Assessment Act 1979
- 3 Environmental Planning and Assessment Regulation 2000
- 4 Protection of the Environment Operations (Clean Air) Regulation 2010
- 5 NSW Environment Protection Authority, "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales", August 2017
- 6 NSW Environment Protection Authority, "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales", January 2007
- 7 NEPC (1998), "Ambient Air – National Environment Protection Measures for Ambient Air Quality" National Environment Protection Council, Canberra;
- 8 NEPC (2003), "Variation to the National Environment Protection (Ambient Quality) Measure for Particles as PM<sub>2.5</sub>", May 2003;
- 9 US EPA (1995), "Compilation of Air Pollutant Emission Factors". AP-42, Fourth Edition United States Environmental Protection Agency, Office of Air and Radiation Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711. Note this reference is now a web-based document.
- 10 National Pollutant Inventory Emission Estimation Technique Manual (NPI EETM) for Mining (2012);
- 11 National Pollutant Inventory Emission Estimation Technique Manual (NPI EETM) for Mining and Processing of Non-Metallic Materials (2014); and
- 12 National Pollutant Inventory Emission Estimation Technique Manual (NPI EETM) for Concrete Batching and Concrete Product Manufacturing (1999).
- 13 United Kingdom Institute of Air Quality Management document "Guidelines for assessment of air