# ENVIRONMENTAL IMPACT STATEMENT
# CONCRETE PRODUCTS BATCHING PLANT
# 33-41 COWPASTURE ROAD
# WETHERILL PARK, NSW

*Prepared for:* Austral Precast Pty Ltd
Sasso Precast Concrete
Brickworks Ltd

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*Prepared by:* R T Benbow, Principal Consultant
BENBOW ENVIRONMENTAL

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*Report No:* 110083 EIS.doc
December 2010
(Released: 21 December 2010)

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Benbow
ENVIRONMENTAL

*Engineering a Sustainable Future for Our Environment*

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Submission of
Environmental Impact Statement (EIS)
prepared under the Environmental Planning and Assessment Act 1979 Section 78(A)

## EIS prepared by

| | |
|---|---|
| name | Richard T Benbow |
| qualifications | Bachelor of Science (Engineering) With Merit |
| address | Benbow Environmental<br>13 Daking Street<br>North Parramatta NSW 2151 |
| in respect of | An addition of an in-situ concrete batching plant to an existing concrete works industrial plant |

## development application

| | |
|---|---|
| applicant name | Austral Precast Pty Ltd |
| applicant address | 33-41 Cowpasture Road<br>Wetherill Park NSW 2164 |
| land to be developed: address | 33-41 Cowpasture Road<br>Wetherill Park NSW 2164 |
| lot no, DP/MPS, vol/fol etc | Lot 79, D.P. 27515 |
| proposed development | In-situ Concrete Products Batching Plant To Be Built With An Existing Precast Concrete Manufacturing Plant |
| | or<br>☐ map(s) attached |

## environmental impact statement

☑ an environmental impact statement (EIS) is attached

## certificate

I certify that I have prepared the contents of this Statement and to the best of my knowledge

- it is in accordance with clauses 72 and 73 of the Environmental Planning and Assessment Regulation 2000, and
- it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

| | |
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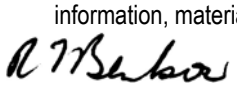
| signature |  |
| name | Richard T Benbow |
| date | 21 December 2010 |

# LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use by Austral Precast, as per our agreement for providing environmental assessment services. Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document.

Austral Precast is entitled to rely upon the findings in the report within the scope of work described in this report. No responsibility is accepted for the use of any part of the report in any other context or for any other purpose.

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

CONTENTS PAGE

TABLES PAGE

FIGURES PAGE

# ATTACHMENTS

STUDY TEAM

| | | |
|---|---|---|
| R.T. Benbow | Benbow Environmental | Project Manager |
| Gusni Melington | Benbow Environmental | Environmental Impact Statement Compilation |
| Anita Joh | Benbow Environmental | Water Quality Assessment |
| Filbert Hidayat | Benbow Environmental | Air Quality Assessment |
| Duke Ismael | Benbow Environmental | Air Quality Assessment, Environmental Impact Statement Compilation |
| Felipe Torres | Benbow Environmental | Environmental Noise Assessment |
| David Haskew | Rhodes Haskew & Associates | Planning & Traffic Assessment |
| Charlie Zappia | Algorry Zappia & Associates | Architect & Landscaping / Visual Assessment/Site Plans |

DOCUMENT REVISION AND DISTRIBUTION

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ABBREVIATIONS

| Abbreviation | |
|---|---|
| ABL | Assessment background level |
| ABS | Australian Bureau of Statistics |
| AHD | Australian Height Datum |
| AMMAAP | Approved Methods for the Modelling and Assessment of Air Pollutants in NSW |
| BOM | Bureau of Meteorology |
| DA | Development Application |
| DCP | Development Control Plan |
| DECCW | Department of Environment, Climate Change and Water |
| DEWHA | Department of the Environment, Water, Heritage and the Arts |
| DPI | Department of Primary Industry |
| DNR | Department of Natural Resources |
| DoP | Department of Planning |
| DWE | Department of Water and Energy |
| EEC | Endangered Ecological Community |
| EMP | Environmental Management Plan |
| EPA | Environment Protection Authority (now known as the DECCW) |
| EP&A Act | Environmental Planning and Assessment Act 1979 |
| EPBC Act | Environmental Protection and Biodiversity Conservation Act 1999 (Cmth) |
| EPL | Environment Protection Licence |
| ERP | Emergency Response Plan |
| ESD | Ecological Sustainable Development |
| GDE | Groundwater Dependent Ecosystem |
| Ha | Hectares |
| INP | Industrial Noise Policy (guidelines developed by the NSWEPA) |
| KT | Kilo Tonnes |
| LALC | Local Aboriginal Land Council |
| LEP | Local Environment Plan |
| $m^3$ | Cubic metres |
| Mbgl | Metres below ground level |
| Mt | Million tonnes |
| NES | National Environmental Significance |
| NSW | New South Wales |
| $PM_{10}$ | Particulate matter of size 10 $\mu$m |
| RBL | Rating background level |
| RTA | Roads and Traffic Authority |
| SEPP | State Environmental Planning Policy |
| T | Tonne (1000kg) |
| TMP | Traffic Management Plan |
| Tpa | Tonnes per annum |
| TSC Act | Threatened Species Conservation Act 1995 |
| TSP | Total suspended particulates |
| VENM | Virgin Excavated Natural Material |

# EXECUTIVE SUMMARY

The Environmental Impact Statement (EIS) has been prepared by Benbow Environmental to assess the potential environmental impacts of a proposed concrete products batching plant to be established on an existing concrete product manufacturing site on behalf of the proponent, Austral Precast Pty Ltd.

The preparation of the EIS has been project managed for the proponent by Richard T Benbow of Benbow Environmental. The EIS has been compiled from expert reports and plans prepared by:

- Rhodes Haskew & Associates – Planning & Traffic Assessment; and
- Charlie Zappia – Architect & Landscaping / Visual Assessment.

The EIS has been compiled after consultation with the following persons and Government bodies:

- Adjoining industrial plants;
- Fairfield City Council;
- Service providers;
- Department of Environment, Climate Change and Water (DECCW);
- Sydney Water; and
- Transgrid.

The proposed site is identified as 33-41 Cowpasture Road, Wetherill Park. Its property description is Lot 79, D.P. 27515.

The site is located at a corner of an industrial area. The local regional area of the subject site location is predominantly populated by industrial premises such building materials manufacturing facilities, adhesives production, paper manufacturing industries and warehousing.

The EIS addresses issues raised through the consultation process with the local government, statutory authorities and the proponent. The assessment process has given strong consideration to cumulative issues associated with the existing activities in the area.

The proposed development, besides being designated, is also integrated and would need to be licensed by the DECCW.

## Outline of the Proposal

The proposed development seeks to construct a concrete product batching plant within an existing concrete product manufacturing plant located at 33-41 Cowpasture Road, Wetherill Park.

The source of solid raw materials would be sand, aggregates, cement and flyash. Water is also used in the production process, as are minor quantities of chemical additives. Sand and aggregate raw materials would be stored in the proposed above ground storage bins whilst the cement/flyash raw materials would be stored in the proposed silos.

It is envisaged that the site would approximately produce 60,000 $m^3$ of ready-mix concrete per year as a supply to their existing precast concrete manufacturing facility.

In summary, the proposal would involve the following activities until a decision to alter the operations on site are made:

- Receipt of approximately 60,000 $m^3$ per annum of raw materials, which principally include sand, aggregates, cement; flyash and water; and
- Production of ready-mix concrete at a capacity of up to 60,000 $m^3$ per annum, which is used as a raw material for their precast concrete manufacturing plant at the same address.

Concrete for production of precast concrete panels is currently brought to site in truck mounted mixers. The proponent advocates there is greater efficiency and control of higher standards of production quality if the concrete is batched on site.

A state of the art concrete batching plant would be purchased from Germany. This plant would have twin stationary mixers to ensure consistency in the quality of the concrete and the production demands of the precast manufacturing plant that already exists on site.

The proposed location of the concrete plant would be at the front of the site and strenuous efforts have been expended in the visual design of the plant. Fairfield City Council has developed the industrial estate of Wetherill Park so that it has one of the highest qualities of visual appearance in Australia.

Although this site is at the northern end of Cowpasture Road the standard of visual appearance and inclusion of landscaping is in harmony with the objectives of Fairfield City Council.

The replacement of deliveries of ready mixed concrete with concrete batched on site will have the benefit of reduced traffic, less use of diesel fuel and the opportunity to add a closed loop waste concrete recycling system that avoids the need to dispose of concrete waste materials off site.

Given the location of the Prospect Reservoir, Sydney Water's Prospect Water Filtration Plant and other potentially sensitive land within proximity to the subject site, the need to maintain the control of environmental impacts from the site will ensure this occurs. The proposed plant would be a significant departure from the usual concrete batching plants delivering ready mixed concrete in truck mounted mixers. The Sasso Concrete Plant would be enclosed and would have a closed loop recycling plant so that waste concrete from the cleaning of the twin mixers is able to be reused on site. Waste water generated in the concrete batching process would be collected and reused. Rainwater harvesting would be practised using stormwater collection at the truck delivery ground hopper and where space permits elsewhere on site in rainwater holding tanks.

The proposed development would be required to operate to the conditions of consent, Environment Protection Licence conditions, and an Environmental Management Plan (EMP) prepared to the principles of ISO 14001.

### The Study Area

The EIS addresses a study area that encompasses the immediate neighbouring properties within a 3 km radius from the subject site.

### Consultation

As the site is existing and is an extension to an existing industrial development, there is limited need for consultation.

Relevant statutory authorities consulted have been Fairfield City Council, DECCW, Sydney Water, Transgrid, the immediate industrial neighbours and the nearest residence during the noise logging.

The issues of concern raised by the statutory authorities have been considered in designing the concrete plant. These issues are discussed in detail in the EIS.

### Justification

The precast products currently manufactured on site are concrete wall and flooring panels used in the construction process of commercial, industrial and residential buildings. The panels are able to be produced using a continuous process inside the existing manufacturing plant. This plant has been in operation over the past 7 – 8 years.

The proponent aims to be able to produce the raw materials (i.e. ready-mix concrete) required for the existing precast manufacturing facility using the current best design from Germany, which would adapt best practice production methods and adhere with ecological sustainable principles for waste reuse.

The main ecological sustainability principles adopted would relate to the reduction of emissions associated with the transfer (i.e. use of vehicles to deliver ready-mix concrete) of ready-mixed concrete from production (i.e. concrete batching plant) to end-consumer (i.e. pre-cast manufacturing facility). The ability to introduce recyclable materials such as cemintitious materials (e.g. fly ash or ecoslag) would reduce the site's environmental impacts and provide future areas for improvement, which would not be existing at the site's current method of operation.

The concrete plant will include a Bibko waste recycling process which is able to convert the waste washed out of the twin mixers into dried, clean aggregate and slurry, both of which are able to be added back into the production processes. Hence a closed loop waste to recovered material will form part of the concrete plant.

### Community Benefits

The proposed expansion of the site will increase employment by a small number, typically 14, and will increase the production quality of the precast panels.

There will be improvements in the efficiency of the manufacturing processes and these factors have a flow on benefit to the construction industries that utilise the products from the site.

The construction system that relies on the precast panels has benefitted the economic development of numerous factory units, larger scale buildings and infrastructure developments (e.g. acoustic barriers).

There are no adverse impacts on adjoining premises or the small number of residents distant to the west of the site. There are benefits to the wider community that will become more evident in the body of the EIS.

### Alternatives

An alternative to the proposal would be to locate the proposed concrete plant adjacent to or relatively close to the existing precast manufacturing facility but on another site. However, alternatives of this nature would contradict the purpose of the proposal – which is to eliminate the vehicle movements required to deliver ready-mix concrete materials. Therefore, this limits the alternative options available.

No other sites were evaluated due to the proponents' ownership of the proposed site location. The site was previously identified for the proposed operations in a previous EIS, with considerations to some environmental controls and management plans.

Alternative locations on site were considered. There is only one other area available on site where the concrete can be produced and transferred to the process. This is on the south side of the existing plant.

However this area is subject to the easement for the power line that passes over the site and therefore not the preferred location for the concrete plant.

This area would also cause significant truck congestion during deliveries of the raw materials. The access to the rear of the site would become blocked during manoeuvring of the trucks delivering raw materials.

The location chosen for the concrete plant has potential visual impacts and to resolve these, the plant will be enclosed. The need to enclose the street facing side therefore led to roofing the plant with the environmental advantages of preventing rainwater becoming contaminated with sediment.

Although noise management is not a significant issue for this operation, the need to enclose the plant will result in the concrete plant being inaudible at night time and will enable the process to operate 24/7 if required.

The movement of raw materials will be able to enter off a new single way driveway at the front of the site that would allow trucks to enter in a forward direction, unload the material (aggregates and sand) and drive out of the site using the existing driveway.

This is of significant importance to the management of traffic flows on site.

The alternative of reversing trucks inside the front of the site would be disruptive to the economic function and safety management of the site.

### Objectives of the Proposal

The objectives of the proposal are summarised as follows:

- Produce ready-mix concrete on site, which can be transferred directly into the existing Precast Concrete Manufacturing Facility, which can be established by:
  - Constructing a Concrete Batching Plant adjacent to the existing Precast Concrete Manufacturing Facility; and
  - Modifications to the existing Precast Concrete Manufacturing Facility's buildings and equipment, to allow its operations to be integrated with the Proposed Concrete Batching Plant.
- Provide significant storage of raw materials to enable daytime deliveries of these materials sufficient for several days' production.
- Use 150 tonne bins to store the aggregate and sand to control moisture and to allow gravity loading of the materials transfer equipment to the twin mixers.
- Integrate a closed loop waste reuse process so that bins with a wet aggregate – sand – alkaline slurry mixture is not generated.

  Instead aggregates will be separated, dried using a mechanical process and able to be stored with no water runoff.

  Slurry will be transferred to a process tank with a continuous stirrer to maintain the fines in suspension. The slurry will be reused in the batching process.

The Bibko system from Germany is world renowned and provides a proven closed loop system that already operates at over 1000 concrete batching and precast concrete products plants in Europe and USA.

### Assessment of the Impacts

The preparation of the EIS has considered impacts to the surrounding community and the design of the proposed development readily minimises off-site environmental impacts.

Engineered controls to minimise potential impacts have been incorporated as inherent design features (during the design stage of the development) into the proposed development.

A brief summary of the main environmental impacts is presented below.

### Land Use Zoning

The land is zoned general industrial and the development as proposed is permissible with consent. The development as designed is consistent with the objectives of this zoning.

### Site Contamination

The activities at the site have very low risk of causing soil or groundwater contamination.

The site operates in accordance with environmental management procedures and has stormwater isolation valves in place as a safeguard.

### Visibility

The site can be clearly visible from a number of viewpoints. An extensive effort to design the proposed activities to reduce the visibility has been undertaken.

View of the site will be softened by enclosing the plant and enhancing landscaping on site. As a result the activities of the site will not be discernible from passing traffic and barely visible from the nearest receptors (e.g. residences).

### Identification and Prioritisation of Issues

The identification and prioritisation of the potential environmental impacts of the proposed development was a fundamental step in preparing the EIS.

This process involved the following stages:

- Visual impacts;
- Ecologically sustainable development assessment;
- Air quality;
- Noise impact assessment;
- Ecological (Flora & Fauna) assessment;
- Groundwater, surface water, and salinity;
- Planning requirements;
- Assessment of Fairfield City Council requirements and expectations;
- Assessment of requirements for the EIS from the DoP and DECCW;
- Presence of Sydney Water facility and Prospect Reservoir; and
- Presence of Transgrid's easement.

These steps led to the design and objectives of the Proposal.

The statutory requirements and government guidelines in conjunction with the government consultation process confirmed the presence of issues including:

- Visual impacts;
- Noise amenity;
- Air quality;
- Ecological (flora and fauna) and
- Traffic.

### Groundwater, Surface Water, and Salinity

Assessment shows that water impacts will be negligible.

### Waste Management

The concrete plant will not produce concrete for off site usage. Therefore it will not generate even moderate quantities of waste concrete.

The concrete plant therefore will not be generating a waste stream that requires off site disposal.

### Visual Impacts

Expert advice has been obtained from Algorry Zappia & Associates and detailed information on this advice has been included in this document.

The pre development application meeting held on the 8 September 2010 with attendees from Algarry Zappia, Benbow Environmental, the proponent, and Fairfield City Council provided outcomes that a landscaping plan would be required in order to soften the visual impacts from the proposed concrete batching plant to be located at the frontage of the existing site.

A landscaping plan was prepared, with a final version made based on feedback from the landscaping plan expert from Fairfield City Council and Algorry Zappia & Associates, and this information has been provided in the document.

### Noise Amenity

The need to protect the amenity of the rural residences was considered paramount to preparing the EIS. If noise levels could not be satisfied to comply with the NSW EPA (i.e. DECCW) Industrial Noise Policy (INP) then the development process would have to be stopped.

The noise criteria established from noise logging can be readily satisfied, detailed modelling using SoundPlan was undertaken.

### Air Quality

Particulates are the predominant air pollutant that could be released from the activities of the proposed development. The air dispersion modelling, CALPUFF, has been used to model the potential dust and particulate impacts from the proposed development after the application of engineered air emission controls, which are part of the proposed development plan.

The assessment has confirmed that the proposed engineered air emission controls are sufficient in reducing the emissions from the proposed development and that there was no need to provide any additional controls. The outcome of the assessment indicates that the existing environmental management procedures currently being upheld on site would also be significant in regulating these emissions.

### Ecological (Flora and Fauna)

It was determined that an ecological assessment is not required, given that the site location of the proposed development is developed land. Therefore, an ecological assessment was not undertaken.

### Traffic

A traffic statement has been provided by Rhodes Haskew and Associates. As a result of their expert advice, the driveway entrance has been relocated.

The development as proposed will lead to a useful reduction in the truck movements to the site as a result of the on-site batching of concrete.

### Road Traffic Noise

There will be no increase in traffic noise levels as a result of this development. It is expected that reduced truck usage will reduce truck related noise on Cowpasture Road. This is not a significant issue for the residents distant to the west of the site.

## Environmental Management Plan

It is recommended that an Environmental Management Plan (EMP) be developed to the principles of ISO 14001.

The EMP would be designed to maintain the minimisation of environmental impacts from the site. This includes minimisation of impacts to air, noise and water. The EMP would include procedures to inspect the controls implemented on site.

## Ecological Sustainable Development

Ecological Sustainable Development (ESD) is growing in its acceptance amongst the community.

The Department of Environment and Heritage website defines ESD as "*development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs*".

Principles associated with ESD have initiated this proposal.

At present ready mixed concrete is produced off site and trucked to site. The proposal will replace these relatively small volume of deliveries i.e. 5 - 6.5 $m^3$ of concrete with trucks with larger net pay loads of aggregate and sand.

Therefore there will be a reduction in the fossil fuel associated with road transport.

Truck mounted mixers use the truck engine to power a hydraulic pump and the pump delivers the hydraulic fluid under high pressure to a hydraulic motor. This motor drives the mixer.

The proposed plant will use electric geared motors operating off power from the grid and at far higher levels of efficiency.

The truck mounted mixers need to return to their plant of origin and routinely be washed unless another trip to the Sasso site can be co-ordinated. Washing of the mixer barrel generates waste that is not reused on site but is transported elsewhere for recycling.

The proposed plant uses two mixers which do not require routinely cleaning as the concrete slump and strength between batches does not vary.

The plant will incorporate a closed loop waste concrete washing process which enables the waste to be converted into dried aggregates and slurry. Both materials are able to be reused on site.

The plant as designed will be roofed. This will avoid generation of contaminated rainwater and the need for a first flush system. These are very positive improvements to the use of natural resources.

To a limited extent rainwater harvesting will be able to be practised.

The main environmental safeguards to be implemented so that the environment is maintained include:

- Visibility;
- Noise;
- Dust and particulates;
- Surface water runoff;
- Waste management;
- Reduction in fossil fuel usage; and
- Environmental Management System.

The proposed plant brings to Australia the world's best technology for manufacture of concrete for precast concrete products. The benefits may be applied at other concrete batching plants as these become well known.

## Greenhouse Gas Emissions

Increasingly our communities are recognising the need to address climate change and greenhouse gas emissions, regardless of the current appreciation of the connection of the two. The principles of ESD are vital to be addressed to conserve our current usage rates of fossil fuels.

The development as proposed has considered the benefits that are able to be achieved in reducing greenhouse gas emissions.

Although the reduction is not significant this still has a benefit and further encourages other manufacturing companies to consider climate change and reduction in energy usage in the selection of process equipment.

## Concluding Remarks

The EIS has undertaken detailed consideration of potential issues related to the proposed development and designed methods of solving any issues that may arise.

The studies undertaken have assessed the issues from Fairfield City Council, DECCW, and DoP. The skills of the various experts involved in the design of the development have resulted in a development appropriate for this site.

Approval of the development is requested.

# 1. INTRODUCTION

Sasso Property Pty Ltd trading as Austral Precast Pty Ltd, with ABN 91 125 934 938, propose to develop their site at 33-41 Cowpasture Road, Wetherill Park by constructing a concrete batching plant to be integrated with the existing precast manufacturing facility.

The activities of the site require licensing by the Department of Environment, Climate Change, and Water and this is pending. This licence when issued will need to be modified to incorporate the activities of the proposed development. The proposal as described in this Environmental Impact Statement is a designated development and is integrated as it requires licensing under the Protection of the Environment Operations Act (1997).

The site currently has a precast manufacturing facility, which (as the name suggests) manufactures precast concrete panels for the walling and flooring solutions industry. The current site regularly receives batches of ready-mix concrete via ready-mix concrete trucks, which travel on and off site. The operations on site works such that when the received batches of ready-mix concrete arrives, it is used immediately to manufacture the precast concrete panels and flooring materials, which then become final products that are exported off site.

The proposal is not a traditional concrete batching plant, as it will utilise twin centralised mixers for mixing various ratios of raw materials to produce various grades of ready-mix concrete, instead of using the typical concrete mixer trucks that are used to mix these materials during delivery. This will eliminate the need to clean and maintain concrete mixer trucks, as well as centralise all concrete mixing activities into one indoor area, which can effectively be managed.

The strength of this proposal is that it allows the current site to adapt best practice guidelines based on expertise and experience from Austral Precast, use of world's best technology (imported from Germany), and incorporate principles of cleaner production and ecological sustainability. The other strength is that environmental awareness of employees on site will be improved and emphasised, given the increase in degree of complexity to the operations of the site.

The proposed development is classified as designated development, as previously noted, under Schedule 3 of the Environmental Planning and Assessment Regulation, 2000 (EP&A) under the following definitions.

*19 Concrete works*

*"(1) Concrete works that produce pre-mixed concrete or concrete products and:*

*(a) that have an intended production capacity of more than 150 tonnes per day or 30,000 tonnes per year of concrete or concrete products, or*

*(b) that are located:*

*(i) within 100 metres of a natural waterbody or wetland, or*

*(ii) within 250 metres of a residential zone or dwelling not associated with the development.*

*(2) This clause does not apply to concrete works located on or adjacent to a construction site exclusively providing material to the development carried out on that site:*

*(a) for a period of less than 12 months, or*

*(b) for which the environmental impacts were previously assessed in an environmental impact statement prepared for that development.:"*

The proposed development is considered designated development under Item 14 (Concrete Works) of Schedule 3 based on the following criteria / conditions:

- An excess of 30,000 tonnes per year of concrete or concrete products will be produced on site;

The proposed development is integrated development as the site is to be a holder of an Environment Protection Licence under the Protection of the Environment Operations Act 1997Schedule 1, Part 1 – Premises based activities, the site operations are a scheduling activity under Clause 13 – Concrete Works.

*13 Concrete Works*

*(1) This clause applies to "concrete works", meaning the production of concrete products, but does not include the production of pre-mixed concrete (concrete batching)*

*(2) The activity to which this clause applies is declared to be a scheduled activity if it has a capacity to produce more than 30,000 tonnes per year of concrete products.*

An EPL application has been submitted. On approval of the expansion of the site a further application to vary the EPL would be submitted to DECCW.

Benbow Environmental was commissioned by Austral Precast to prepare the EIS to support the development application. This EIS addresses the requirements of the Department of Planning, Fairfield City Council, and Department of Environment Climate Change and Water.

The EIS facilitates the assessments of the environmental impacts considered necessary to be assessed for the proposed development and includes the following:

- Planning, legislative, regulatory considerations and traffic impacts, this was prepared by Rhodes Haskew & Associates;
- Visual impacts, this was prepared by Benbow Environmental and Algorry Zappia & Associates;
- Water emissions and assessment, this was prepared by Benbow Environmental;
- Noise emissions and assessment, this was prepared by Benbow Environmental;
- Air emissions and assessment, this was prepared by Benbow Environmental;
- Economic and social aspects, this was compiled by Benbow Environmental; and
- Ecological, greenhouse gas emissions and assessment, this was prepared by Benbow Environmental.

The EIS results in a compilation of environmental safeguards recommended for the proposed development.

Project Management of the EIS and design of the site was undertaken by Benbow Environmental.

A Statement of Commitments is provided as Section 8. The Statement of Commitments summarises the commitment made by the proponents to the environmental controls designed into the development. This statement bears the signatures of the proponents.

## 1.1 INTRODUCTION TO THE PROPONENT

The proponent is Austral Precast Pty Ltd. Austral Precast is part of the Brickworks family of companies which focuses on world class supply of precast concrete solutions for industrial, commercial, and residential construction.

Austral Precast has expanded its business scale and scope and have recently acquired three of the leading precast concrete manufacturers, which are Girotto Precast, Gocrete, and Sasso Precast Concrete. Girotto Precast is currently a precast concrete company based in Queensland and Victoria, Gocrete is a pre-mixed and precast concrete manufacturing business based in Western Australia, and Sasso Precast Concrete is a current precast concrete company based in Wetherill Park, NSW.

These businesses form a part of one of Australia's leading suppliers of building materials – Brickworks Limited.

## 1.2 BACKGROUND

Sasso Precast Concrete's Wetherill Park site has been established in early 1980's, and has originally operated solely with an expertise in providing industrial uses for precast concrete slabs.

A Statement of Environmental Effects (SEE) was prepared by Benbow Environmental for the subject site in 2005 for the expansion of their operations to both commercial and residential projects. This involved services ranging from simply providing products to a more full-service involvement such as drawing and design through to construction involvement.

A development application (DA No. 504/2001) was lodged with Fairfield City Council in 2001 for the construction of 4 warehouse units and the use of Unit 2 (the 2nd warehouse unit) for the manufacture of Precast Concrete Panels. The DA was approved on 11 July 2001. Environmental Audits of Australia (which is now under Benbow Environmental) has prepared a Fire Safety Study for this DA, to access the fire safety aspects and help provide compliance in accordance to the Building Code of Australia.

Since then, Sasso Precast Concrete became a part of Austral Precast family and, as a result, was given the ability and opportunity to expand and allow the site to generate its own pre-mixed (or ready-mix) concrete to feed its precast concrete manufacturing facility. This would allow the current precast concrete facility to produce up to 60,000 $m^3$ per year (~150,000 tonnes p.a.) of precast concrete products.

The success of this development and its compliance to the relevant statutory approvals and guidelines depend on the management of the project. The following stages were conducted in order to achieve this:

- Austral Precast determined available options for the location of the proposed concrete batching plant, given that there is ample room on the subject site;
- Austral Precast analysed potential suppliers of the equipment;
- Austral Precast discuss with Algarry Zappia and Benbow Environmental the various locations on site that are available, the advantages and disadvantages;
- Present the options to Fairfield City Council through a pre-DA meeting and determine any other environmental aspects that are of concern to Council;
- Understanding any constraints present with the current design, and determining room for opportunities and improvements;
- Present solutions to Fairfield City Council through correspondences with Mr. Nelson Mu to resolve any environmental issues;
- Consultation with the Department of Environment, Climate Change and Water (DECCW) to determine their concerns of environmental impacts from the proposed concrete batching plant. The meeting held along with the proponent and key consultants provided outcomes that are discussed in this EIS; and
- The completion of the EIS.

## 1.3 PROJECT OUTLINE

This section of the EIS outlines the project. This includes the objectives of the project, the need for the project, purposes of the EIS, structure of the document, and statutory requirements.

### 1.3.1 Objectives of the Proposal

The purpose of this development is simply as follows:

- Construction of a Concrete Products Batching Plant to be integrated to an existing Precast Concrete Manufacturing Facility. Production capacity of up to 60,000 $m^3$ per year is envisaged.

- Inclusion of a closed loop concrete recycling process enabling aggregates to be washed and reused on site, and slurry to be stored and also reused on site.

- Modifications to the existing precast concrete facility to allow receipt of the ready-mix concrete from the proposed concrete batching plant.

- Enable concrete production on site to streamline the precast manufacturing processes.

  At present delivery of ready mixed concrete is by truck mounted mixers. These are unloaded into skips which are transferred inside the precast manufacturing building up to the start of the production line. The transfer of the concrete is a batching process and does not always co-ordinate with the precast panels manufacturing lines. A delay in arrival of a concrete truck due to traffic can disrupt the production process.

  Hence, an on site plant with twin mixers will enable the continuous production of concrete of a very high quality.

- Select a process that provides for several days of raw material storage.

- Select a plant design that enables the plant to be enclosed and roofed.

- Integrate a waste concrete recycling process that thoroughly cleans and dewaters the aggregate and separates the water / fines.

- Enable the water / fines to be stored as a slurry in an enclosed area of the plant, in a tank fitted with a stirrer and the tank located in bunded area. The aggregate and the fines / water mixture are able to be reused in production avoiding the environmental problems of holding wet waste concrete mixture in a skip or waste bin on site.

- Incorporate where economically practical to do so the principles of ESD into the project.

The concrete plant is solely for production of concrete that will be used on site. There will be no external supply of ready mixed concrete from this plant.

### 1.3.2 Need for the Project

The proposal is needed by the proponents to efficiently allow the existing precast concrete facility to continuously produce on site concrete and increase the production of precast concrete panels to 150,000 tonnes per annum.

The proponent currently has the expertise to provide the design for the concrete batching plant, which have been sourced internationally to introduce principles of efficiency (time and cost-wise based on modern technology). The design inherently has introduced principles of cleaner production and sustainability, and has, given the intent of the proposal, applied principles of ecologically sustainable development.

### 1.3.3 Purposes of the EIS

The purpose of this EIS is to document the existing environment and assess the potential environmental impacts from the proposal.

The EIS process for the proposed site has developed the constraints on the development and the engineered controls needed to achieve compliance with the criteria that have been applied.

The purpose of the EIS is also to provide the consent authority, the community, government authorities, and the applicant with sufficient information to make informed decisions in relation to the proposed development.

The consent authority is the Fairfield City Council. The site is currently an existing industrial facility, manufacturing precast concrete panels. The site will be similar to any of the industrial premises residing within the Wetherill Park Industrial Estate, which would have equal or larger capacities compared to the proposal's production capacity. Its development to allow the construction of its proposed concrete products batching plant (along with its ancillary activities) is enabled by the EIS.

### 1.3.4 Structure of the EIS

The EIS is organised into the following three main sections:

- Executive Summary
  This summarises the proposed development, justification and the environmental assessment of the proposal.

- Main Contents of the EIS
  The main contents of the EIS describe the development in detail, the environmental assessment of the issues, the impacts, and safeguard measures.

- Appendices and Attachments
  The appendices and attachments contain the requirements of the Director General of the Department of Planning, and technical support documents.

### 1.3.5 Statutory Requirements

The statutory requirements to be satisfied are contained within the following legislation.

- Environmental Planning and Assessment Act 1979 and the associated Environmental Planning Instruments and Regulations.
- Protection of the Environment Operations Act 1997 and Schedule 1, Part 1 – Scheduled Activities applies.

The report also addresses the Director General's Requirements (DGR Reference No. 10/20821) relating to applicable environmental planning instruments that apply to the site.

In accordance with Clause 73 of the EP&A Regulation, 2000, the Director General's Requirements for the preparation of an EIS for the proposed development were obtained.

The key environmental planning issues that were raised in these requirements included the following:

- Assessment of the development against relevant legislation and environmental planning instruments;
- Noise impacts during construction, operation and traffic noise contributions;
- Air quality impacts including odour and dust;
- Soils and water management including impacts on surface water, stormwater management, wastewater management and flooding;
- Traffic and transport management;
- Hazards and risks in accordance with the State Environmental Planning Policy No. 33;
- Fire and incident management;
- Heritage, including Aboriginal; and
- Ecological (flora and fauna) assessment.

A copy of the Form A application submitted to the Department of Planning to request a copy of the Director General's requirements have been provided as Attachment 1. A copy of the Director General's Requirements has been included as Attachment 2 to the EIS. All the requirements of the Director General have been considered in the preparation of the EIS.

The Statement of Compliance is listed in Table 2-3 of Section 2.3.6. This table lists the section and page where requested information has been provided.

## 1.4 DEVELOPMENT ALTERNATIVES

This section of the EIS discusses alternatives to the development in regard to both the site and proposed methods of operation. The criteria for selection are firstly discussed.

### 1.4.1 Criteria for Selection

The proposal depends on the following being available:

- Ample room for the storage and transfer of raw materials required to produce concrete. Raw materials needed to be stored include sand, aggregates, cement, and other cementitious materials such as fly ash and in the future potentially ecoslag. Minor quantities of chemical additives would be stored. None of these are classified as dangerous goods;
- Location that is adjacent to the precast concrete manufacturing buildings at the Wetherill Park site, helping minimise energy required for transfer of materials and reducing potential for air emissions due to immediate transfer and enclosures;
- The development is suitably away from urban and suburban areas;
- On land that has long term development opportunities;
- On land free of encumbrances such as presence of contamination issues;
- On land sufficiently cleared of native vegetation and heritage land or items (including Aboriginal), and non-environmentally sensitive; and
- On land suited to environmental noise control.

The land and location of the proposed site meets the selection criteria and was selected for the location of the proposal.

Dependent on the success of the development is the entry and exit of trucks delivering the raw materials and in particular aggregates and sand.

The delivery of these materials is either by tipper and dog trailer or semi-trailer. An internal route is needed that avoids reversing of these trucks to position the truck over the ground hopper that in turn transfers the material to the above ground storage bins.

Where ever the plant would be located on site truck movements are required in such a way that access to the rest of the site is not blocked. Hence the proposal includes a single way access adjacent to the existing driveway. A ramp down to the ground hopper, used several times daily, resolves the issue of on site traffic congestion, avoids creating a safety issue and ensures the site's production efficiencies will be maintained and further improved as a result of the development.

The approval of this ramp is a critical issue for the future development of the site.

### 1.4.2 Alternative Sites

Alternative sites were not researched prior to the preparation of this EIS as the site was already owned by the proponents.

However, two (2) possible locations within the subject site boundary had been considered during the design stage of the concrete batching plant. These possible locations were presented in the pre-DA meeting with Fairfield City Council. These possible locations are presented in Figure 1-1.

The selected location is the location marked in Figure 1-1 marked as "possibility 2 for batch plant" given that concerns for the height of the proposed batching plant to reach the height of the existing power lines that run through the southern boundary of the site.

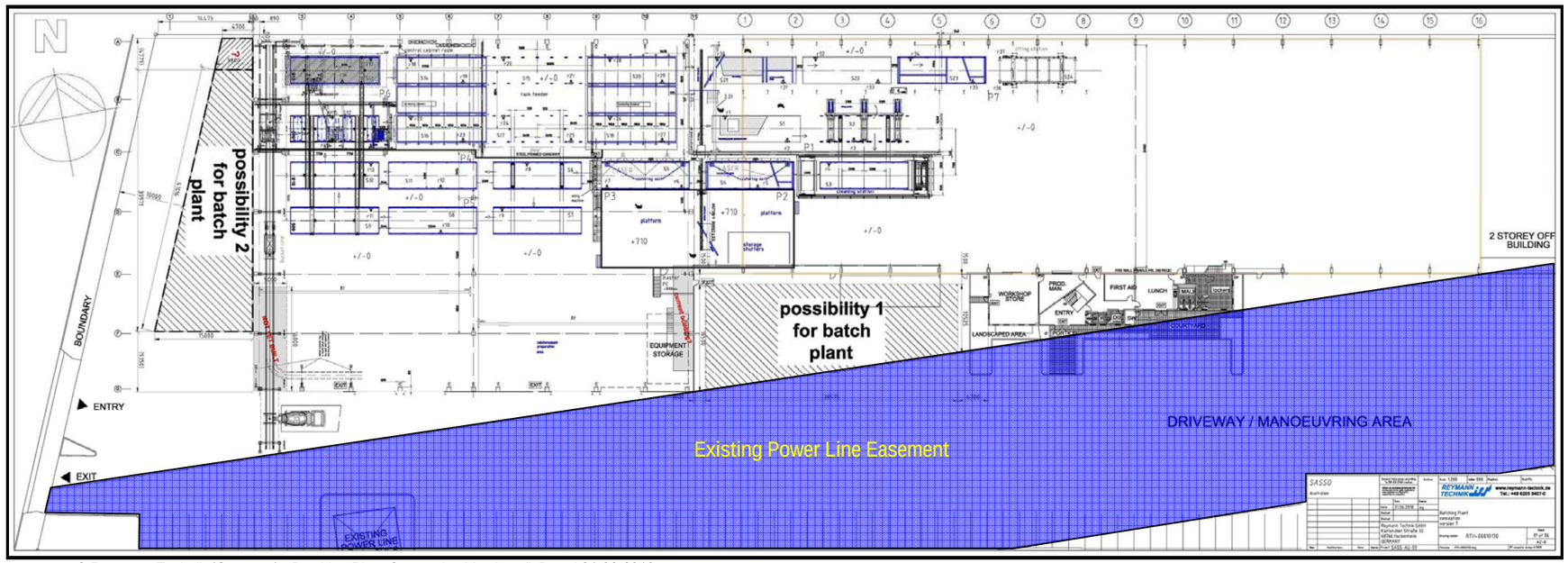
### 1.4.3 Alternative Design and Methods

There are alternative methods available for the manufacture and processing of relevant raw materials to produce concrete on site. These include the following:

- Erect a ready mixed concrete batching plant at the rear of the site and transfer the concrete up to the front of the site using truck mounted mixers. This method would generate safety problems and be economically unviable.

- Bring dry premixed batches of the materials that are converted to concrete by the addition of water and chemical additives. These premixed batches would be brought to the site from elsewhere in bulky bags. These would be stored and emptied directly into the mixers. Although this method sounds as if it has advantages the economies cause it to fail. Hence the solution chosen is the most efficient to protect the productive capacity of the site,

Figure 1-1: Sketch Showing Two Possible Locations for the Concrete Batching Plant




Source: © Reymann Technik (Germany), "Batching Plant Conception Version 7", Dated 21-06-2010.
Note: Existing power line easement is shaded as shown in the diagram above.

## 1.5 LICENCES AND APPROVALS

The site would be required to modify the Environment Protection Licence (EPL) by the DECCW on the development receiving consent.

As the production capacity is or has reached the quantity requiring an EPL to be held, an application for an EPL has been submitted to DECCW.

## 1.6 IDENTIFICATION AND PRIORITISATION OF ISSUES

As noted in the Executive Summary, the identification and prioritisation of the potential environmental impacts of the proposed development was a fundamental step in preparing the EIS.

This process involved the following stages:

- Ecological (flora and fauna) assessment;
- Noise impact assessment;
- Groundwater,
- Air quality;
- Planning requirements;
- Assessment of local Council requirements;
- Assessment of requirements for the EIS from DoP and DECCW, and
- Visibility.

These steps led to the design of the proposal and the interlocking facets outlined in the Objectives of the Proposal.

The statutory requirements and government guidelines in conjunction with the government consultation process confirmed the presence of issues including:

- Construction and operational noise;
- Air quality;
- Visibility;
- Groundwater,
- Traffic;
- Internal roadways; and
- Sediment control during construction;

# 2. DEVELOPMENT ISSUES

## 2.1 PLANNING

### 2.1.1 Introduction

Rhodes Haskew Associates has been engaged by Benbow Environmental to prepare a town planning assessment and traffic assessment of a Development Application for a concrete batching plant as use of the site additional to an existing precast concrete manufacturing facility. The land to which the application relates is Lot 79 DP 27515, being land commonly known as 31-41 Cowpasture Road, Wetherill Park.

The Town Planning component of the Report addresses all statutory controls contained within the Environmental Planning and Assessment Act 1979 and associated Environmental Planning Instruments and Regulations.

The Traffic Impact Assessment of the proposed development provides an assessment of the proposed development in accordance with the RTA's Guide to Traffic Generating Developments.

Designated Development

Pursuant to Item 14 of Schedule 3 of the Environmental Planning and Assessment Regulation 2000, the proposed development is designated development in that it involves concrete works having a production capacity of more than 150 tonnes per day or 30,000 tonnes per year of concrete or concrete products. Accordingly, the proposed development is identified as Designated Development.

Integrated Development

The proposed use is identified within Schedule 1 of POEO Act 1997and accordingly a Scheduled Activities Licence is required and the proposed development is Integrated Development.

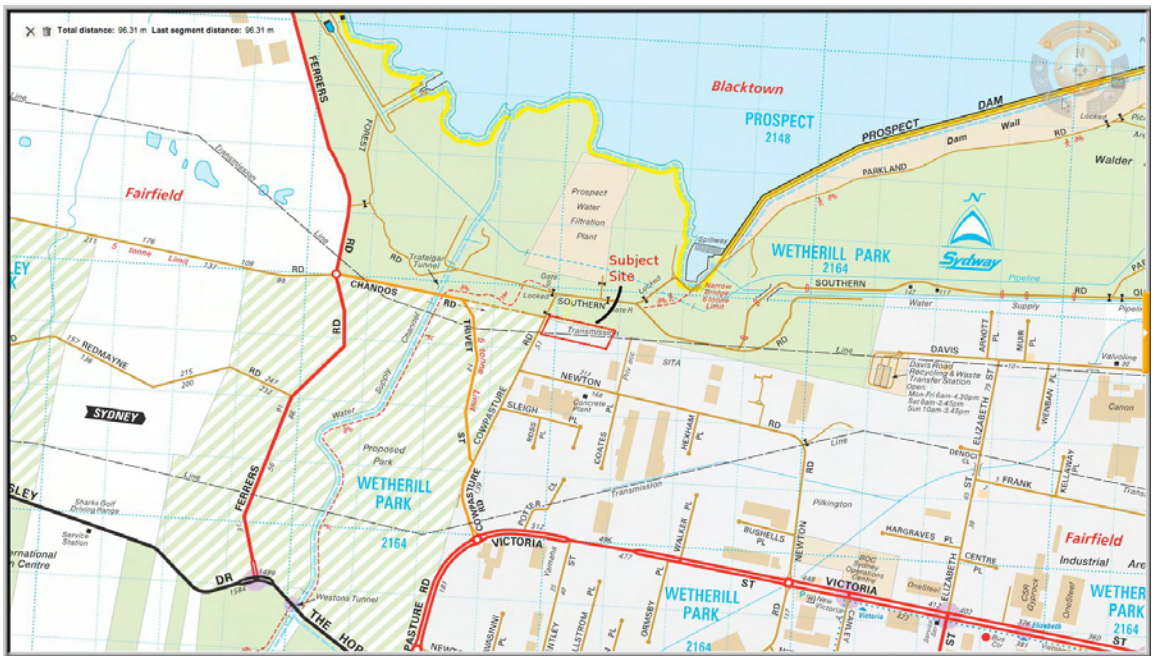
Local Development

The proposed development is Local Development and Fairfield City Council is the consent authority.

### 2.1.2 Site Details

The subject site is situated on the eastern side of Cowpasture Road, approximately 160m north of Newton Road, Wetherill Park. The site's location is shown in the Neighbourhood Context as Figure 2-1. An aerial photograph describing the Local Context is provided as Figure 2-2, whilst a detailed Site View is provided as Figure 2-3.

Figure 2-1: Site Location (Neighbourhood Context)




Source: © Department of Lands Website

Figure 2-2: Aerial Photograph – Local Context


Source: © Google Maps

Figure 2-3: Aerial Photograph – Detailed Site View


Source: © Nearmap.com

#### 2.1.2.1 Site Description

The subject site is described at Lot 79 DP 27515 and is commonly known as 33-41 Cowpasture Road, Wetherill Park. The site is trapezoidal in shape, having frontage to Cowpasture Road of approximately 80.2m and a depth of approximately 265m. Total site area is approximately 2.08ha.

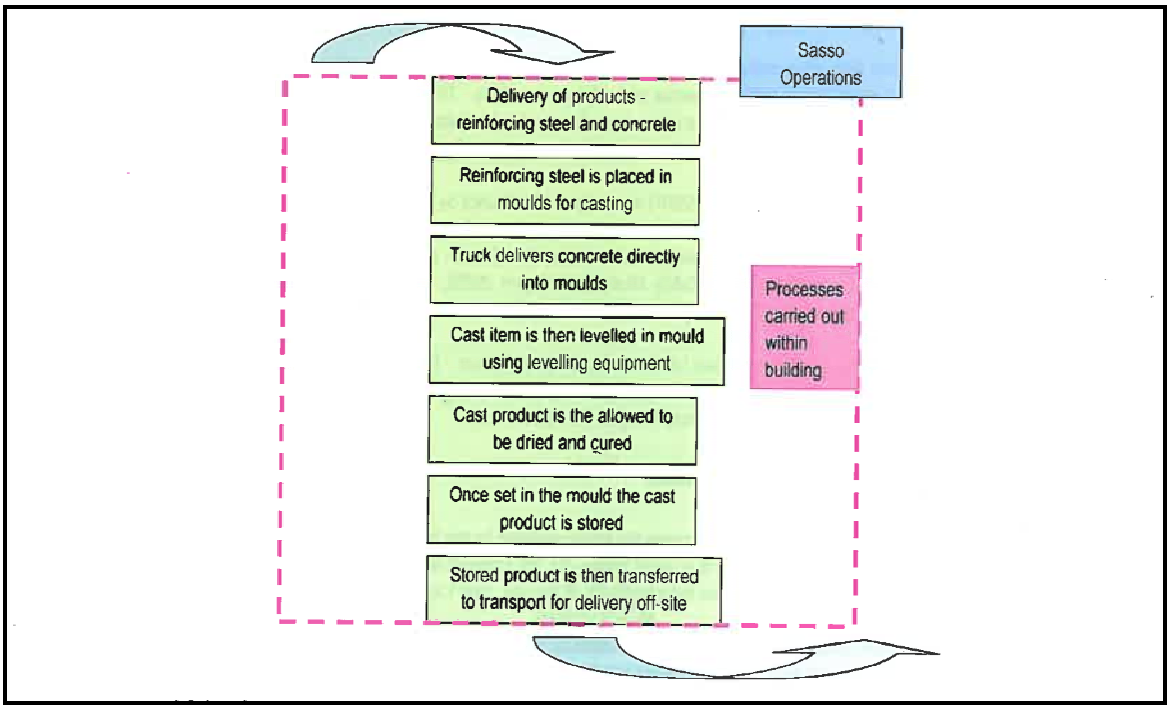
#### 2.1.2.2 Existing Development

Existing on the site is an industrial unit development comprising 3 industrial units with approval for a smaller sized, fourth unit which has yet to be constructed. We are advised that the existing units have not been strata subdivided. Each of the existing units is occupied by Sasso Precast Concrete Pty Ltd and each unit is used to house a different component of the business' production process. In this regard:

- Unit 1 is used for the production of precast concrete panels;
- Units 2 and 3 are used for storage; and
- Unit 4 has been approved as part of DA504/2001 but is yet to be constructed.

Existing manufacturing processes have been described by Benbow Environmental in their Statement of Environmental Effects dated 14 February 2006 for alterations and additions to the then existing facility. The following diagrammatic flow-chart summary of production processes appears at Page 2 of their report as follows:

Figure 2-4: Diagrammatic Flowchart of Existing Site Operations




Source: Dick Benbow and Associated – 2006, p2.

### 2.1.2.3 Surrounding Development

The site is situated at the north western extremity of the Wetherill Park Industrial area. Adjoining to the north is Prospect Reservoir and water filtration plant. Adjoining to the west is unzoned land used for rural and rural residential purposes. The nearest dwelling house to the subject site is to the south west and is 314 m distant from the site.

Adjoining to the south and east are industrial uses.

### 2.1.2.4 Topography and drainage

The site slopes gently from east to west and stormwater is drained to Cowpasture Road. Details of proposed stormwater management, including fire water containment are addressed in detail within the EIS.

### 2.1.2.5 Vegetation

The site does not contain any significant vegetation.

#### 2.1.2.6 Zoning

The Subject Site is zoned 4(a) General Industrial Zone pursuant to the provisions of Fairfield Local Environmental Plan 1994. A detailed assessment of the proposed development in accordance with existing zoning controls is provided at Section 4.1 of this report.

### 2.1.3 Development Control Plans

The subject site is affected by the provisions of Fairfield City Wide DCP 2006 (FCWDCP 2006). Detailed assessment of the proposed development in accordance with FCWDCP 2006 is undertaken at Section 4.3 of this report.

## 2.2 PROPOSED DEVELOPMENT

The proposed development seeks to add to the approved uses of the site by the addition of concrete batching operations. In this regard, the development provides for vertical expansion of existing operations so that ready mixed concrete, being the raw material for precast concrete panel production, is produced on site, rather than purchased from third party suppliers.

In terms of built form, the additional use will involve the erection of two banks of silos, which will be attached to the front (western) elevation of the existing building.

Movement of product between the silos and Unit 1 will be facilitated by openings in the front elevation of Unit 1 to accommodate inclined conveyors. Adjacent the northern silo bank, a 3.25m lean-to building is proposed to facilitate first floor production as well as ground floor production and storage.

The proposed development also involves the erection of a water treatment plant, which is required to treat wastewater from ready mix concrete production.

The concrete batching operations are estimated to produce 60,000$m^3$ of ready mix concrete per annum.

The proposal involves increasing the existing hours of operation from 8 hours by five days per week to a two shift operation of 16 hours by five days per week on a regular basis. As a result, the proposal also involves an increase in employment by 14 people from 54 to 68. Approval is requested for night time operation of the production facilities at site although this would not be a routine requirement.

## 2.3 STATUTORY CONTROLS

Compliance with most applicable statutory controls have been prepared as part of the planning assessment conducted by Rhodes Haskew and Associates. Details are provided as follows.

### 2.3.1 Fairfield Local Environmental Plan 1994

The aims and objectives of the Fairfield Local Environmental Plan 1994 (FLEP 1994) are set out at Clause 2 as follows:

*The aims and objectives of this plan are:*

*(a) to repeal all the existing local planning controls, and to replace these controls with a single local environmental plan,*

*(b) to give the Council of the City of Fairfield greater responsibility for environmental planning by including broad controls in this plan and more detailed controls in the development control plans prepared by the Council,*

*(c) to conserve, improve or safeguard the existing environmental qualities of the City of Fairfield,*

*(d) to provide sufficient land for a range of land uses to accommodate:*

*(i) differing lifestyles, incomes and cultures,*
*(ii) economic and employment opportunities for the benefit of business and residents,*
*(iii) a wide range of affordable quality housing, and*
*(iv) public services and facilities that are well located and responsive to the needs of the community,*

*(e) to require the provision of services and facilities when development occurs pursuant to a development consent,*

*(f) to restrict development on land adversely affected by natural or manmade hazards, and*

*(g) to conserve the environmental heritage of the City of Fairfield.*

The proposed development is considered to be consistent with the above aims and objectives.

The subject site is zoned 4(a) – General Industrial pursuant to the provisions of Fairfield Local Environmental Plan 1994 (FLEP 1994). The objectives of the zone are:

*(a) to encourage the establishment of a broad range of industrial and allied uses which will generate employment and contribute to the economic development of the City of Fairfield,*

*(b) to allow community uses to serve the needs of the local industrial work force, and*

*(c) to allow retail development only:*

*(i) where associated with, and ancillary to, industrial purposes on the same land,*
*(ii) where it primarily serves the daily convenience needs of the local industrial work force, or*
*(iii) for motor orientated activities (that is, the use of a building or place associated with, and ancillary to, industrial purposes on the same land for the sale by retail of motor vehicle components or goods but not the use of a building or place elsewhere defined in this plan), and only if the proposed development will not detrimentally affect the viability of any nearby business centre.*

The proposed development is considered to be consistent with Objective (a).

The development is defined as an "industry" pursuant to the definition of the same contained within the Dictionary to FLEP 1994. Industries are permissible with consent.

The proposed development is consistent with all relevant provisions of FLEP 1994.

### 2.3.2 Greater Metropolitan Regional Environmental Plan No. 2 - Georges River Catchment

The aims and objectives of GMREP No. 2 are set out at Clause 5 follows:

*5 Aims and objectives*

*(1) The general aims and objectives of this plan are as follows:*

*(a) to maintain and improve the water quality and river flows of the Georges River and its tributaries and ensure that development is managed in a manner that is in keeping with the national, State, regional and local significance of the Catchment,*

*(b) to protect and enhance the environmental quality of the Catchment for the benefit of all users through the management and use of the resources in the Catchment in an ecologically sustainable manner,*

*(c) to ensure consistency with local environmental plans and also in the delivery of the principles of ecologically sustainable development in the assessment of development within the Catchment where there is potential to impact adversely on groundwater and on the water quality and river flows within the Georges River or its tributaries,*

*(d) to establish a consistent and coordinated approach to environmental planning and assessment for land along the Georges River and its tributaries and to promote integrated catchment management policies and programs in the planning and management of the Catchment,*

*(e) (Repealed)*

*(f) to provide a mechanism that assists in achieving the water quality objectives and river flow objectives agreed under the Water Reform Package.*

*(2) The specific aims and objectives of this plan are as follows:*

*Environmental protection and water quality and river flows*

*(a) to preserve and protect and to encourage the restoration or rehabilitation of regionally significant sensitive natural environments such as wetlands (including mangroves, saltmarsh and seagrass areas), bushland and open space corridors within the Catchment, by identifying environmentally sensitive areas and providing for appropriate land use planning and development controls,*

*(b) to preserve, enhance and protect the freshwater and estuarine ecosystems within the Catchment by providing appropriate development,*

*(c) to ensure that development achieves the environmental objectives for the Catchment.*

*Regional role and land use*

*(a) to identify land uses in the Catchment which have the potential to impact adversely on the water quality and river flows in the Georges River and its tributaries and to provide appropriate planning controls aimed at reducing adverse impacts on the water quality and river flows,*

*(b) to conserve, manage and improve the aquatic environment within the Catchment which is a significant resource base for the aquaculture industry, by providing controls aimed at reducing pollution entering the*

*Catchment's watercourses,*

*(c) to protect the safety and well being of the local and regional community in accordance with standards and processes aimed at improving the water quality and river flows in the Catchment to enable recreation,*

*(d) to aid in the improvement of the environmental quality of Botany Bay in conjunction with other regional planning instruments.*

The proposed development is considered to be consistent with the above aims.

The "*General Principals"* to be considered in the assessment of a Development Application are provided at Clause 8 as follows:

*8 General principles*

*When this Part applies the following must be taken into account:*

*(a) the aims, objectives and planning principles of this plan,*

*(b) the likely effect of the proposed plan, development or activity on adjacent or downstream local government areas,*

*(c) the cumulative impact of the proposed development or activity on the Georges River or its tributaries,*

*(d) any relevant plans of management including any River and Water Management Plans approved by the Minister for Environment and the Minister for Land and Water Conservation and best practice guidelines approved by the Department of Urban Affairs and Planning (all of which are available from the respective offices of those Departments),*

*(e) the Georges River Catchment Regional Planning Strategy (prepared by, and available from the offices of, the Department of Urban Affairs and Planning),*

*(f) all relevant State Government policies, manuals and guidelines of which the council, consent authority, public authority or person has notice,*
*(g) whether there are any feasible alternatives to the development or other proposal concerned.*

The EIS details water protection measures including fire water containment and stormwater quality control, which is to be employed by the proposed development to ensure the proposal will result in negligible impact on adjacent or downstream local government areas, the Georges River or its tributaries. The proposed development does require applicable plans of management for the Georges River Catchment or the Regional Planning Strategy. The proposed development is also considered to be consistent with all relevant State Government policies, manuals and guidelines and accordingly, the proposal is consistent with the General Principals set out within GMREP 2.

Specific Planning Principals are set out at Clause 9. The following provides a comment in relation to each principal.

*9 Specific planning principles*
*When this Part applies, the following must be taken into account:*

*(1) Acid sulfate soils*

*Disturbance of acid sulfate soil areas is to be avoided or minimised and those areas are to be protected in accordance with the requirements set out in the Acid Sulfate Soils Assessment and Management Guidelines prepared by the Acid Sulfate Soils Management Advisory Committee. Measures to minimise that disturbance are to take into account the following:*

*(a) verification of the existence, locations and extent of acid sulfate soils,*

*(b) the capacity of land to sustain the proposed land uses, having regard to:*

*(i) potential impacts on surface and groundwater quality and quantity, and*

*(ii) potential impacts on ecosystems and on biodiversity, and*

*(iii) potential impacts on agricultural, fisheries and aquaculture productivity, and*

*(iv) any likely engineering constraints and impacts on infrastructure, and*

*(v) cumulative environmental impacts.*

Comment: There is no evidence to suggest that the site contains acid sulfate soils.

*(2) Bank disturbance*

*Disturbance of the bank or foreshore along the Georges River and its tributaries is to be avoided and those areas and any adjoining open space or vegetated buffer area must be protected from degradation.*

Comment: The proposed development will not result in any bank disturbance.

*(3) Flooding*

*The following are to be recognised:*

*(a) the benefits of periodic flooding to wetland and other riverine ecosystems,*

*(b) the pollution hazard posed by development on flood liable land in the event of a flood,*

*(c) the cumulative environmental effect of development on the behaviour of flood water and the importance of not filling flood prone land.*

Comment: The subject site is not affected by flooding.

*4) Industrial discharges*

*The discharging of industrial waste into the Georges River or its tributaries must be avoided and the requirements of the relevant consent authority and licensing authority must be met in those instances where industrial discharges into the river and its tributaries occur.*

Comment: The EIS details measures to be taken by the proposed development to minimise industrial discharges and to ensure that environmental impact is acceptable.

*(5) Land degradation*

*Land degradation processes, such as:*

*(a) erosion,*

*(b) sedimentation,*

*(c) deterioration of soil structure,*

*(d) significant loss of native vegetation,*

*(e) pollution of ground or surface water,*

*(f) soil salinity and acidity, and*

*(g) adverse effects on habitats and sensitive natural environments (aquatic and terrestrial) within the Catchment,*

*must be avoided where possible, and minimised where avoidance is not possible.*

Comment: The proposed development is unlikely to result in any land degradation.

*(6) On-site sewage management*

*The potential adverse environmental and health impact associated with effluent disposal is to be recognised and guarded against by meeting the criteria set out in the Environment Health Protection Guidelines: On-site Sewage Management for single households and the provisions of the Local Government (Approvals) Regulation 1993.*

Comment: The proposed development does not involve on-site sewer management.

*(7) River-related uses*

*Uses located on immediate foreshore land on the Georges River and its tributaries must be water-related and public access to the foreshore of the river and its tributaries must be provided in order to enhance the environment of the Catchment.*

Comment: The proposed development does not involve river related uses.

*(8) Sewer overflows*

*The adverse impact of sewer overflows, including exfiltration, on the environment within the Catchment, and specifically on the water quality of the river and its tributaries, is to be recognised and that issue is to be addressed through appropriate planning and management of development within the Catchment.*

Comment: The proposed development does not increase the risk of sewer overflow.

*(9) Urban/stormwater runoff*

*The impacts of stormwater runoff, including sewage contaminated runoff into or near streams within the Catchment, is to be minimised and mitigation measures that address urban stormwater runoff are to be implemented in accordance with the local council requirements and the Managing Urban Stormwater series of documents. Development is also to be in accordance with the NSW State Rivers and Estuaries Policy available from offices of the Department of Urban Affairs and Planning. Stormwater management must be integrated so that quality, quantity and land use aspects are all encompassed.*

Comment: The EIS details urban/stormwater runoff control measures and it is considered that the proposed development is consistent with the Blue Book series.

*(10) Urban development areas*

*The environment within the Catchment is to be protected by ensuring that new or expanding urban development areas are developed in accordance with the Urban Development Program and the Metropolitan Strategy and that the requirements of the NSW Floodplain Development Policy and Manual (prepared by and available from the Department of Land and Water Conservation) are also satisfied. It is important to ensure that the level of nutrients entering the waterways and creeks is not increased by the development.*

Comment: Not relevant to the proposed development.

*(11) Vegetated buffer areas*

*Appropriate buffer widths (as identified in item 21 relating to Development in Vegetated Buffer Areas in the Planning Control Table in Part 3) must be retained as a means of improving surface runoff entering into the Georges River or its tributaries.*

Comment: The subject site is not situated in vegetated buffer areas.

*(12) Water quality and river flows*

*Water quality and river flows within the Catchment are to be improved through the implementation of environmental objectives for water quality and river flows agreed between the Minister for Environment and the Minister for Land and Water Conservation and by the application of consistent decisions affecting the use and management of land.*

Comment: The proposed development is unlikely to result in any adverse impact on water quality or river flows.

*(13) Wetlands*

*Wetlands must be protected through the application of consistent land use and management decisions that take into account the potential impact of surrounding land uses, incorporate measures to mitigate adverse effects and are in accordance with the NSW Wetlands Management Policy (prepared by and available from the Department of Land and Water Conservation). Wetlands must also be protected by requiring adequate provisions where clearing, construction of a levee, draining or landscaping is to be undertaken.*

Comment: The subject site does not contain wetlands.

Part 3, Clause 11 of GMREP 2 provides a Planning Control and Consultation table. The proposed development falls within Item 9, Industry and the following controls are applicable.

*9 INDUSTRY*

*Definition*

*The manufacturing, assembling, altering, repairing, renovating, ornamenting, finishing, cleaning, washing, dismantling, processing or adapting of any goods or articles for commercial purposes (other than development defined elsewhere in this table).*

*Planning controls*

*Development consent required.*
*Advertised unless involving minor works such as refurbishment, refitting and the like or involving an occupation that is a light industrial activity, in which case not advertised development.*

*Specific matters for consideration*

- *The potential cumulative environmental impact of any industrial uses on water quality within the Catchment.*
- *The adequacy of proposed stormwater controls and whether the proposal meets the Council's requirements for stormwater management.*
- *Whether proposed erosion control measures meet the criteria set out in Managing Urban Stormwater: Soil and Construction Handbook (1998) prepared by and available from Landcom and the Department of Housing.*
- *Likely impact on groundwater and remnant vegetation.*
- *The possibility of reusing treated waste water on land and the adequacy of proposed waste water disposal options.*
- *Whether adequate provision has been made to incorporate vegetated buffer areas to protect watercourses, foreshores or other environmentally sensitive areas where new development is proposed.*
- *The adequacy of planned waste water disposal options.*

The proposed development is advertised development. In relation to the specific matters for considerations we note the following:

- The proposed development is unlikely to result in any unreasonable cumulative environmental impacts within the catchment.
- The proposed stormwater controls are set out in details within the EIS and are considered to be adequate and consistent with Council requirements.
- Erosion and sediment control measures are detailed within the EIS and are considered to be consistent with the Blue Book.
- The proposed development is unlikely to result in any impacts on groundwater or remnant vegetation.
- The application proposes a two stage wastewater treatment system which is detailed within the EIS. The proposed development will involve minimal waste water and no waste water discharges from the site.
- The proposed development does not require the incorporation of vegetated buffer areas.
- The proposed development involves almost total industrial waste water recycling. Sewerage is proposed to be discharged to the sewer.

### 2.3.3 Fairfield City Wide Development Plan

The proposed development has been assessed in accordance with the provisions of FCWDCP and the following table provides a summary of compliance.

Table 2-1: Summary of Compliance with Fairfield City Wide Development Control Plan

| Standard (Clause) | Required | Provided | Complies? |
|---|---|---|---|
| **Chapter 3 – Environmental Site Analysis** | | | |
| Flood Risk Assessment (3.1.1) | Various controls applying to flood liable land. | The subject site is not flood affected. | Yes. |
| Land Contamination (3.1.2) | Various controls relating to contamination identification and remediation. | The subject site is not identified as potentially contaminated. | Yes. |
| Acid Sulphate Soils (3.1.3) | Various controls relating to management of acid sulphate soils during the construction phase of developments. | The subject site is not identified as containing acid sulphate soils. | Yes. |
| Threatened Species (3.1.4) | Various controls relating to the protection and management of threatened species and ecological communities. | There are no threatened species on the site. | Yes. |
| Trees and Bushland | Sets out the requirements of Council's Tree Preservation Order and other vegetation management controls. | The proposed development does not involve any impact on existing vegetation. | Yes. |

| Table 2-1: Summary of Compliance with Fairfield City Wide Development Control Plan | | | |
|---|---|---|---|
| Standard (Clause) | Required | Provided | Complies? |
| Local Context Analysis (3.2) | Sets out the requirements for local context analysis to be included in a development application. | See commentary at the end of this table of this report for detailed local context analysis. | Yes. |
| Chapter 9 – Industrial Development | | | |
| Site Dimensions (9.1) | Various controls relating to consolidation of allotments, minimum frontage, and minimum lot size for subdivision. | The subject site satisfies all site dimension criteria. | Yes |
| Setbacks (9.2) | 10m, all of which is to be landscaped. | 10m setback provided, all of which is landscaped | Yes |
| Car Parking, Vehicle and Access Management (9.3) | Car parking to be provided pursuant to Chapter 12. | See Section 5.6 of this subsection of the EIS in relation to parking assessment. | Yes |
| Loading Facilities | 1 space per 700sqm GLA | Loading facilities associated with the existing development are as approved. The proposed development involves truck access to the new silos. Loading areas have been indicated as per the proposed site layout. | Yes |
| On-site manoeuvring | Design must accommodate forward direction ingress and egress by a large rigid truck. | Forward direction ingress and egress accommodated. | Yes |
| Streetscape and amenity | Decorative paving adds | The proposed | Yes |

| Table 2-1: Summary of Compliance with Fairfield City Wide Development Control Plan | | | |
|---|---|---|---|
| Standard (Clause) | Required | Provided | Complies? |
| (9.5) | interest to large areas of hard paving.<br><br>Open car parking areas should be landscaped to reduce the impact of hard paving. | development does not involve any additional paving or off street parking. | |
| | New buildings to be harmonious in forms and style with existing and intended development. | The proposed development provides a satisfactory streetscape presentation and the visual relationship to adjoining development is acceptable. | Yes |
| | Hours of operation to be from 7am to 6pm Monday to Friday and 7am to 12 noon on Saturdays. Proposals to operate outside of these hours to be considered on their merits | Proposed hours of operation are 24 hours per day, 5 days per week. The impacts of extended operating hours are addressed in detail within the EIS. The merits of the proposed operating hours are considered satisfactory. | Yes |

### 2.3.3.1 Local Context Analysis

#### Regional Context

*Information which describes where the site of the proposed development is located, the surrounding region and some of its characteristics. In general terms development within Fairfield City will concentrate on where this development is located in relation to Parramatta CBD, Regional Centres with the Fairfield CBD, significant employment areas and strategic decision-making as described by the new metropolitan strategy. This information provides the baseline data from which to coordinate more detailed information.*

The subject site is situated at the north western extremity of the Wetherill Park Industrial Estate. Wetherill Park is the largest single industrial area within the Southern Hemisphere[1]. It is situated approximately 11km west, southwest of the Parramatta CBD and 30km west of the Sydney CBD. Together with Smithfield, Yennora and Fairfield East, Wetherill Park forms the most significant part of an Employment Lands belt. Wetherill Park occupies approximately 600ha of land, accommodates all industrial land use types but features are more prevalent supply of light manufacturing, as well as freight and logistics companies.

#### Urban Form

*A general description of the buildings, landscapes and the spaces within a local area. General information to document includes open space networks, schools, entertainment areas, social facilities etc. This information enables an assessment of the existing character of the local area so as to guide the future shape and scale of the proposed development.*

Lots sizes within the vicinity of the site are widely disparate, ranging from more than 2ha to less than 1400sqm. Existing buildings are generally of concrete panel construction with most dating back to the 1970s and 80s. In this north western end of Wetherill Park, road pavement width is relatively narrow, by industrial estate standards, being only approximately 12.8. This generally accommodates one through lane of traffic and one lane of parking in each direction.

The primary retail area servicing Wetherill Park is Greenway Plaza, situated on the north west corner of the intersection of The Horsley Drive and Elizabeth Street, being some 2km south east of the subject site. There are no public open spaces, excluding Wetherill Park to the south east of the industrial estate, however there are several gymnasiums, restaurants and clubs and take-away food premises which service the needs of the industrial workforce.

[1] *Source: http://en.wikipedia.org/wiki/wetherill_park,new_south_wales*

## Existing Buildings and Uses

*Provides more detail on the immediate development that surrounds the site, its age, design, functionality and how the proposed development can integrate into this form.*

Adjoining the subject site to the south is a transport and logistics company and thence a supplier of building panels. Surrounding industrial uses have little or no functional relationship with the subject site. The proposed development will achieve a satisfactory integration with surrounding development by virtue of its industrial nature.

## Transport Routes and Road Patterns

*Document existing transport networks including road hierarchy, cycleways, pedestrian routes and how the proposed development will support or has the capacity to capitalise on such infrastructure provision*

In the vicinity of the subject site, Cowpasture Road is a two lane urban road forming a local access function. South of its intersection with the Horsley Drive, Cowpasture Road is a major north south sub-arterial route providing connectivity between Camden Valley Way at Leppington in the south, and The Horsley Drive at Wetherill Park in the north.

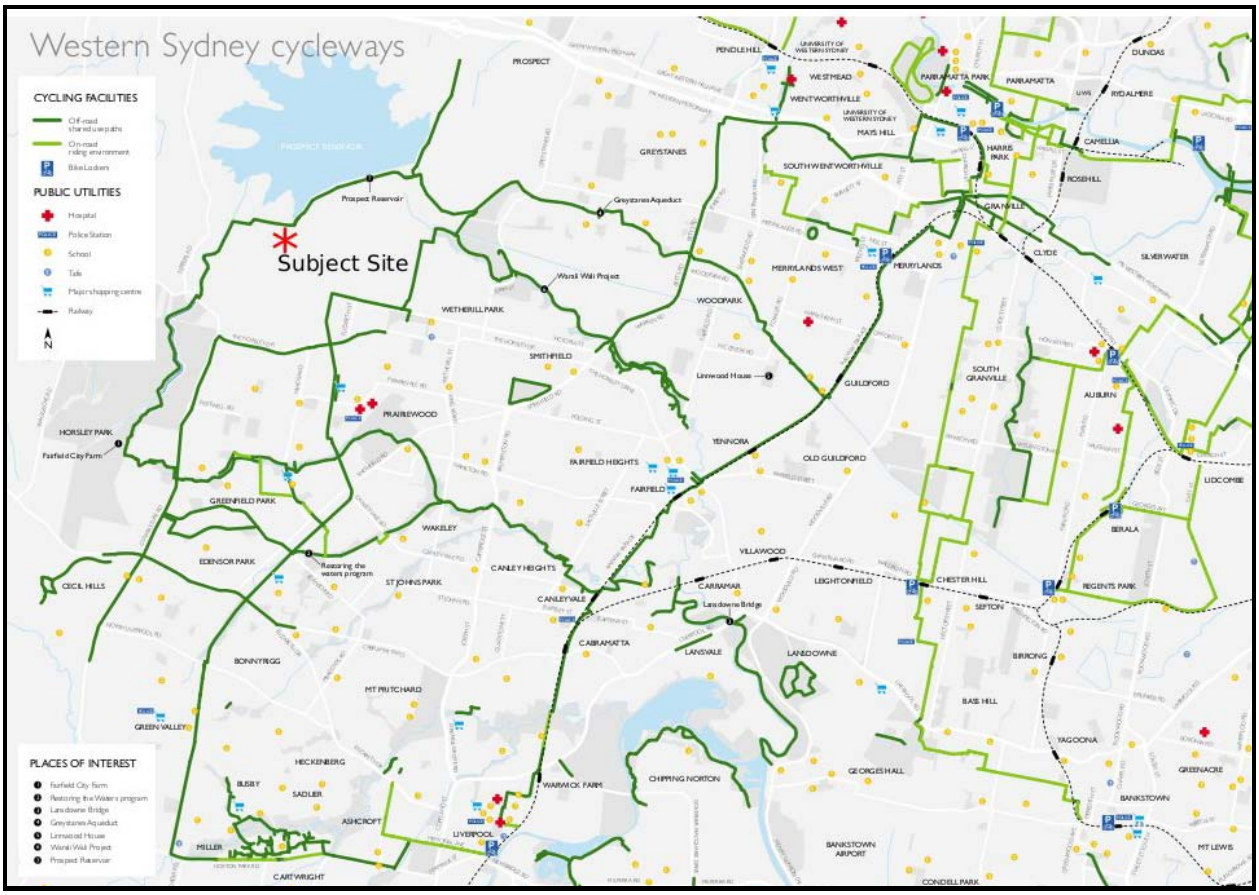
The Horsley Drive represents the southern boundary of the Wetherill Park Industrial Area. It is a four lane divided carriageway road which provides a sub-arterial function, providing connectivity between the M7 Motorway in the west and The Hume Highway at Lansvale in the south east.

Wetherill Park is also serviced by the Liverpool to Parramatta Bus Transitway. The route runs along the eastern side of the industrial estate. The closest T-way stop to the subject site is Victoria, at the intersection of Victoria Street and Canley Vale Road, approximately 1.5km straight line distance or approximately 2km walking distance.

In addition to the T-way, Wetherill Park is serviced by Westbus (Region 3). Route 814 services the subject site, which provides bus transport to Fairfield Station. It runs at approximately 30 minute headways during peak hour.

Wetherill Park and the subject site is also easily accessible by bicycle via dedicated cycleways or bike lanes. The following Figure 2-5 provides an extract of the RTA's published cycleway networks within the vicinity of the subject site.

Figure 2-5: Cycling Facilities Serving the Subject Site




## Development Pattern

*Street layout is an essential element for the ordering of an urban area as it most likely influences the scale and intensity of activity. Information on the street hierarchy not only provides information on the different roles of each street but it ties into the capacity of a proposed development to fit into the function of streets. For example a main arterial road is likely to be wider, more heavily trafficked and noisier than a suburban street.*

*These distinctions in street function will influence a proposed development. The second component of the development pattern is the street and block pattern. The street layout in principle subdivides an area into blocks, but the uses as proposed in the development influence the size and proportion of the block.*

*Understanding this and the size and shapes of allotments will determine a development's compatibility to the street layout.*

The street pattern or road geometry do not represent any impediment to the proposed development. Traffic impacts associated with the proposed use are discussed in detail at Section 5 of this subsection of the EIS.

Streetscape

*This is the three-dimensional space, which encloses and defines the street. Depending on the location this information analyses the presentation of the proposed development to the street, how it will contribute to enhancing the setting for development, improve visual amenity and provides a built form which is consistent with the existing or future character of the local area.*

The streetscape is industrial in nature and the proposed development will be consistent with this character. The development plans submitted with the application include rendered streetscape perspective drawings. These show textured and banded finishes which are considered to provide a satisfactory presentation to the public domain.

Social Contribution

*Outline information that demonstrates how the proposed development will enhance lifestyle experiences, access to social facilities and employment opportunities.*

*The purpose of this information is to ensure that the quality design outcomes and the implementation of the development supports the social goals of Council which is to fundamentally enhance the quality of life for existing and future communities and increase their accessibility to services*

The proposed development enhances the economic base of Fairfield's industrial and manufacturing sector, provides additional employment and increases the workforce population catchment for human services and convenience business servicing the Wetherill Park locality. The proposed development is considered to achieve positive social contribution.

### 2.3.4 Other State Environmental Planning Policies Applying to the Land

Table 2-2 provides a list of all applicable SEPPs (and deemed SEPPs) together with a comment on their relevance to the subject application.

| Table 2-2: List of Applicable State Environmental Planning Policies | |
|---|---|
| Policy | Comments |
| SEPP No 4 – Development Without Consent and Miscellaneous Exempt and Complying Development. | No application |
| SEPP No 10 – Retention of Low Cost Rental Accommodation. | No application |
| SEPP No 19 – Bushland in Urban Areas. | No application |
| SEPP No 32 – Urban Consolidation (Redevelopment of Urban Land). | No application |
| SEPP No 33 – Hazardous and Offensive Development. | No application |
| SEPP No 37 – Continued Mines and Extractive Industries. | No application |
| SEPP No 45 – Permissibility of Mining. | No application |
| SEPP No 50 – Canal Estates . | No application |
| SEPP No 55 – Remediation of Land. | There is no evidence that the subject land is contaminated and the proposed development does not represent a potentially contaminating land use. |
| SEPP No 64 – Advertising and Signage. | New signage does not form part of the subject application. |
| SEPP No 65 – Design Quality of Residential Flat Development. | No application |
| SEPP (Major Development) 2005. | No application |
| SEPP (Infrastructure) 2007. | The subject land does not front a classified road whilst the proposed floor space does not trigger the SEPP given that the proposed floor space is below 20,000sqm (Column 2 of Schedule 3) |
| SEPP (repeal of Concurrence and Referral Provisions) 2008. | No application |
| SEPP (Exempt and Complying Development Codes) 2008. | No application |
| SEPP (Affordable Rental Housing) 2009. | No application |
| Deemed SEPP - SREP No 9 – Extractive Industry (No 2). | No application |
| Deemed SEPP – The Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment. | See Section 2.2 above |
| SEPP 59 – Central Western Sydney Economic and Employment Area[2] | No application |

[2] *Council's 149 Certificate No 12457/2010 dated 8 December 2010 states SEPP 59 – Central Western Sydney Economic and Employment Area applies. The certificate is issued in error in that SEPP 59 is now entitled SEPP 59 – Central Western Sydney Regional Open Space and Residential. The economic and employment component of the former SEPP 59 has been transferred to a new SEPP, being SEPP (Western Sydney*

The proposed development is not inconsistent with the State Environmental Planning Policies.

### 2.3.5 Plan for Bushfire Protection

The subject site is identified as bushfire prone land as defined in Section 4 of the Environmental Planning and Assessment Act 1979. The following provides a bushfire threat assessment pursuant to Planning for Bushfire Protection 2006.

Section 79BA of the Environmental Planning and Assessment Act 1979 states the following with respect to development of bushfire prone land.

> *79BA Consultation and development consent—certain bush fire prone land*
>
> *(1) Development consent cannot be granted for the carrying out of development for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bush fire prone land unless the consent authority:*
>
> *(a) is satisfied that the development conforms to the specifications and requirements of Planning for Bushfire Protection, ISBN 0 9585987 8 9, produced by the NSW Rural Fire Service (or, if another document is prescribed by the regulations for the purposes of this paragraph, that document), that are relevant to the development, or*
>
> *(b) has consulted with the Commissioner of the NSW Rural Fire Service concerning measures to be taken with respect to the development to protect persons, property and the environment from danger that may arise from a bush fire.*
>
> *(2) In this section:*
>
> *special fire protection purpose has the same meaning as it has in section 100B of the Rural Fires Act 1997.*

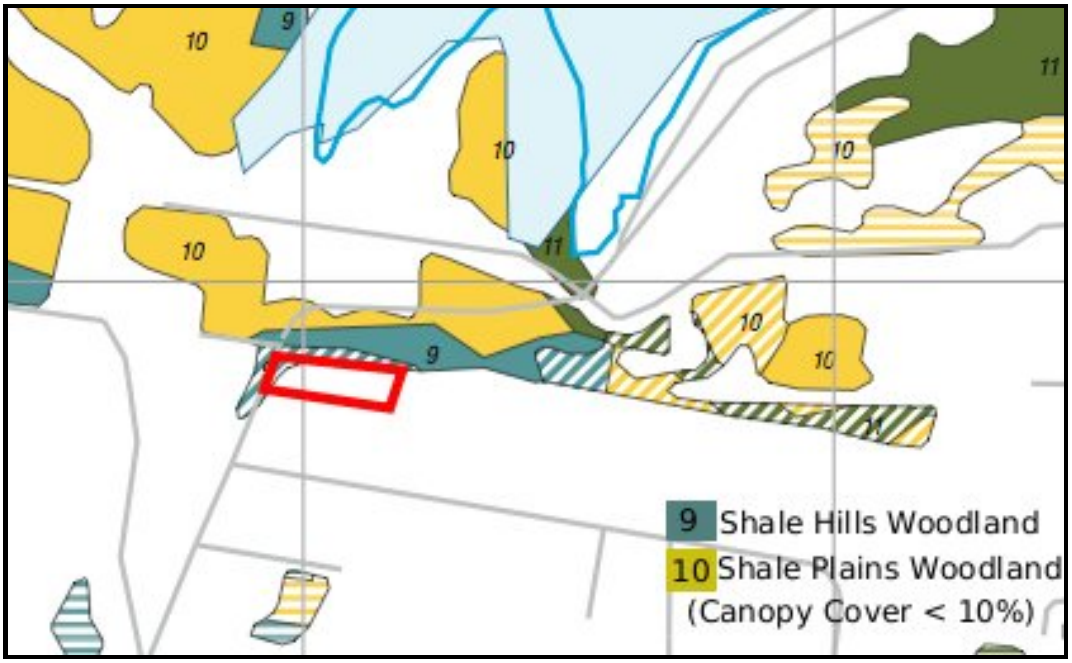
Having regard to the above, the consent authority must be satisfied that the proposed development conforms to the specifications and requirements of Planning for Bushfire Protection 2007 (PBP). Despite the terms and wording of Section 79BA (1) being inclusive of all development other than those types excluded in parenthesis, PBP does deal primarily with residential and special fire protection purposes. Nevertheless, given the terms of Section 79BA of the Act, it is appropriate to consider available and proposed Bushfire Protection Measures (BPMs) are detailed in PBP.

*Employment Area) 2009 which came into effect on 9 July 2009. However the 2009 SEPP does not include Wetherill Park in the land to which the SEPP applies.*

### 2.3.5.1 Identification of Fire Threat

The bushfire threat is primarily from Shale Hills Woodland situated to the north and north west of the subject site. The following figure, Figure 2-6, provides an extract of National Parks and Wildlife Service (NPWS) vegetation mapping which shows vegetation type and canopy cover.

Figure 2-6: National Parks and Wildlife Service Vegetation Mapping




The northern adjoining vegetation is located upslope of the subject property

### 2.3.5.2 Bushfire Protection Measures

*Asset Protection Zones*

Asset protection zones (APZs) provide a buffer between a bushfire hazard and the asset which is to be protected. They serve the purpose of reducing fuel loads and radiant heat to lessen the impact of heat and flame on buildings and to provide a defendable space from which property protection can be undertaken.

The existing building is provided with no APZ to its northern boundary. The front setback and the width of Cowpasture Road act as an APZ to the north western adjoining vegetation.

There is no minimum APZ requirement for industrial development pursuant to PBP. The proposed development does not significantly reduce the APZ which is presently available to the building and it is considered that the application is not inconsistent with PBP with regard to APZ requirements.

*Construction Standards*

The proposed silos are to be accommodated within precast concrete panel and colourbond screening enclosures. Each of these proposed building materials offers good flame protection. The material used and stored on the premises as part of the proposed development are not flammable and the proposed construction methods are considered suitable and appropriate. The application is not inconsistent with PBP with regard to construction standard BPMs.

*Access Standards*

Emergency vehicle access to the site is available from Cowpasture Road and the site access driveway. The proposed development does not result in any change to the approved access standards and nor does the proposed development introduce a need for improved access. Accordingly, the proposal is considered to be not inconsistent with PBP with regard to access BPMs.

*Water Supply and Utility Services*

The subject site is serviced by town water supply. Prospect Reservoir provides an ample source of additional alternative water supply. These existing water supply arrangements are considered to be appropriate and the proposed development is not inconsistent with PBP with regard to water supply and utility service.

*Emergency Management Arrangements*

An emergency and evacuation management plan has been developed as part of the site's existing operation. The proposed development does not require any alteration or amendment to the existing plan. The application is considered satisfactory with regard to this issue and is not inconsistent with PBP.

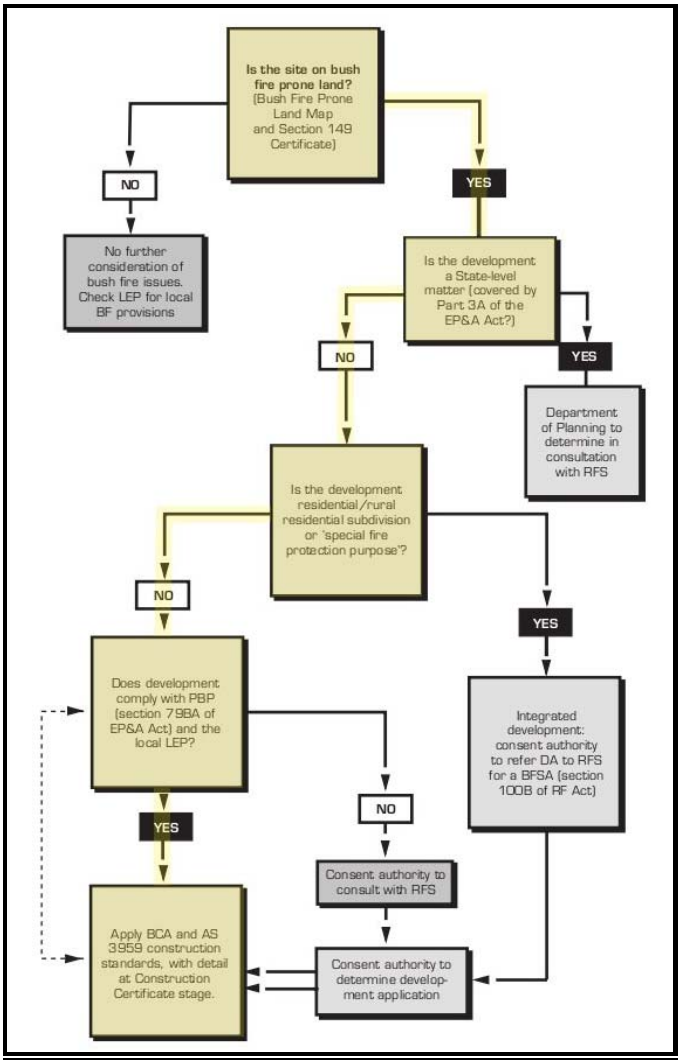
*Landscaping*

The landscaping works approved as part of the existing development do not result in any unreasonable increase to bushfire threat. The proposed development does not involve any additional landscaping works and the application is not inconsistent with the landscaping BPM requirements of PBP.

### 2.3.5.3 Compatibility for Plan for Bushfire Protection 2006

There are no aspects of the proposed development which are inconsistent with the requirements of PBP. The test established by Section 79BA of the Act is represented in diagrammatic form at Figure 2-2 of PBP as a Development Control Process flow chart. That diagram is repeated below as Figure 2-7, with the pathway followed by this application shown highlighted.

Figure 2-7: Development control Process for Developments in Bushfire Prone Areas (Flow Chart Extract from PBP)




Given that the proposed development is not inconsistent with the requirements of PBP, referral to the RFS is not required.

### 2.3.6 Director General's Requirements

In accordance with Clause 73 of the Environmental Planning and Assessment (EP&A) Regulation 2000, Director General's Requirements were obtained for the proposed development. A copy of the Director General's Requirements are presented in Attachment 2.

Key environmental planning issues raised by the requirements and subsequently addressed in this EIS are identified in the table below:

Table 2-3: Compliance with Director General's Requirements

| Director General's Requirement | EIS Reference | |
|---|---|---|
| | Section | Page No. |
| **General Requirements: (Refer Clauses 71 and 72 of the Environmental Planning and Assessment Regulation 2000)** | | |
| The Environmental Impact Statement must include: | | |
| • An Executive Summary | | i |
| • A full/detailed description of the proposal, including: | | |
| ▸ the need for (objectives of) the development; | 1 | 6 |
| ▸ alternatives considered, including the consequences of not carrying out the development; | 1 | 8 |
| ▸ the development to be carried out; and | 3 | 44 |
| ▸ likely staging of the proposal. | 3 | 58 |
| • A risk assessment of the potential environmental impacts of the proposal, identifying any key issues for further assessment. | 6 | 149 |
| • A detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above), which includes: | 1 | 11 |
| ▸ a description of the existing environment, using sufficient baseline data; | 4 | 60 |
| ▸ any likely interactions between the proposed operations and existing/approved development and landuse in the area; | 3 | 47 |
| ▸ an assessment of the potential impacts of all stages of the proposal, including any cumulative impacts, taking into consideration any relevant policies, guidelines, plans and statutory provisions (see below); | 7 | 174 |
| ▸ A description of the measures that would be implemented to avoid, minimise, mitigate and (if necessary) offset the potential impacts of the proposal, including detailed | 8 | 183 |

Table 2-3: Compliance with Director General's Requirements

| Director General's Requirement | EIS Reference | |
|---|---|---|
| | Section | Page No. |
| contingency plans for managing any significant risks to the environment;<br>▸ A list of any approvals that must be obtained under any other Act of law before the development may lawfully be carried out; | 1 | 11 |
| • A compilation (in a single section of the Environmental Impact Statement) of all the proposed environmental management and monitoring measures; | 8 | 183 |
| • A detailed description of how the environmental performance of the proposal would be monitored and managed over time; | 8 | 186 |
| • A conclusion justifying the development on economic, social and environmental grounds, taking into consideration whether the proposal is consistent with the objects of the Environmental Planning and Assessment Act 1979; and | 9 | 191 |
| • A signed declaration from the author of the Environmental Impact Statement, certifying that the information contained within the document is neither false nor misleading. | 9 | 193 |
| Specific Issues | | |
| • Noise – during construction, operation and traffic. This assessment must consider any potential impact on nearby private receptors; | 5 | 82 |
| • Air quality – including odour and dust in accordance with relevant Department of Environment, Climate Change and Water guidelines. This assessment must consider any potential impacts on nearby private receptors; | 5 | 101 |
| • Soils and water – including:<br>▸ Impacts on surface water, stormwater management, wastewater management and flooding; | 5 | 33<br>36<br>40 |
| ▸ Details of water requirements including water supply; and | 3 | 54 |
| ▸ The potential for soil and groundwater contamination. | 5 | 127 |
| • Traffic and transport; | 6 | 163 |
| • Hazards and risks – in accordance with the State Environmental Planning Policy No. 33 – Hazardous and Offensive Development; | 6 | 150 |

Table 2-3: Compliance with Director General's Requirements

| Director General's Requirement | EIS Reference | |
|---|---|---|
| | Section | Page No. |
| • Fire and incident management – including technical information on the environmental protection equipment to be installed on the premises such as dust and noise controls, spill cleanup equipment and fire management and containment measures; | 6 | 151 |
| • Heritage – including Aboriginal; and | 6 | 156 |
| • Flora and fauna. | 5 | 142 |
| Environmental Planning Instruments | | |
| The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to: | | |
| • State Environmental Planning Policy (Infrastructure) 2007; | 2 | 34 |
| • State Environmental Planning Policy No. 33 – Hazardous and Offensive Development; | 2 | 34 |
| • Fairfield Local Environmental Plan 1994; and | 2 | 16 |
| • Relevant development control plans and section 94 plans. | 2 | 27 |
| Guidelines | | |
| During the preparation of the EIS, you should/must consult the Department's EIS Guideline – Concrete Works. The guideline is available for purchase from the Department's Information Centre, 23-33 Bridge Street, Sydney or by calling 1300 305 695. | Throughout the report | - |
| Consultation | | |
| During the preparation of the EIS, you should/must consult the relevant Local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult surrounding landholders and occupiers that are likely to be impacted by the proposal.<br><br>Details of the consultations carried out and issues raised must be included in the EIS. | | iii |

# 3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

## 3.1 SITE DESCRIPTION

### 3.1.1 Location

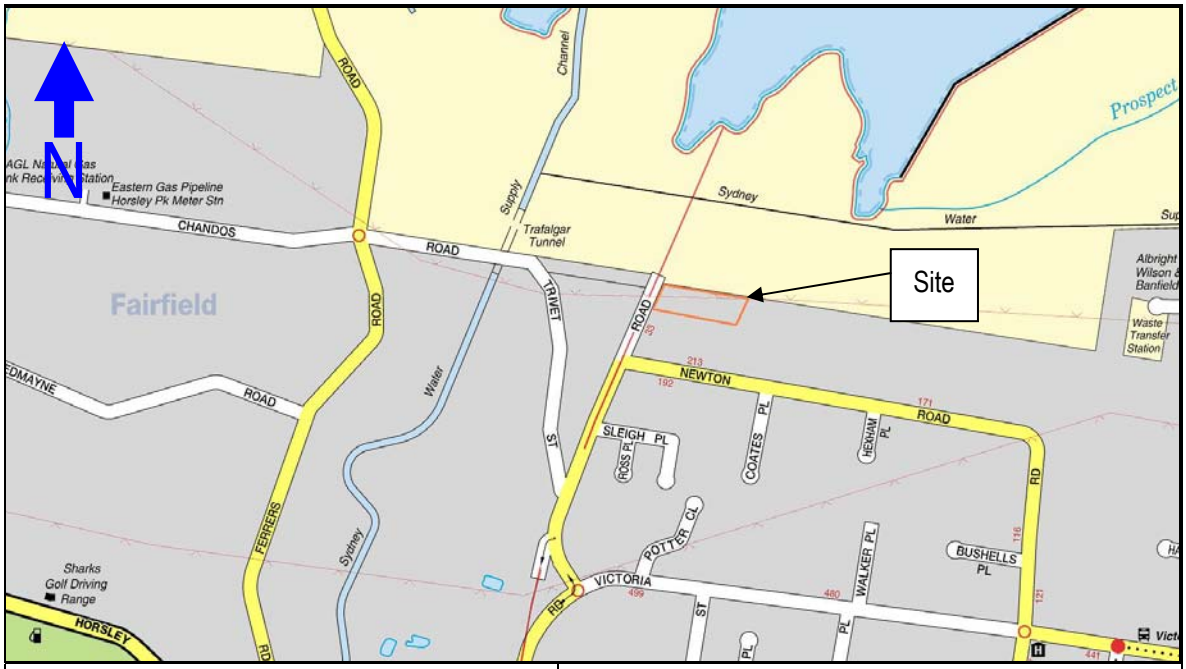
The proposed concrete batching plant is to be located at the existing precast concrete manufacturing facility at 33-41 Cowpasture Road, Wetherill Park NSW 2164. The site is identified as Lot 79 D.P. 27515. The site is located on the north-west end of the Wetherill Park industrial estate.

The site's northern boundary of the site is adjoined to an existing pedestrian walkway. Located further north of the pedestrian access (adjacent to the site's northern boundary) is Sydney Water's Prospect Water Filtration Plant. Prospect reservoir is located approximately 400 m north of the Austral Precast site.

The southern boundary is adjoined to 43-49 Cowpasture Road. The western boundary fronts Cowpasture Road whilst the eastern boundary is adjoined to 213-217 Newton Road. The site adjoins industrial premises to the south and east.

The site is shown in regional context in an industrial area, the nearest residences are located a minimum distance of 500 m from the site.

Figure 3-1: Site Location at Wetherill Park




| Legend: | Image Source: UBD on Disk © 2004 – Australian Cities |
|---|---|
| Site Boundary | (Approximate Scale: 1:55,555) |

### 3.1.2 Site Features

The site is trapezoid in shape with a total area of the site is approximately 2.1 hectares. The terrain of the site and the immediate surrounding areas are relatively flat, except for the terrain fronting the site at Cowpasture Rd, which can be seen to elevate gradually at the end of Cowpasture Rd (located north of map) towards the Sydney Water filtration plant.

The site currently contains a precast concrete manufacturing plant. All current activities and operations are carried out in a series of buildings, all built close to each other. The current buildings on site will not be removed as part of the development application, but some areas would be modified so that the current functions of the existing plant would be integrated with the proposed concrete products batching plant.

### 3.1.3 Land Ownership

Land is currently owned by Sasso Property Ltd, which is now owned by Austral Precast Pty Ltd. These companies are in turn owned by Brickworks Ltd.

### 3.1.4 Site History

The site has been operating as a precast concrete manufacturing plant since the year 2000's. The site's previous use(s) is unknown – the site was undeveloped prior to 2000. Previous use was understood to have been for market gardening.

In 1999 the site was an open grass paddock with some trees. At this time there was a house and associated sheds in the NW corner. These were removed when the site development commenced in the early 2000s.

### 3.1.5 Employment

The expansion of the site would generate employment of 4 additional personnel. There are currently 54 personnel employed at the site. The majority of the employment is daytime.

The employment would result from the operators of the concrete plant and the increase in the production of the precast manufacturing processes.

This increase in precast production would not require alterations to the footprint of the existing buildings. The increase in production output would result from the greater efficiencies that occur from the on site production of concrete.

Twin mixers are to be installed in the concrete plant so that the process of casting the precast panels is continuous and a faster part of the process.

The hours of operation would be extended to through shifts.

### 3.1.6 Hours of Operation

A through shift operation would be required. This would be required Monday to Friday and Saturday would require a two shift operation.

Shifts typically start according to the following:

- Day shift 6am – 3pm
- Evening 3pm – 11pm
- Night shift 11pm – 7am

There may be a minor overlap of shifts.

The majority of the production would be during day and evening periods.

The operation of the concrete plant has been designed so that raw material deliveries are only required during daytime from 7am to 6pm.

The concrete plant has been using Colorbond and concrete precast panels for visibility reasons but this has benefitted noise control and prevention of wind erosion of dust and fine particulates.

## 3.2 PROPOSED DEVELOPMENT ACTIVITIES

In summary, the proposed development includes the following:

- Addition of a proposed concrete products batching plant, which would consist of:
  - Plant to receive raw materials, which are:
    - Sand;
    - Aggregate; and
    - Cement and flyash.
  - Store raw materials in fully enclosed bins (sand & aggregate) and silos (cement/flyash);
  - A mixing line, which would mix raw materials in certain ratios to produce ready-mixed concrete in twin rotary mixers;
  - A system to weigh and deliver (via conveyor belts and skip hoist) the raw materials into the mixing line;
  - Deliver the ready-mix concrete into the existing precast concrete manufacturing plant, which shall require modifications to areas of the existing plant to allow receipt of these products; and
  - Other auxiliary systems such as waste concrete and water recycling and safeguards for receiving cement/flyash into silos.

Figure 3-2 provides a flowsheet of the current and proposed operations and Figure 3-3 provides the environmental mass balance of the proposed development.

Figure 3-2: Primary Development Activities

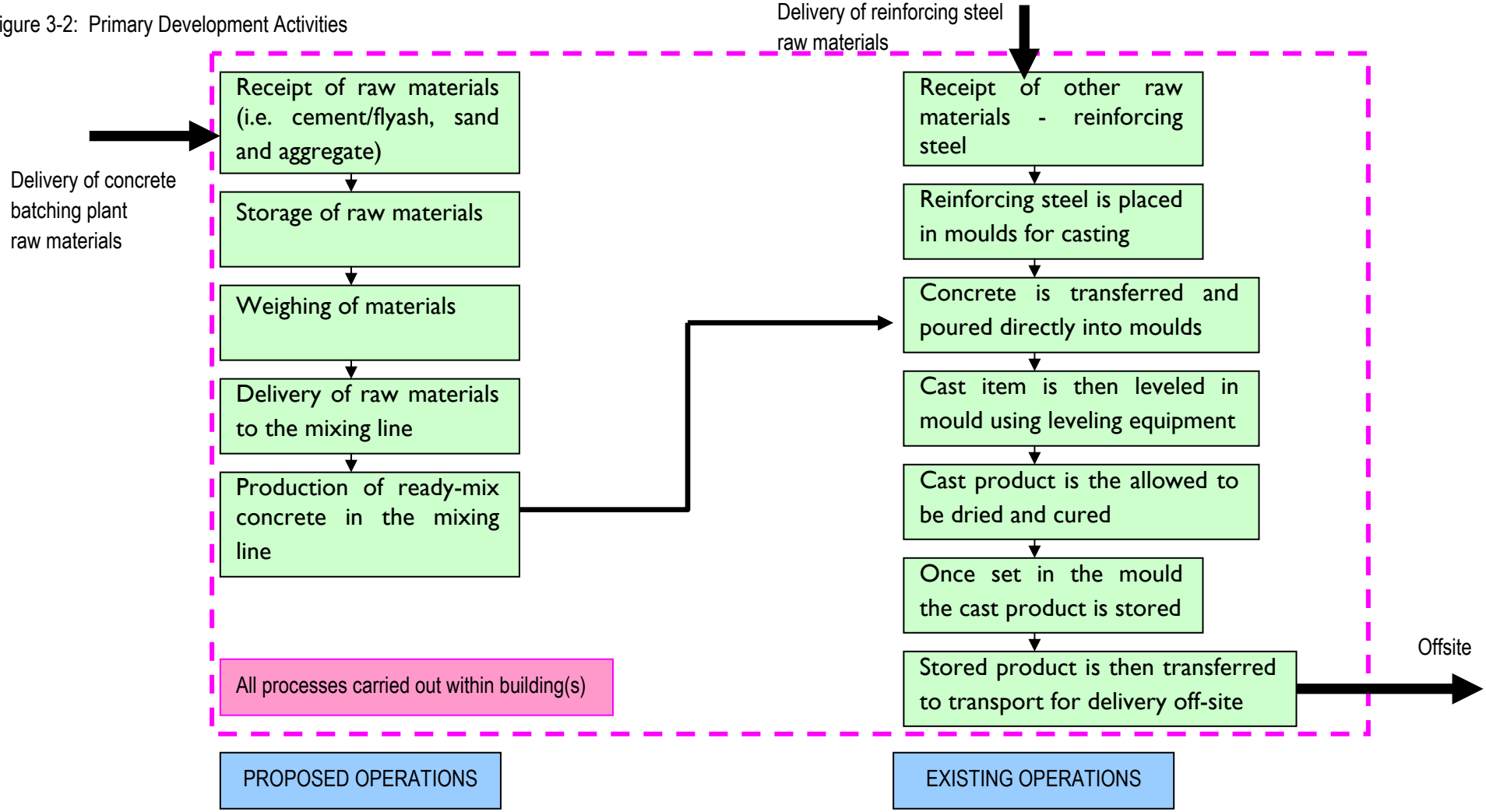
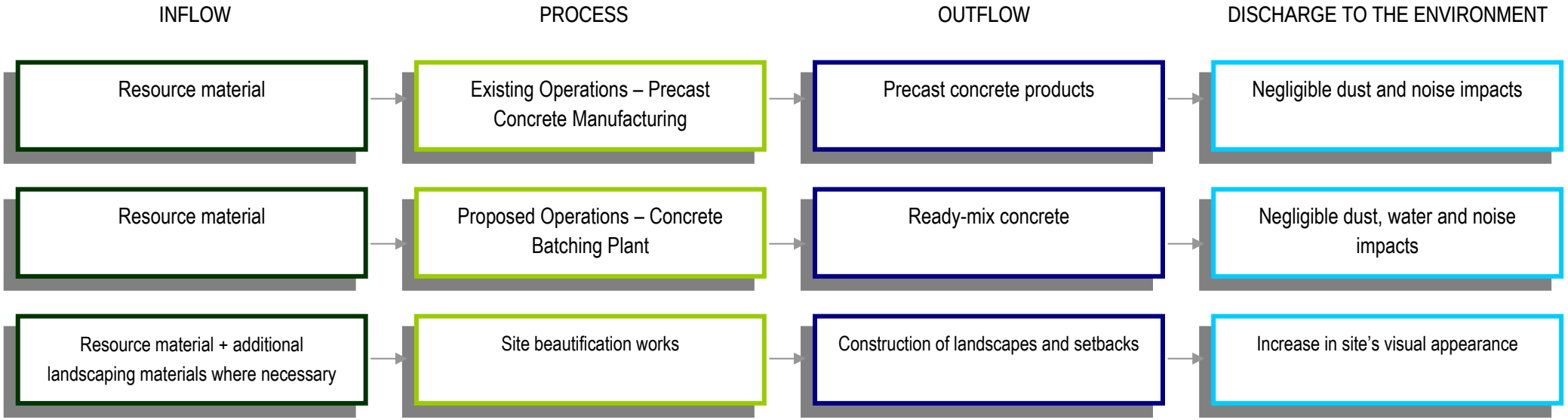


Figure 3-3: Environmental "Mass Balance"



The completion of the proposed development would replace the current practice of receiving ready-mix concrete delivered by truck mounted concrete mixers. With the exception of the storage silos, the majority of the plant infrastructure would be located inside the existing factory unit 1.

The primary raw materials consist of sand, aggregates and cement/flyash with other minor ingredients including cement additives. These additives come in liquid form and are neither classified as hazardous or dangerous.

### 3.2.1 Receipt and Storage of Raw Materials

Sand and aggregates would be delivered by rear tilting trucks – either tippers with dog trailers or semitrailers. Upon arrival, the truck would drive over the loading pit and dump the materials to a inground hopper (bin). The hopper would come with a frame to be supported by the concrete foundation constructed in the pit (excavated for the hopper). A cover would be installed on top of the hopper to reduce dust emissions along with two vibrators mounted on the outside of the hopper to improve material flow during loading. The capacity of the truck dump hopper is approximately 32 $m^3$.

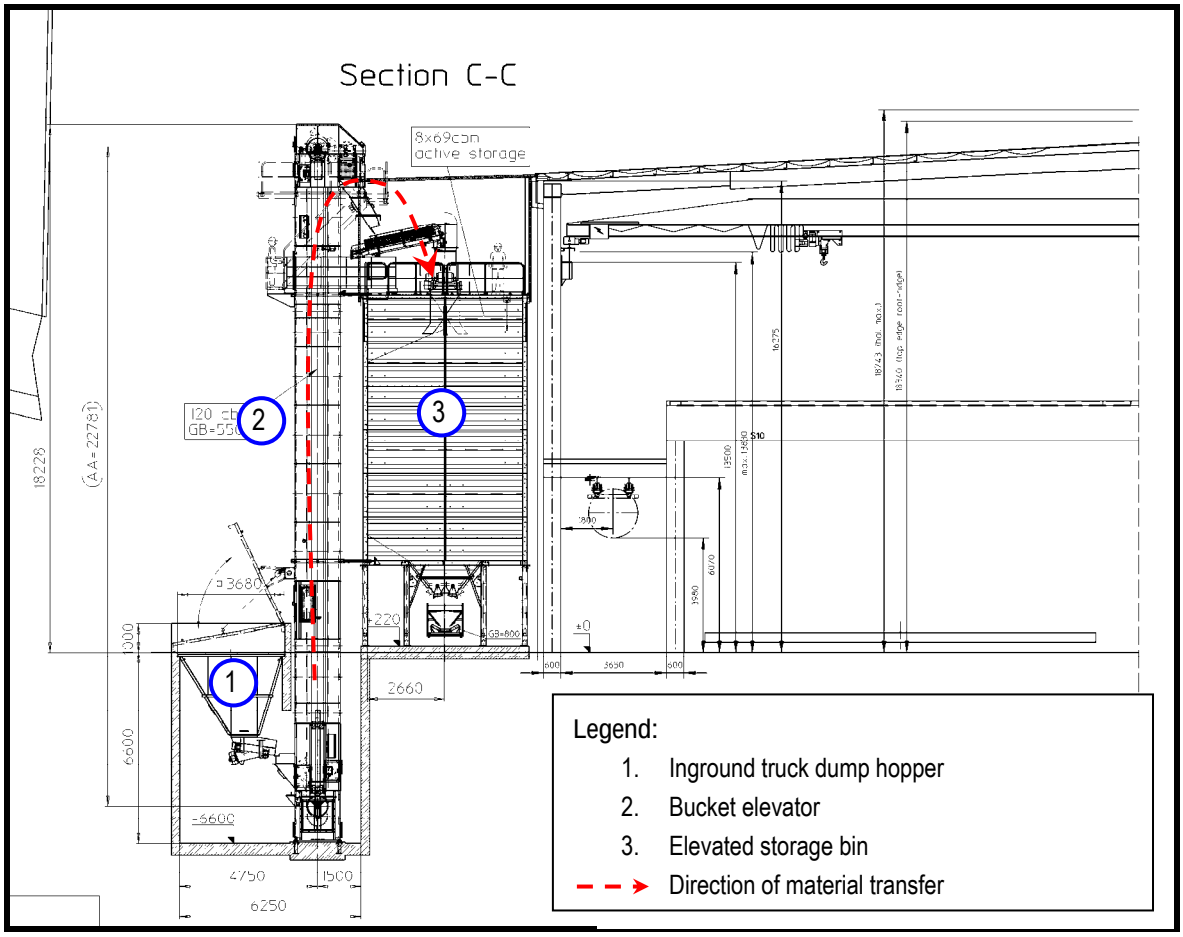
The inground hopper is connected to a bucket elevator which mechanically transfers the materials vertically into the elevated bins (Figure 3-4). The bucket elevator has a conveying capacity of up to 115$m^3$/hour. The bucket elevator consists of the following:

- Bottom section with material feed chute, return drum and speed monitor;
- Twin tunnel with inspection opening for mounting of buckets and maintenance purposes;
- Access staircase from the floor level to the maintenance platform including an overpass to the catwalk along the distributor belt;
- Top section with assembly and inspection opening, drive drum, shaft-mounted gear motor and misalignment switch;
- Maintenance platform with drive; and
- Bucket elevator belt.

Belt conveyors are used as intermediate conveyor and for distribution purposes. The belt conveyor consists of galvanised belt frame, drive and return drum, bearing stations, scraper for inner and outer belt surfaces and controls including pull-cord with emergency stop switch. A catwalk is installed to allow monitoring and maintenance of distribution belts.

There would be 8 elevated bin compartments used for storing sand and aggregates, each having a capacity of approximately 150 tonne. The bins would be fitted with level indicators and probes to avoid overfilling of silos. The bins would be made of steel and would be enclosed by Colorbond sheeting on the west side and would also be roofed.

Figure 3-4: Diagram of the inground Receiving Hopper (Bin) and Bucket Elevator




Cement/flyash would be delivered by cement tankers. The unloading process to the cement/flyash silos is via a fully enclosed pneumatic transfer via the filling pipelines. There would be 5 conical shaped cement/flyash silos with approximate capacity of 60 tonne each. Some of the important features installed at the silos include:

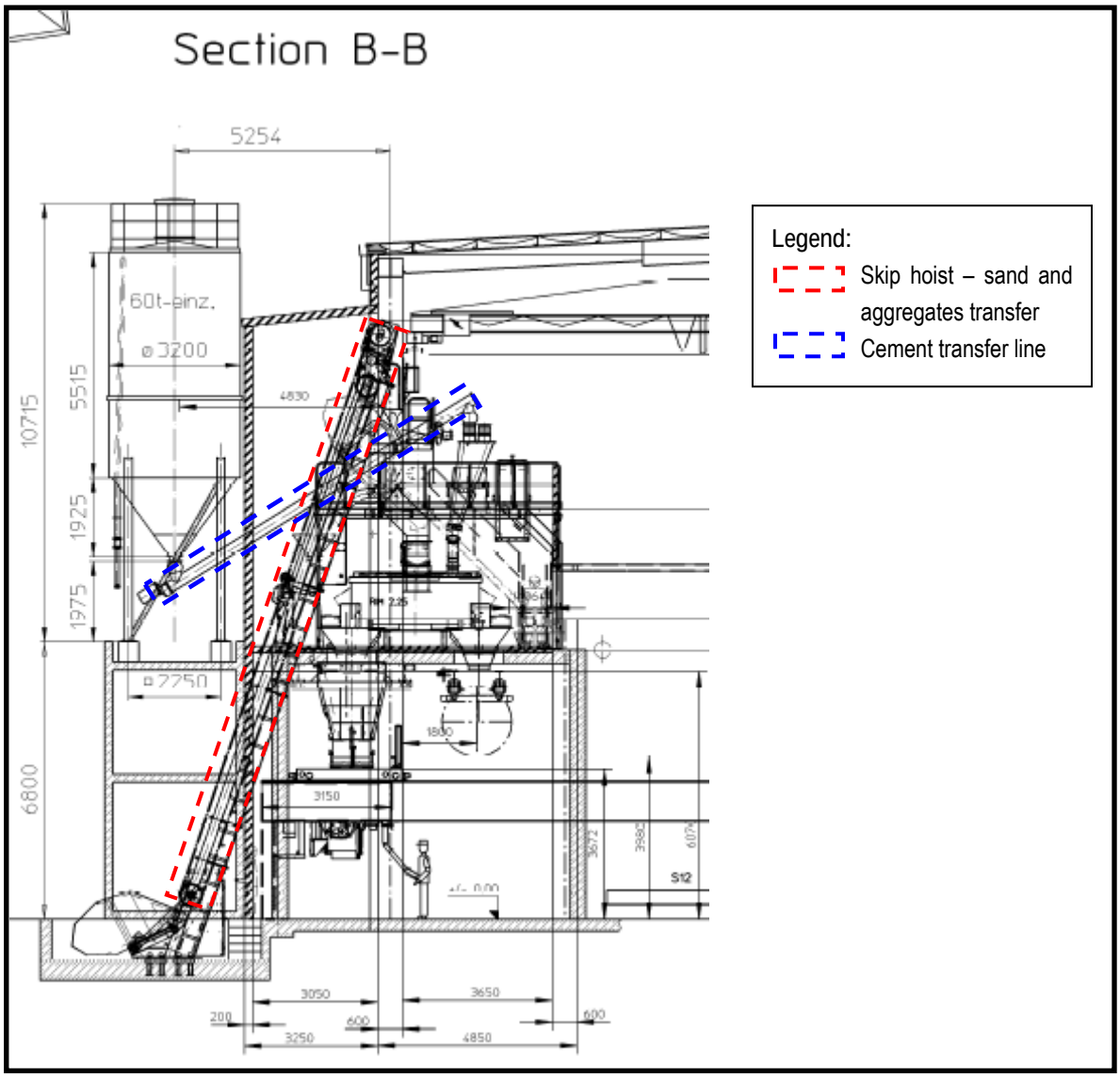
- Automatic overfilling safety devices including a warning alarm, overpressure switch and high level alarm with interlock to close the filling line;
- Radar level indicators for continuous measuring;
- Paddle type level indicators for maximum filling level indication;
- Aeration devices dislodge by means of short air thrusts cement piles which can form in the conical part of the silos;
- Dust collectors with polyester filter cartridges (surface area is approximately 24 $m^2$), automatic reverse pulse filter cleaning, electronic control with sequence timer; and
- Silo safety valve against overpressure piped to 1m above the ground. This piping would also be connected to the clean air outlet of the dust collector.

### 3.2.2 Weighing and Delivery of Raw Materials to the Concrete Mixing Line

The batching process involves weighing individual raw materials and transferring these to the twin mixers. The sand and aggregates would be unloaded via dosing cones consisting of electro-pneumatic segmental batching gates. Two gates per bin are installed to allow coarse and fine batching by adjusting the width of the gate opening. Sand and aggregates would be unloaded onto a dosing belt with batching capacity of 100 $m^3/h$ then to a weigh belt where it would be automatically weighed. The electro-mechanical weigher has a digital scale indicator installed in the control system.

From the weighing belt, the weighed material would be transferred to a belt conveyor connected to a skip hoist. Once the sand and aggregates are transferred to the skip, the materials would be hoisted up and dumped into the mixers. Cement is transferred directly from the silo into each mixer pneumatically.

Figure 3-5: Diagram of the Skip Hoist and Cement Transfer Line to the Mixer



### 3.2.3 Production of Ready-Mix Concrete

The fully automated central mixers consist of the following:

- Counter current mixers with output rate of 2,000 L of compacted fresh concrete/batch;
- Additional mixer discharge gates – pneumatically operated;
- Dust collector consisting of 18 $m^2$ filter area and a 1.5 kW exhaust fan for filtering the contaminated air displaced when charging the mixer;
- Pneumatic butterfly valves to avoid impact of the dust collector on the weighing results;
- Concrete discharge cones for discharging concrete into the mixer;
- Intermediate hoppers – hydraulically operated to receive the finished concrete batch;
- Skip hoists with bottom discharge gate and anti freefall devices to prevent the skip hoist bucket from free falling down in case of cable rupture;
- Skip hoist tracks;
- Set of safeguard panels installed between the skip hoist and the sand and aggregate silos with safety stop switch mounted on the access door;
- Electro-mechanical cement weigher;
- Electro mechanical water weighers with two inlets for clean and recycled water;
- Volumetric water dosification with fully automatic by impulse-water meter for hot water up to 90$^{o}$C;
- Mixer service control panels for cleaning and maintaining the mixer;
- Installation for compressed air for pneumatic operation of aggregate and cement discharge gates;
- Pneumatic silencers on all air operated valves;
- Mixer platform with service platform surrounding the mixer, columns and heavy cross bracing;
- Large platforms mounted at mixer level on both sides, with chequer plate floor and safety railings; and
- Staircase to the mixer platforms.

The software used to formulate the concrete mix is capable of storing up to 1,000 concrete formulations consisting of 12 types of aggregates, 5 types of cement, 3 type of water and 4 types of admixtures. Each batch produced would be automatically stored in the system on a daily basis. The software also has an inventory capability to record the consumption rate of each material used, perform silo contents calculation and generate other statistical information related to the concrete production activities. The software also allows the central mixer to be started or stopped automatically.

As previously noted each mixer is also equipped with a dust collector system.

Once the concrete mix is fully homogeneous, liquid admixtures and water are then pumped into the mixer. The volume of water added is automatically controlled by the “Hydromat” water metering computer system. The system monitors the water/cement ratio by monitoring the moisture content recorded by a moisture probe which is built into the mixer floor and comparing the result to the target water/cement ratio entered into the computer at the beginning of the batch. The “Hydromat” system is connected to the weighing software where the weight of the cement is taken from. Manual addition of water is possible despite the automatic control by the “Hydromat” system.

The resulting concrete product is transferred to the adjoining precast plant for further processing to produce precast concrete products.

It is envisaged that the site would approximately produce of up to 60,000 $m^3$ of ready-mix concrete per year to supply the existing precast concrete manufacturing facility.

The proposed layout of the concrete batching plant has been provided as Figure 3-6.

### 3.2.4 Mixer Cleaning

The mixer is regularly cleaned, but would only be washed 3 to 4 times a day since the type of ready-mix concrete generated would be the same if not similar. The mixer cleaning system consists of the following important features:

- High pressure pump unit with a pumping flowrate of up to 50 L/min and operating pressure up to 110 bar;
- Water inlet and outlet assembly with shut-off valve, connection nipple, dirt trap and hose for vibration-free connection of the unit to the water supply (for water inlet) or the pressure line (for water outlet);
- Water shortage pressure switch for automatic system cut off in the event of water shortage;
- Rotary nozzle system with 2 spot jet nozzles to achieve greater cleaning action;
- High pressure connection hoses from the changeover valves to the nozzle systems; and
- Water and concrete recycling system "Bibko" consisting of a reclaimer, cement water reuse system and slurry water tank. Aggregate is washed and dried mechanically so that it can be reused on site.

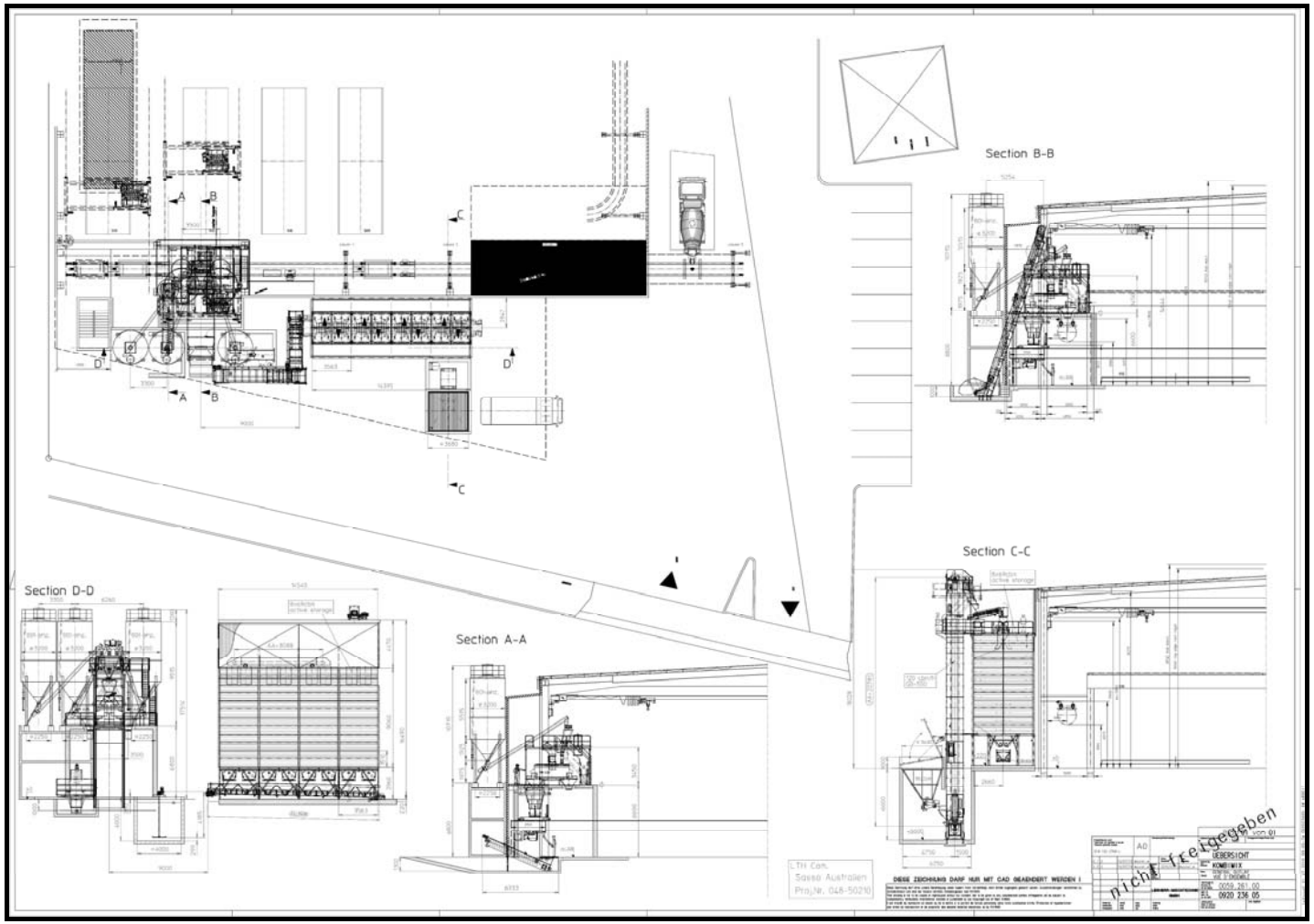
The Bibko system enables the waste concrete to be separated into washed/dried aggregates and a slurry/fines liquid mixture. The liquid is pumped to a storage tank.

This tank has a stirrer to maintain the slurry as a suspension. This water based slurry is able to be reused in the mixers.

The Bibko system is a closed loop system and avoids the need for skips to store the waste concrete.

Section 5.3 discusses the collection of water and reuse in further detail.

Figure 3-6: Proposed Layout of the Concrete Batching Plant.




Source: © Liebherr-Mischtechnik GMBH 2010

## 3.3 RESOURCES

The main resources of material input are categorised under 2 categories: (1) concrete batching plant raw materials and (2) precast concrete manufacturing raw materials. Concrete batching plant raw materials would consist of cement/flyash, sand, aggregate, water and chemical additives whilst precast concrete manufacturing raw materials would consist of ready-mix concrete and reinforcing steel. Approval for the use of the precast raw materials exists in the previous development consent. Production quantities would be able to be increased by extending the hours of operation to three shifts.

The proposed development aims to produce the ready-mix concrete on site using the proposed concrete batching plant, which eliminates the need to receive ready-mix concrete via trucks. As a result of the proposal, the principles of ecologically sustainable development are carried out on site.

Reinforcing steel is continually being received on site for the production of precast concrete products.

A total of approximately 25,000 $m^3$ per annum of precast concrete products is produced by the current site. However, it is envisaged that the proposed development may produce up to 60,000 $m^3$ per annum given the resources (i.e. ready-mix concrete) that could be generated by the proposed development.

## 3.4 DESIGN OF THE DEVELOPMENT

The design of the development is limited by the space available on the existing site. The location selected, presents the best option in terms of space and also the process flow as the finished concrete would need to be transferred directly to the precast plant for further processing.

The following section outlines relevant environmental factors that have been considered in the design phase.

### 3.4.1 Environmental Factors and Design Features

#### 3.4.1.1 Air Quality

Dust impacts resulting from material storage, handling and transfer can be expected. Control measures have been considered to minimise these impacts:

The inground bin (hopper) for the sand and aggregates located underground. This bin has a lid which is only opened during the truck unloading process. The inground bin is connected to a bucket elevator which vertically transfers the materials to the elevated bins in stages. In a conventional concrete batching plant, sand and aggregates would be stockpiled and a front loader would transfer these materials to a hopper connected to a sloping conveyor to be transferred to the respective storage bins. The design applied by Austral Precast would result in less dust impacts due to the following reasons:

- No stockpiling means elimination of dust impacts due to wind erosion;
- Front end loader is not required to transfer the material to the silo, hence reduced dust emission from vehicular movement and dumping to the hopper;
- The surface area of all of the buckets combined would be smaller compared to a conveyor, hence reducing dust impacts due to wind erosion during transfer;
- The vertical movement of bucket elevator would reduce the amount of materials likely to fall from a sloping surface; and
- Storage bins and the transfer conveyors on the top of the bins are roofed.

The loading of cement/flyash to the silo and the loading of materials to the central mixer would also result in dust emissions. These are controlled by installing dust collectors on top of each cement silos and the central mixers. In addition, each mixer would be located in an enclosed area, therefore limiting dust emissions to the external environment.

#### 3.4.1.2 Water Quality

Water quality is considered to be an important environmental factor. The proposed development stores no hazardous or dangerous goods, however some materials used come in liquid form. These are additives, material called Adva (or equivalent) and Daracel (or equivalent) and up to 10,000 L would be stored on site. The MSDS's for these materials have been included as Attachment 7. The storage of liquid chemicals would be bunded to contain 110% of the volume of the storage tanks used for containment of these chemicals. The dimension of the bund would also meet the crest locus requirements, i.e. having a minimum distance of half of the tank height (measured from the ground level of the bund) between the top of the bund wall and the tank wall.

Sources of dust would be managed using best practice and controls to prevent unnecessary dust emissions, in order to prevent contamination via the stormwater route. Dust emission controls are discussed further in Section 5.2.

Appropriate precautionary measures and controls were considered to prevent any of the proposed activities to cause stormwater contamination. This has been discussed in Section 5.3.

#### 3.4.1.3 Noise Amenity

It could be expected that operation of the concrete batching plant would result in an increase in operational noise levels. Building enclosures would be the primary noise control implemented on site. Noise levels experienced at the residences would be below acoustic criteria.

The deliveries of raw materials would only occur during daytime hours i.e. 7am – 6pm.

The enclosing of the plant results in all other noise generating activities being acoustically enclosed by the façade of the plant, i.e. Colorbond and precast concrete. As a result there will be no increase in noise levels at the nearest residences from the operation of the site.

During daytime the existing site operations were found to be inaudible at the nearest residences which are distant from the site.

#### 3.4.1.4 Visual Impact

As previously noted, the site's northern boundary is adjoined to an existing pedestrian walkway. The site would also be visible from Cowpasture Road, which is used by the public although as Cowpasture Road ends at the site this would not be extensive.

The proposed concrete batching plant would not be readily visible from the street level as a result of the design. The raw materials silos located to the west of the existing factory Unit 1 would be shielded with a Colorbond metal clad structure and precast concrete panels. Similar colours to the rest of the buildings on site would be used. The height of these silos would not be higher than the existing building i.e. up to approximately 17.5 m. The silos would be hidden and would look like building structures from the street view. Trees and a landscaped area at the front of the site would be used to enhance the visual amenity of the site. A landscape plan has been prepared. Visual diagrams of the proposed development have also been prepared. The site would also be fully fenced.

#### 3.4.1.5 Traffic Impact

A new driveway is to be constructed primarily for the raw materials delivery of aggregates and sand. Although the proposed development would result in increasing the traffic volume due to raw materials delivery, however this development would replace the requirement of having ready mix concrete delivered by trucks in small batches. Therefore, the overall traffic entering and exiting the site would not change significantly. A detailed traffic study has been conducted and included in Section 6.7. A reduction in the truck numbers would be expected.

## 3.5 SITE LAYOUT PLANS

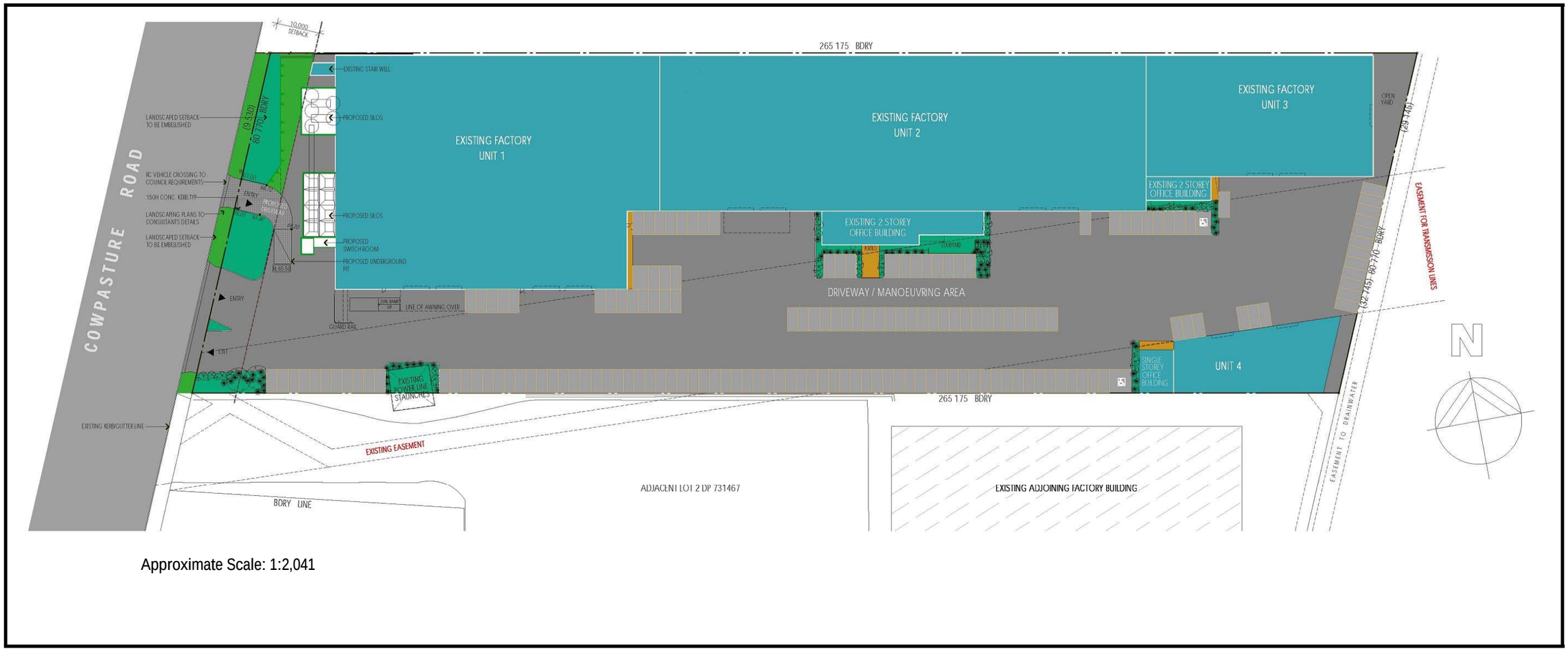
Several environmental aspects identified above were considered in developing the site layout plan. Approximately 20 percent of the site will be developed. The site plan is presented as Figure 3-7.

- Four (4) existing factory units (Unit 1, Unit 2, Unit 3 and Unit 4);
- Unit 4 is not constructed as yet;
- Two (2) existing 2-storey office buildings (for Unit 2 and Unit 3)
- One (1) existing single-storey office building (for Unit 4);
- One (1) proposed switchroom;
- Location of the proposed silos;
- One (1) proposed inground pit/bin with bin/hopper;
- Proposed carparking locations; and
- Driveway and manoeuvring area.

The following are also featured in the site layout:

- Location of the staunches and the easement for the existing transmission power lines;
- Entrances and exit to the site;
- Location of Cowpasture Road; and
- Adjoining premises.

Figure 3-7: Proposed Site Layout




Approximate Scale: 1:2,041

Source: © Algorry Zappia & Associates Pty Ltd, Project No. P3383, Oct 2010

## 3.6 STAGING OF THE DEVELOPMENT

The proposed development would be carried out in a single stage as the site is ready for construction purposes. There would be minimal excavation work for the inground bin and footings. The construction stage would involve in the following order:

- Construction of the new driveway, directly to the west of Unit 1, and at the western (front) boundary of the site off Cowpasture Road;
- Construction of sand, aggregates and cement/flyash silos;
- Installation of transfer equipment including bucket elevator, skip hoist and conveyors;
- Installation of the twin cement mixers;
- Installation of the Bibko waste concrete recycling system; and
- Landscaping.

Installation includes all the environmental safeguards.

The precast concrete plant would remain operational during the construction of the proposed concrete batching plant. The construction stage would take approximately 3 to 6 months followed by the commissioning of the plant.

## 3.7 OPERATIONAL DETAILS

### 3.7.1 Infrastructure and Services

Buildings and associated infrastructure are available therefore would not need to be established during the construction stage.

#### 3.7.1.1 Water

Rainwater collected would be placed into a 20,000 L rainwater tank, which will be located near the cement silos. The rainwater tank would be connected to the twin mixers for re-use of rainwater into the process, as part of the ecological sustainable design of the proposed development.

The batching of the concrete would use 10 million litres of water per annum. This would be drawn from mains supply.

#### 3.7.1.2 Sewage

The current site has an existing sewer system for the amenities. Trade waste is not generated on site. Any process wastewater generated from the concrete plant will be reused on site. This is the purpose of the Bibko concrete recycling process.

#### 3.7.1.3 Electricity and Telecommunications

Electricity and telecommunication lines currently provided to site would be used.

No additional substations are considered necessary at this stage.

#### 3.7.1.4 Fuel and Chemical

The operation of the concrete bathing plant would not require any fuel to be stored on site. Small quantities of chemicals would be stored in a bunded and roofed area, which are to be used as additives into the formulation of ready-mix concrete.

Minor quantities of fuel (LPG) would be stored on site, which would be used to power the forklifts on site.

### 3.7.2 Mobile Equipment

Unlike a conventional concrete batching plant, no mobile equipment (e.g. front loader) would be used. There would be minimal use of forklifts on site as the concrete plant loading, unloading and material handling activities are usually by crane.

### 3.7.3 Hours of Operations

The proposed concrete batching plant would operate for 5 days, 24 hours, Monday to Friday; 16 hours Saturday and typically not on Sundays or public holidays. .

Construction hours would be limited to hours between 6am and 6pm, Monday to Saturday, 7am – 6pm Sunday for internal fitout, electrical wiring and plumbing construction activities outside of 7am – 6pm would be inaudible at the nearest residences.

Maintenance of the production equipment and commissioning may occur during Sundays. This would result in inaudible noise levels at the nearest residences which are distant from the site.

# 4. EXISTING ENVIRONMENT

The following section describes the existing site and the location for the proposed development. The surroundings are characterised and a general description of the environment that is likely to be affected is provided.

## 4.1 EXISTING AND SURROUNDING LAND USE

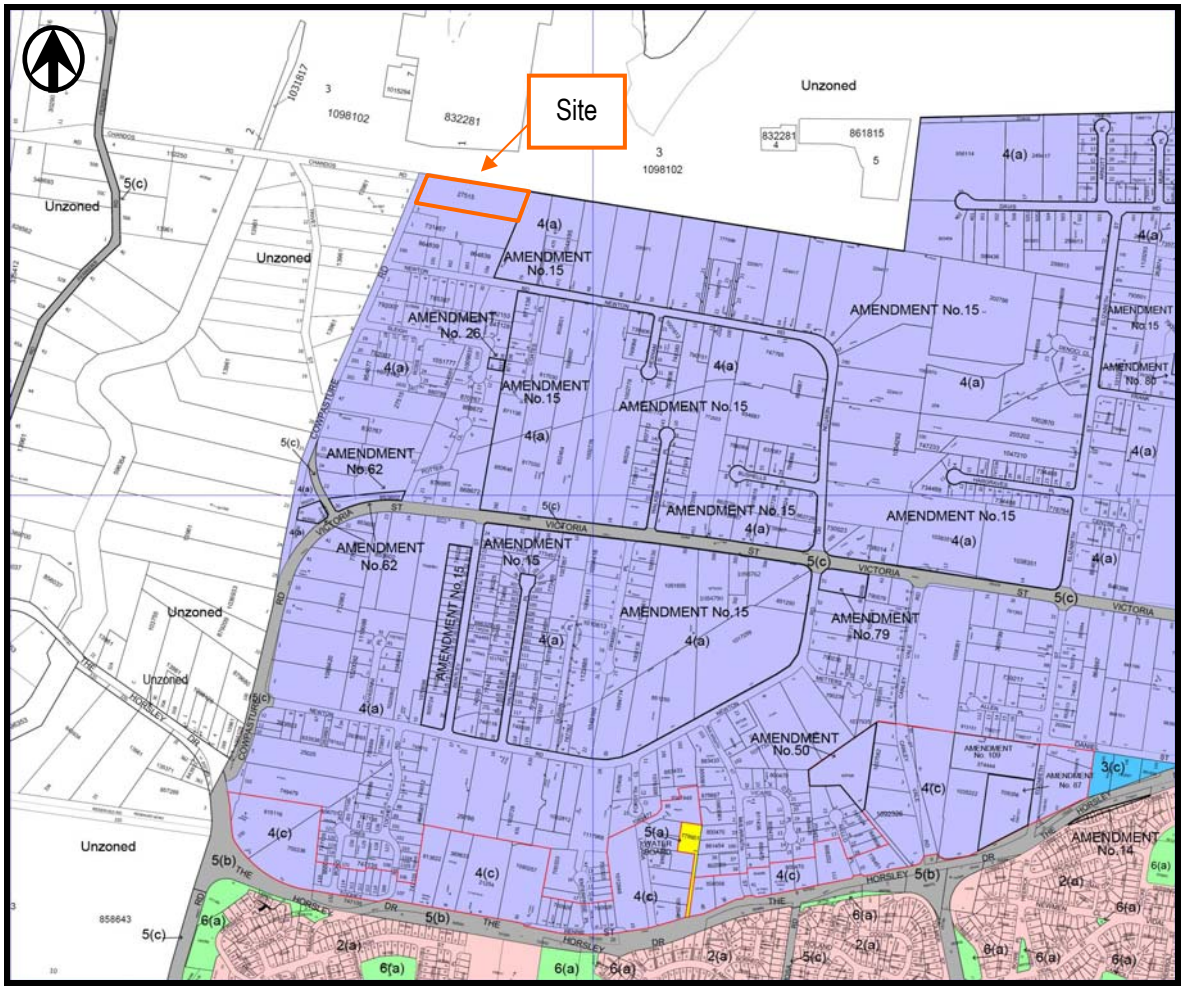
The subject site is located at 33-41 Cowpasture Road, Wetherill Park NSW 2164. Wetherill Park is a suburb approximately 30 km west of the Sydney CBD. The site's location is described by Figure 4-1 and Figure 4-2. The existing land is within the Fairfield Local Government Area and Fairfield City Council would be the consent authority for the development.

The subject site is located within an industrial area zoned under the Fairfield City Council Local Environment Plan land zoning map (Zoning Compilation Sheet #45) as Zone 4(a) – Industrial General (refer Figure 4-1). The portion of land immediately west and north of the site is seen to be designated "unzoned" whilst neighbouring premises to the east and south are also located under land zoned as Zone 4(a).

The subject site is approximately 2.1 hectares in area (the site is roughly trapezoidal in shape) with frontage to Cowpasture Road to the west. The site shares its southern and eastern boundaries with neighbouring premises located within the Wetherill Park Industrial Area.

Environmental impacts from the proposed development are predicted to be minimal. Regardless of the magnitude of these impacts, these concerns have been addressed in detail and are discussed throughout the remainder of this document.

Figure 4-1: Surrounding Land-Use Zones




Legend:

1. Non Urban
- 1(a) - Residential
- 1(b) - Extractive Industry
- 1(v) - Village

2. Residential
- 2(a) - A
- 2(a1) - A1
- 2(b) - B

3. Business
- 3(a) - Sub-Regional Centre
- 3(b) - District Centre
- 3(c) - Local Centre

4. Industrial
- 4(a) - General
- 4(b) - Light
- 4(c) - Special

5. Special Uses
- 5(a) - Special Use
- 5(b) - Arterial Road and Widening
- 5(c) - Sub Arterial Road and Widening
- Unzoned - Unzoned

6. Recreation
- 6(a) - Existing and Proposed
- 6(b) - Private
- 6(d) - Tourism

Source: Zoning Compilation, Sheets 37-38 & 45-46, Fairfield LEP 1994, Amendment Date: 18th June 2010

Figure 4-2: Site Location: Regional Context


Source: © DEPARTMENT OF LANDS SIX Portal (www.lands.nsw.gov.au)
Approximate Scale: 1 : 50,834

### 4.1.1 Existing Infrastructure

The site is presently serviced by electricity, telephone lines, mains water and sewerage. These will be utilised as part of the proposed development. The site however would generate very minimal trade waste as wastewater will mostly be fully treated and reused in production.

The existing road network being used by the current operations of the site would be used as part of the proposed development. No upgrades of the road network are currently anticipated and would not affect the proposal.

## 4.2 LOCAL COMMUNITY

This section provides information on the local community and the surrounding areas.

### 4.2.1 Wetherill Park and Surrounds

Wetherill Park is a part of south western Sydney and is approximately 30 km west of the Sydney CBD. It is known to be a home of one of the largest industrial estates in the Southern Hemisphere. Surrounding suburbs include Greystanes, Prospect, Horsley Park, Abbotsbury, Bossley Park, Prairiewood and Smithfield.

### 4.2.2 Population Demographics

The population within Wetherill Park, as determined during the 2006 census conducted by the Australian Bureau of Statistics, was 6,127 people. This figure was lower than past census reports.

With a mixture of cultural backgrounds, including Iraqi, Italian, Vietnamese, Croatian, and Maltese, over 78% of the population of Wetherill Park speak English as their primary language. Approximately 55% of the population are married, of which approximately 36% have children. The median age in Wetherill Park is 35 years, compared with 37 years for an average in Australia. Approximately 91% of the residents in Wetherill Park are employed on full-time, part-time, or on another basis. Occupations comprised of Clerical and Administrative Workers (18.6%), Technicians and Trade Workers (16.7%), Labourers (13.2%), Professionals (11.5%), Sales Workers (10.6%), Machinery Operators and Drivers (10.6%), Managers (8.2%) and Community and Personal Services (7.1%).

In Wetherill Park, 43.4% of the residents owned their homes, 34.7% were in the process of purchasing their homes, and 17.4% were renting.

The above details and figures were sourced from the Australian Bureau of Statistics (ABS, 2006).

### 4.2.3 Nearest Residences

The nearest identified residences to the subject site are considered as part of the "receivers" or "receptors" that need to be assessed in the environmental assessment sections of this document (mainly for noise and air impact assessments). The location of these residences to the subject site is presented in **Error! Reference source not found.** below and is shown in Figure 4-3 as R1 to R9.

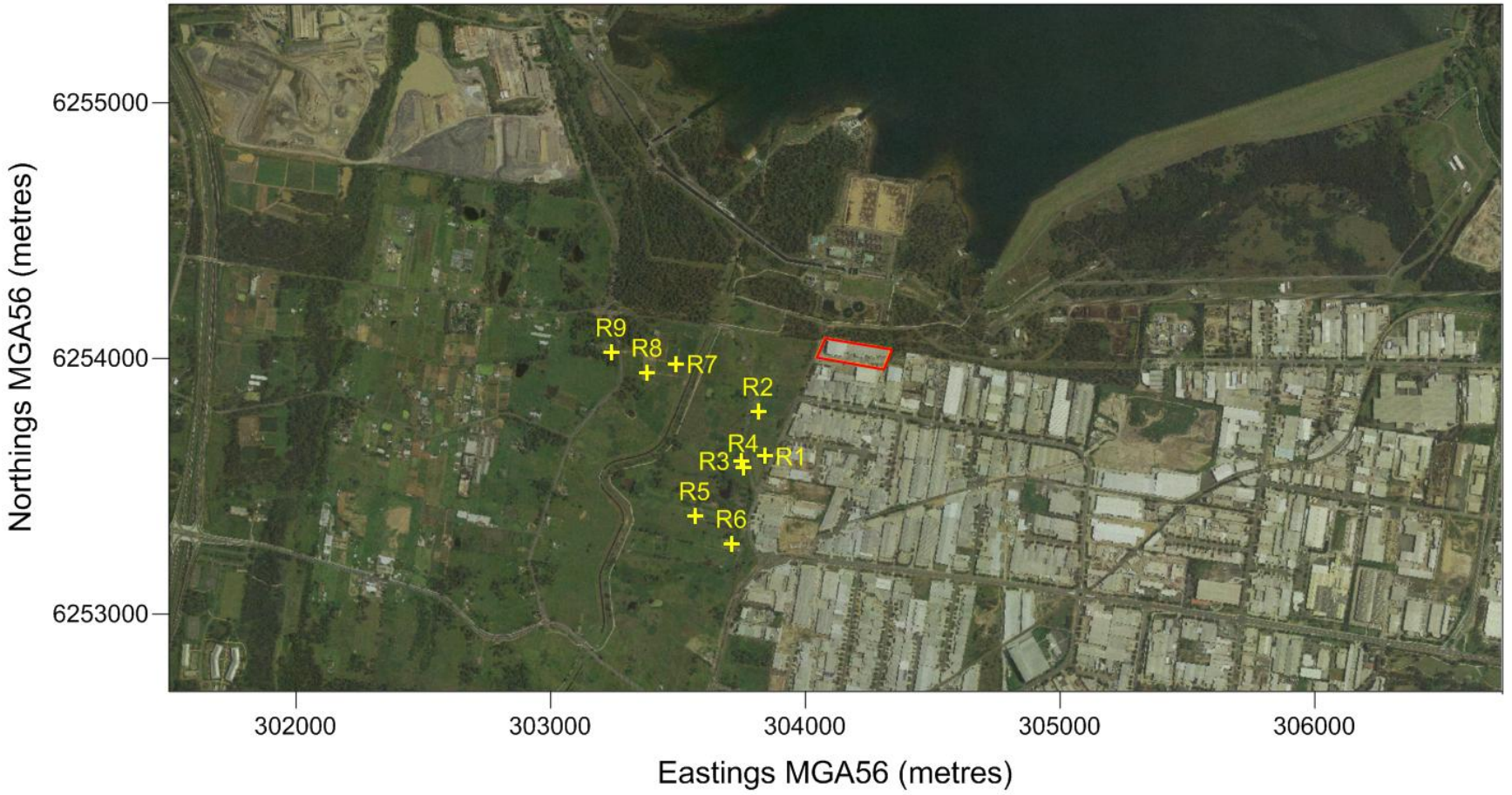
Table 4-1: Nearest Residential Receptors in Wetherill Park

| Receivers | Identification | Approximate Distance to Site Boundary (m) | Bearing |
|---|---|---|---|
| R1 | 28 Trivet Street | 432 | South-West |
| R2 | 38-50 Trivet Street | 314 | South-West |
| R3 | 15-23 Trivet Street | 491 | South-West |
| R4 | 5-13 Trivet Street | 513 | South-West |
| R5 | 132-142 Cowpasture Road | 773 | South-West |
| R6 | 144-154 Cowpasture Road | 795 | South-West |
| R7 | 144-170 Ferrers Road, Lot 39 DP 13961 | 558 | West |
| R8 | 144-170 Ferrers Road, Lot 38A DP 13961 | 672 | West |
| R9 | 127-131 Ferrers Road | 803 | West |
| RA | Prospect Reservoir | 428 | North-East |
| RB | Sydney Water Supply | 275 | North |
| RC | Sydney Water Supply Canal | 425 | North-West |
| RD | Sydney Water Supply Canal | 432 | West |
| RE | Sydney Water Supply Canal | 543 | South-West |

For the noise assessment only, the following receivers necessary to be considered as the operation of the expanded site would be inaudible at the majority of the receivers were:

- R2: 38-50 Trivet Street;
- R3: 15-23 Trivet Street;
- R4: 5-13 Trivet Street; and
- R7: 144-170 Ferrers Road, Lot 39 DP 13961.

Figure 4-3: Residential Receptors Closest to the Site




| Legend: | Source: Department of Lands © 2008, SIX Portal |
|---|---|
| Site Boundary<br>Nearest Residential Receivers | Link: www.lands.nsw.gov.au |

## 4.3 FLORA AND FAUNA

No threatened and endangered species were identified and determined during the assessment of the subject site. The site is an existing industrial premises and the proposed development would be established upon the existing unused land on site. It has been determined that there will be no net loss of flora and fauna species or natural environments that are of high community and environmental significance. Therefore, no detailed flora and fauna studies were found warranted and hence have not been undertaken.

## 4.4 TOPOGRAPHY

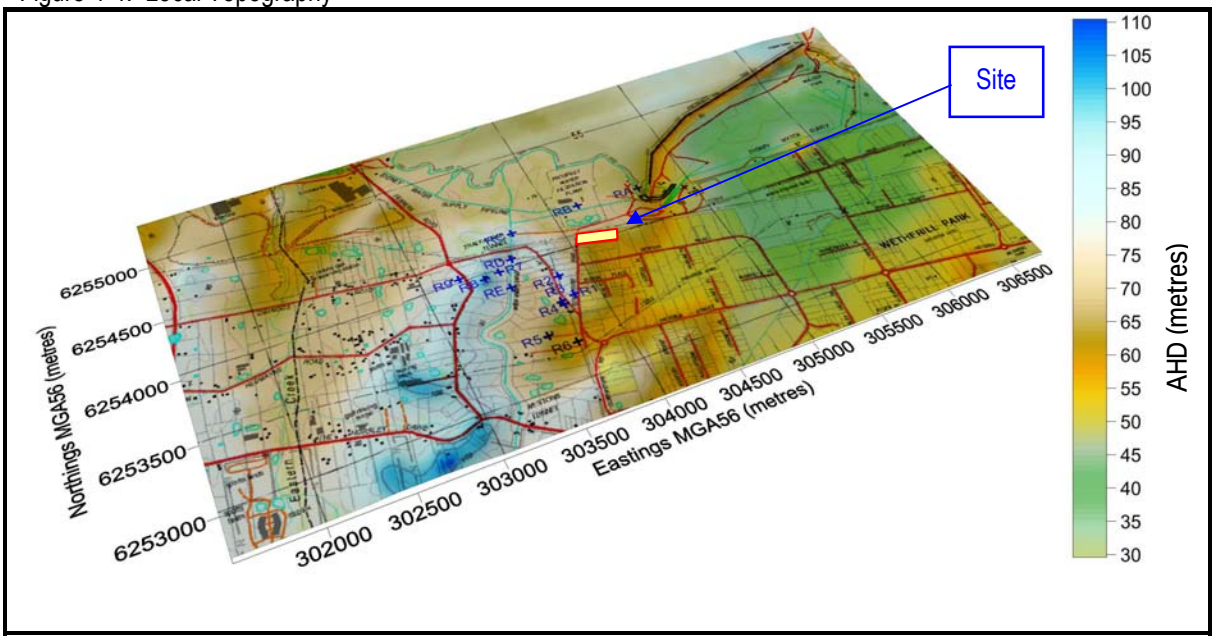
### 4.4.1 Regional and Local Topography

The subject site is located within the Cumberland Plains of Sydney – an area that is typically flat with undulating terrain. Low-lying terrain elevations from approximately 40 m AHD occurs in the local regions north-east of the subject site, close to Prospect Creek that runs from north-east to east of the site.

The highest point of topography is seen to be close to 110 m AHD, which occurs south-west of the subject site near the intersection of Ferrers Road and Horsley Drive (near Horsley Park).

Specifically for the air quality impact section, further analysis is provided in Section 5.2.4.

Figure 4-4: Local Topography



### 4.4.2 Site

The terrain of the subject site is considered relatively flat, with a general elevation of 63 to 66 m AHD along the accessible (via foot) open areas of the site. Areas where on-site buildings are located (along the northern boundary of the site), the terrain elevation ranges from 67 to 69 m AHD.

## 4.5 HYDROLOGY

The following section details the hydrological aspect of the site and region. Specifics on the surface water, waterways and groundwater have been addressed, as well as overall catchment issues.

### 4.5.1 Catchment

The site and the adjoining industrial estate flow to Prospect Creek and in turn into the Georges River Catchment.

The Georges River Catchment covers an area of 1,000 square miles and receives water from across 14 local government areas including Fairfield City Council.

The Department of Planning has developed a number of studies and guidelines to aid local government in their decision making. The Southern Sydney Catchment Blueprint (2002) was reviewed for input into the design of the site.

The Sydney Metropolitan Catchment Management Authority (SMCMA) is the agency within the State Government managing the natural resources potentially affected by industrial development and activities in industrial sites. The SMCMA vision is to achieve healthy waterways and bushland. Of relevance to this proposed development are the healthy waterways. The stormwater management on this site as with the whole of the Smithfield-Wetherill Park Industrial Estate is one of the main contributions that can be made.

Therefore the following are the objectives of the water management on this site:

- Ensure stormwater discharges are uncontaminated and are not contributing a pollution load;
- Maintain a high environmental housekeeping standard in yard areas and especially in trafficked areas;
- Provide safeguards against chemical releases onto hardstand areas;
- Provide means of isolating spillages and being able to isolate the stormwater discharges off site; and
- Ensuring safeguards are maintained.

The Catchment Action Plan (CAP) of this Agency would trigger further considerations and would be included in the updated versions of the Environmental Management Plan for the expanded site.

## 4.6 NOISE AMENITY

The noise impact assessment follows the NSW EPA Industrial Noise Policy. To establish the noise criteria that the development needs to meet the project specific noise limits are established.

These are established by measuring the existing levels of environmental noise at the nearest residential receivers.

The existing levels of noise are measured by two methods.

### Unattended

Unattended noise loggings are typically placed seven days at an accessible residence.

An ARL continuous noise logger was used for this purpose. The instrument was calibrated before use and again after use. There was no excessive drift in the calibration.

The microphone with a windsock in place was placed at 1.2 m above the ground surface and away from reflective surfaces.

The noise logger provides 15 minute statistical noise levels of the following descriptors:

- $L_{A90}$

  This is equivalent to the minimum of the lowest noise levels that occurred.

- $L_{A10}$

  This is equivalent to an average of the maximum.

- $L_{Aeq}$ 15 minute

  This represents the equivalent continuous A weighted sound pressure level over 15 minutes.

The sources of noise that are measured using a noise logger will include community activities, naturally occurring noise sources (eg birds, insects, movement of vegetation), transport activities if roadways are nearby and industrial/commercial activities.

The noise logger results are presented in a graph form in the Attachments (Attachment 5).

The 15 minute results are summarised in table format.

In assessing the background noise levels any data affected by adverse weather conditions has been discarded according to the requirements of the NSWINP. The weather data was accessed from the Bureau of Meteorology.

One of the principal reasons to undertake noise logger is to determine the Rating Background level. This is discussed below in Section 4.6.1 and is used to determine the Intrusiveness Noise Criteria discussed in Section 5.1.3.1.

### Attended

Attended noise measurements are undertaken over 15 minute periods for the periods of time the development would operate.

For this development this required day, evening and night time measurements to be monitored.

Attended monitoring enables the source of the noise levels to be clearly identified.

One of the prime purposes of attending monitoring is to identify the level of noise from industry.

The purpose of determining the existing contribution from industry is to establish the Amenity Noise Criteria discussed in Section 5.1.3.2.

The outcome of determining the Intrusiveness and Amenity criteria noise levels as noted earlier are the Project Specific Noise Criteria for the proposed development.

### 4.6.1 Background Noise Levels

A background noise level or rating background level (RBL) assessment representing the day, evening and night periods was conducted on 20th July 2010 to 28th July 2010 inclusive. The resultant data is based on the median of individuals assessment background level's (ABL's) determined over the entire monitoring period and is considered representative of the background noise levels for the area.

Table 4–3 summarises the existing RBL and amenity levels for each day, evening and night time period, in accordance with the NSW INP.

Table 4-2: Measured Noise Levels – 5 - 13 Trivet Street (dB(A)) Location R4

| | Average $L_{A1}$ | | | Average $L_{A10}$ | | | ABL ($L_{A90}$) | | | $L_{Aeq}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | Evening | Night | Day | Evening | Night | Day | Evening | Night | Day | Evening | Night |
| Tues 20/07/10 | 75 | 72 | 69 | 69 | 62 | 56 | 50 | 44 | 41 | 66 | 60 | 58 |
| Wed 21/07/10 | 74 | 71 | 69 | 68 | 63 | 58 | 46 | 45 | 40 | 66 | 61 | 60 |
| Thu 22/07/10 | 74 | 70 | 68 | 68 | 61 | 57 | 52 | 46 | 41 | 65 | 60 | 59 |
| Fri 23/07/10 | 74 | 70 | * | 68 | 61 | * | 50 | 44 | * | 64 | 60 | * |
| Sat 24/07/10 | 71 | 67 | 66 | 63 | 54 | 52 | 40 | 41 | 40 | 60 | 56 | 55 |
| Sun 25/07/10 | 70 | * | * | 59 | * | * | 41 | * | * | 59 | * | * |
| Mon 26/07/10 | 74 | 71 | 69 | 69 | 61 | 59 | 50 | 47 | 46 | 65 | 61 | 60 |
| Tues 27/07/10 | 74 | 72 | 68 | 68 | 62 | 57 | 47 | 44 | 44 | 65 | 61 | 59 |
| Wed 28/07/10 | 73 | * | 68 | 69 | * | 57 | 53 | * | 45 | 65 | * | 59 |
| | | | | | | | | | | | | |
| Average | 73 | 70 | 68 | 67 | 61 | 57 | | | | | | |
| Median (RBL) | | | | | | | 50 | 44 | 41 | | | |
| Logarithmic Average | | | | | | | | | | 64 | 60 | 59 |

Notes: *Indicates periods of inclement weather which nullifies the noise levels for that period.
Bolded data – used to calculate project specific noise level criteria.

The Rating Background Levels for the three periods of the day show that:

- $L_{A90}$ daytime is 50 dB(A);
- $L_{A90}$ evening is 44 dB(A); and
- $L_{A90}$ night time is 41 dB(A).

| Table 4-3: Attended Monitoring Conducted on 24 September 2010 (dB(A)) | | | | |
|---|---|---|---|---|
| Location | | Measured $L_{A90}$ | Measured $L_{Aeq}$ | Comments |
| Front Boundary of Site | Evening 9:00pm | 42.0 | 46.5 | With Nearby Insects ≤ 45 dB(A)<br>Distant Insects ≤ 42.5 dB(A)<br>Aeroplane pass ≤ 59 dB(A)<br>Van at end of street ≤ 49 dB(A)<br>Steady state industry noise from adjacent site.<br>Clear, still evening. |
| | Night 10:00pm | 42.2 | 43.6 | Distant Insects ≤ 43 dB(A)<br>Dog Barking ≤ 44.5 dB(A)<br>Car at end of street ≤ 46 dB(A)<br>Distant truck ≤ 49.5 dB(A)<br>Steady state industry noise from adjacent site.<br>Clear, still evening. |
| 5 - 13 Trivett St | Day 1:20pm | 48.9 | 64.1 | Industrial noise from the site not audible.<br>Main sources hum of traffic and industry, rustle of vegetation, local traffic, general community activity.<br>Industry contribution ≤ 49 dB(A). |
| | Evening 9:30pm | 39.7 | 63.7 | With Insects ≤ 40 dB(A)<br>Car Pass ≤ 85 dB(A)<br>Distant Car ≤ 53 dB(A)<br>Frequent car pass bys.<br>Industrial noise inaudible.<br>Clear, still evening. |
| | Night 10:20pm | 40.7 | 53.3 | With Insects ≤ 43 dB(A)<br>Car pass ≤ 75 dB(A)<br>Low level industry or distant traffic noise ≤ 41 dB(A)<br>Frequent car pass bys.<br>Clear, still evening. |

The attended noise monitoring shows the following contribution from industry:

- Daytime to 49 dB(A);
- Evening < 40 dB(A) 35 dB(A) has been adapted as the level from industry; and
- Night < 41 dB(A) 35 dB(A) has been adapted as the level from industry.

## 4.7 AIR QUALITY

### 4.7.1 Background Air Quality

The air quality in the regional area of interest is primarily affected by exhaust emissions from road traffic and industrial emissions from the neighbouring premises residing in the Wetherill Park industrial area. Particulates in the area are caused by these air emission sources. Wind also affects the air quality of the region, albeit to a lesser extent.

Particulates are considered to be one of the air quality indicators. Table 4-2 shows a summary of the air quality, which was the most recent set of data referenced from the NSW Department of Environment, Climate Change and Water (DECCW) monitoring station at William Lawson Park, Prospect. Monitoring stations such as this record background concentrations of major pollutants of concern and have been established for the purposes of monitoring Australia's goals with the nationally-recognised limits called the Environment Protection Measures (NEPMs). The DECCW Prospect monitoring station has been referenced, as it was found to be the closest monitoring station to Wetherill Park.

| Table 4-2: Existing Air Quality Data from DECCW Quarterly Monitoring Reports – Prospect | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pollutant and Averaging Time | | Background Concentrations (μg/m³) | | | | | | | | | | | | |
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Av. |
| $PM_{10}$ | Av. All Hours | - | - | 18 | 21 | 21 | 14 | 14 | 15 | 18 | 26 | 16 | 17 | 18 |
| | 1-Hour Maxima | - | - | 29 | 42 | 45 | 26 | 26 | 30 | 34 | 47 | 34 | 27 | 34 |

Source: DECCW, 2007

The NEPM limits are provided in Table 4-3. These goals were designed based on the desired outcomes of *(a) protection of human health, (b) preservation of ecosystems, and/or (c) restoration of water quality to support aquaculture*. The applicable pollutant has been highlighted in the table.

| Table 4-3: Ambient Air Quality NEPM Goals | | | |
|---|---|---|---|
| Pollutants | Averaging Period | Maximum Concentration | Goal within 10 years Maximum allowable exceedances |
| Nitrogen Dioxide | 1 hour<br>1 year | 12 pphm<br>3 pphm | 1 day a year<br>None |
| Sulphur Dioxide | 1 day<br>1 year | 8 pphm<br>2 pphm | 1 day a year<br>None |
| Carbon Monoxide | 8 hours | 9 ppm | 1 day a year |
| $PM_{10}$ | 1 day | 50 μg/m³ | 5 days a year |

The referenced NEPM limit has not been exceeded throughout the available and most recent data recorded from the Prospect monitoring station.

## 4.8 CLIMATE

This section will provide background information on the meteorological condition of the existing area surrounding the proposed site. This referenced meteorological information has been sourced from the Bureau of Meteorology (BoM) monitoring station at Horsley Park (Horsley Park Equestrian Centre AWS, Station No. 67119). This station is located approximately 3 km south-west of the subject site and is considered suitable for reference to climate conditions in the local area.

### 4.8.1 Temperature

Temperature statistics have been referenced from the Horsley Park Equestrian Centre AWS. This data is shown in Table 4-4.

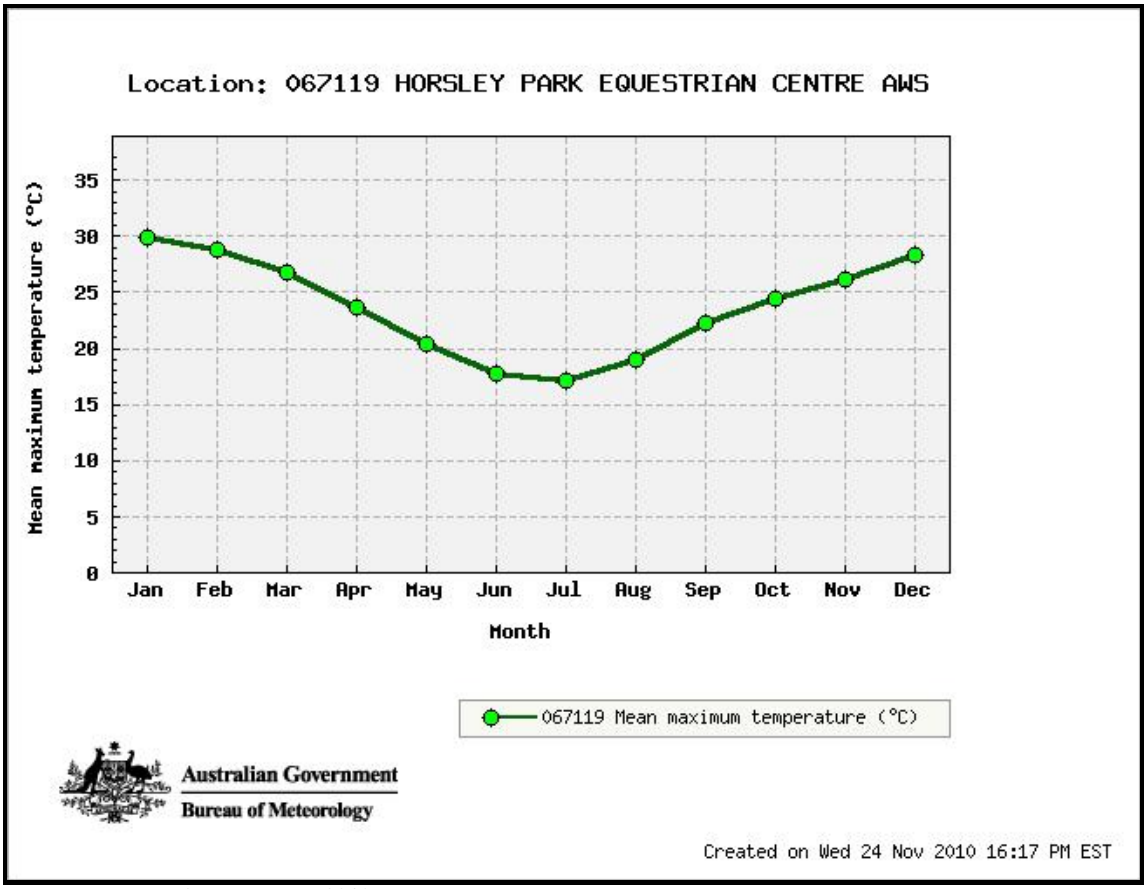
The mean annual temperature at Horsley Park Equestrian Centre AWS ranges between 16.1°C and 28.3°C. The lowest temperatures occur in July where the average temperature ranges between 5.9°C and 17.1°C. The hottest temperatures are recorded in January when temperatures reach an average maximum of 29.9°C.

Table 4-4: Temperature Statistics from Bureau of Meteorology – Horsley Park Equestrian Centre AWS

| Months / Parameter | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Maximum Temperature (°C) | 29.9 | 28.8 | 26.8 | 23.7 | 20.4 | 17.7 | 17.1 | 19.0 | 22.3 | 24.4 | 26.2 | 28.3 | 23.7 |
| Mean Minimum Temperature | 17.7 | 17.8 | 15.9 | 12.8 | 9.1 | 6.9 | 5.9 | 6.5 | 9.4 | 11.7 | 14.3 | 16.1 | 12.0 |

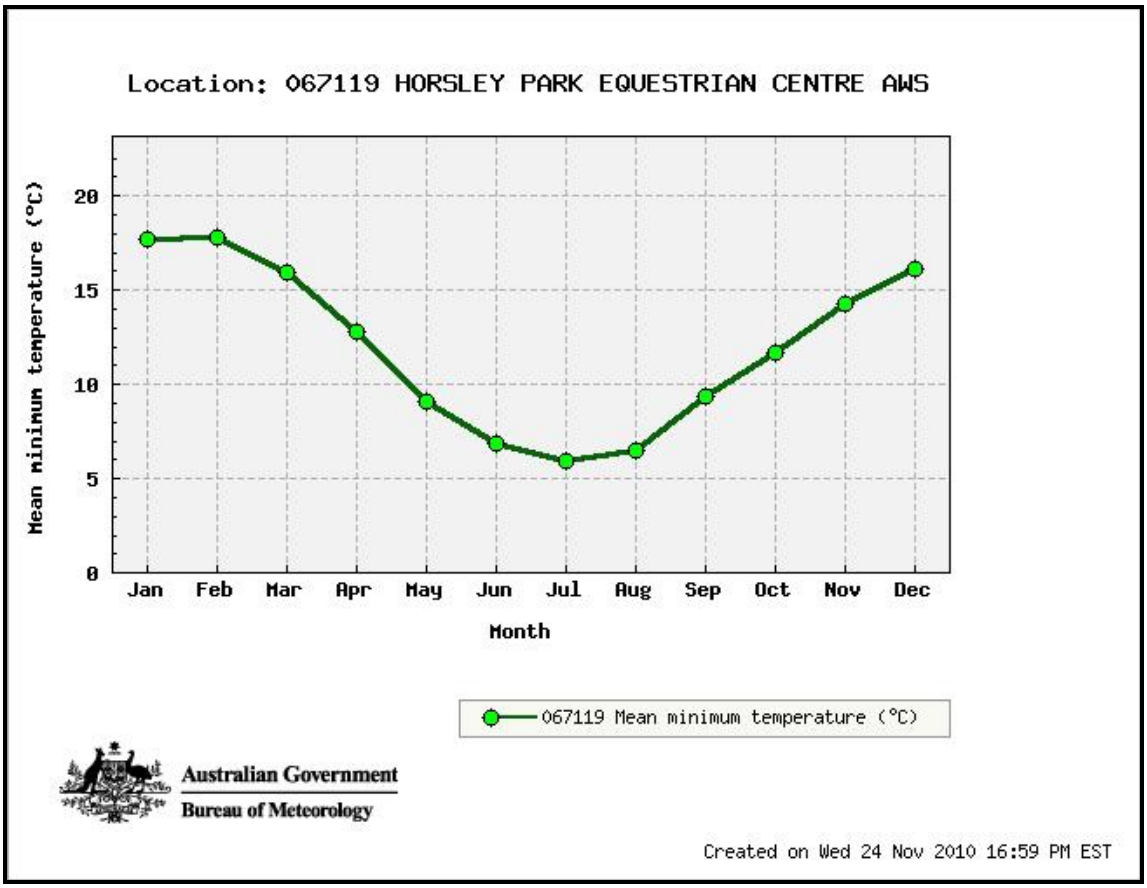
Source: Bureau of Meteorology, 2010
Note: Statistics are based on data collected from the Year 1997 to 2010

Figure 4-5: Mean Maximum Temperature from Horsley Park Equestrian Centre AWS




Source: Bureau of Meteorology, 2010

Figure 4-6: Mean Minimum Temperature from Horsley Park Equestrian Centre AWS




Source: Bureau of Meteorology, 2010

### 4.8.2 Rainfall

The rainfall statistics have been referenced from the BoM Horsley Park Equestrian Centre AWS. This data is shown in Table 4-5.

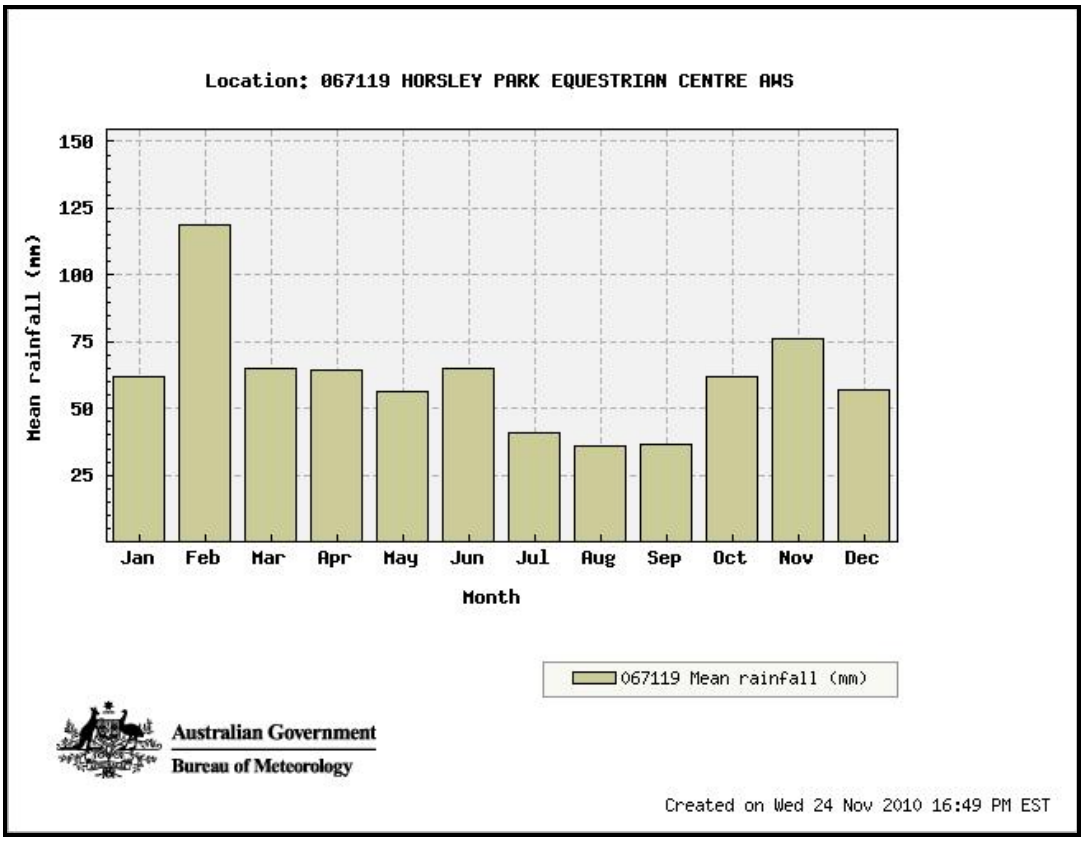
Rainfall data collected by the Horsley Park Equestrian Centre AWS shows mean rainfall of 61.7 mm using the average of the monthly mean rainfall data. February is the wettest month, where mean a rainfall reading is averaged as 118.8 mm. The mean annual rainfall is 740.1 mm. The annual mean number of rainy days (with rainfall above 1mm) is calculated as 76.8 days.

Table 4-5: Rainfall Statistics from Bureau of Meteorology – Horsley Park Equestrian Centre AWS

| Months / Parameter | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Rainfall (mm) | 61.9 | 118.8 | 65.2 | 64.3 | 56.4 | 64.8 | 41.2 | 35.9 | 36.4 | 61.7 | 76.4 | 57.1 | 740.1 |
| Decile 5 (Median) Rainfall (mm) | 64.2 | 94.4 | 53.8 | 64.2 | 37.4 | 50.2 | 35.0 | 26.6 | 34.2 | 47.6 | 57.2 | 63.8 | 695.3 |
| Mean Number of Days of Rain ≥ 1 mm | 7.5 | 7.6 | 7.2 | 6.9 | 6.2 | 6.2 | 5.9 | 4.5 | 5.1 | 5.9 | 7.1 | 6.7 | 76.8 |

Source: Bureau of Meteorology, 2010
Note: Statistics are based on data collected from the Year 1997 to 2010

Figure 4-7: Mean Rainfall from Horsley Park Equestrian Centre AWS



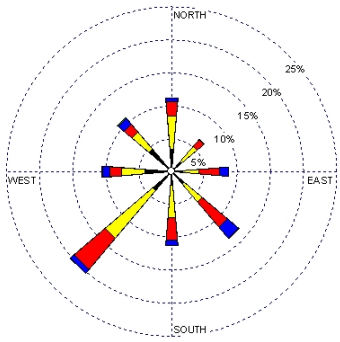
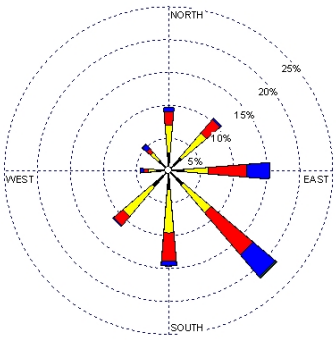
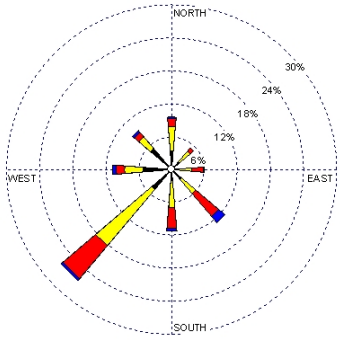
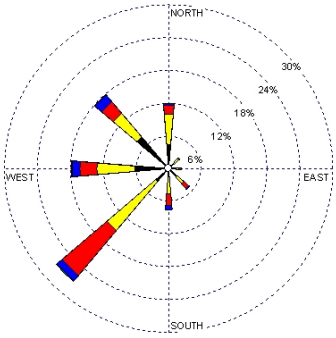
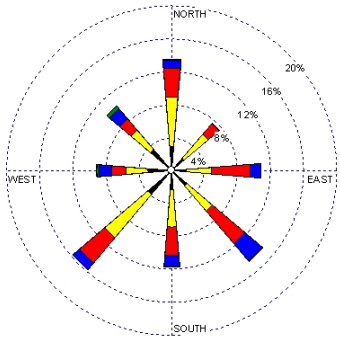
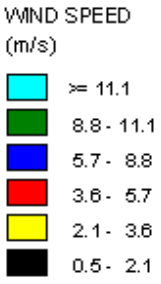

Source: Bureau of Meteorology, 2010

### 4.8.3 Wind

Winds experienced within the local area of the subject site mostly originate from southeast throughout the year based on recent data from the Bureau of Meteorology's monitoring station at Horsley Park (Station Name: Horsley Park Equestrian Centre AWS, Station No. 67119). Wind rose plots shown in Figure 4-7 highlight the dominance of South Easterly winds.

Wind rose plots show the direction from which the wind is coming from with triangles known as "petals". The petals of the plots in the figure summarise wind direction data into 8 compass directions i.e. north, north-east, east, south-east, etc. The length of the triangles, or "petals", indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class. The proportion of time, for which wind speed is less than speeds in the first class (i.e. 0.5 m/s), when speed is negligible, is referred to as calm hours or "calms". Calms are not shown on a wind rose as these have no direction, but the proportion of time that constitutes the period under consideration is noted under each wind rose.

Figure 4-8: Annual Wind Rose Plots from Year 2005 to 2009 – Horsley Park Equestrian Centre

| All Seasons | Summer (December – February) |
|---|---|
|  |  |
| Average Wind Speed: 3.06 m/s<br>Calms Frequency: 7.52 %<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% | Average Wind Speed: 3.27 m/s<br>Calms Frequency: 7.29 %<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |
| **Autumn (March – May)** | **Winter (June – August)** |
|  |  |
| Average Wind Speed: 2.79 m/s<br>Calms Frequency: 8.58 %<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% | Average Wind Speed: 2.88 m/s<br>Calms Frequency: 7.54 %<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% |
| **Spring (September – November)** | **Legend** |
|  |  |
| Average Wind Speed: 3.31 m/s<br>Calms Frequency: 6.64 %<br>Axis Frequencies: 4%, 8%, 12%, 16%, 20% | |

Note: Calms are defined as wind events that occur at a wind speed of equal to or less than 0.5 m/s.

Throughout the course of a year, Figure 4-8 shows that southwest winds dominate at a frequency close to 20%. The 2005-2009 data shows increased frequency of winds from the southeast close to 20%.

In summer, winds from the southeast dominate at a frequency of 22%. During autumn, winds from the southwest dominate at a frequency of 26% for this wind direction. In winter, the long term data shows the continued dominance of southwest winds at a frequency of 26%. In spring, the data shows dominance of winds from the south-east (14%) and south-west (16%) with other wind directions having frequencies less than these figures.

The meteorological characteristics have been referenced in undertaking the noise and air modelling of the proposed development. Specifically for the air modelling, further analysis is provided in Section 5.2.3.

# 5. ENVIRONMENTAL IMPACTS AND SAFEGUARDS – PHYSICAL ENVIRONMENT

## 5.1 NOISE

This section of the EIS addresses the potential environmental impacts of each of the activities of the proposed development.

The assessment uses recognised modelling methods for noise and air emissions. The assessment includes the presence of safeguards that have been developed during the design of the proposed development to predict the physical environment and to ensure that DECCW criteria for noise and are satisfied. This section of the EIS also addresses other issues that may arise such as waste management, surface and groundwater and soil impacts.

### 5.1.1 Background Information

This section details the Noise Impact Assessment and follows the scope as outlined below.

- Establish the Project Specific Noise Limits

To establish the Project Specific Noise Limits the NSWINP noise criteria are detailed and then applied from the existing noise levels presented in Section 4.

- Obtain noise source data from similar plant and equipment.

This was obtained from other projects completed by Benbow Environmental at concrete plants that use central mixers and similar materials handling equipment.

- Establish the noise model for the site using the terrain and meteorological conditions that exist.

Receiver locations shown in Section 5.4 were also used however only the few nearest receivers R2, R3, R4 and R7 needed to be assessed as the site and the proposed development would be inaudible at all others.

- Run the Sound Plan Model for the full activities of the site during daytime, evening and night time.

The assumptions used in the modelling are presented. The predicted noise levels are then shown in tabular form and as noise contours.

- Model the main scenarios and compare the predicted noise levels to the Project Specific Noise Limits.

The scenarios modelled are discussed and included noise enhancing weather conditions.

- The potential construction noise emissions are discussed.

- The potential road traffic is discussed but as there will be a net reduction in truck numbers a fuller assessment has not been considered warranted.

### 5.1.2 Noise Criteria for the Proposed Development

The assessment procedure in terms of the NSWINP has two components:

- Controlling intrusive noise impacts in the short-term for residences; and
- Maintaining noise level amenity for residences and other land uses.

#### 5.1.2.1 Intrusive Noise Impacts

According to the NSW INP, the intrusiveness of a mechanical noise source may generally be considered acceptable if the equivalent continuous (energy saving) A-weighted level of noise from the source (represented by the $L_{Aeq}$ descriptor), measured over a 15 minute period, does not exceed the background noise level measured in the absence of the source by more the 5 dB(A).

The intrusiveness criterion is summarised as follows:

$L_{Aeq,}$ 15 minute $\leq L_{A90}$ background noise level plus 5 dB(A)

The intrusiveness criteria for each assessment location are presented in Table 5-1.

Table 5-1: Intrusiveness Criteria – Nearest Receivers

| Period | | Intrusiveness Criteria at Nearest Receivers, dB(A) | | | |
|---|---|---|---|---|---|
| | | R2 | R3 | R4 | R7 |
| Day[1] | $L_{Aeq}$ 15 min | 50 + 5 = 55 | 50 + 5 = 55 | 50 + 5 = 55 | 50 + 5 = 55 |
| Evening[2] | $L_{Aeq}$ 15 min | 44 + 5 = 49 | 44 + 5 = 49 | 44 + 5 = 49 | 44 + 5 = 49 |
| Night[3] | $L_{Aeq}$ 15 min | 41 + 5 = 46 | 41 + 5 = 46 | 41 + 5 = 46 | 41 + 5 = 46 |

Notes: [1]Day is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays.
[2]Evening is defined as 6.00pm to 10.00 Monday to Sunday and Public Holidays.
[3]Night time is defined as 10.00pm to 7.00am, Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

The intrusiveness criteria were based on the rating background levels measured at one of the nearest receivers. An examination of these receivers during placement of the noise logger shown that similar noise levels were present and that the proposed development will be a low risk of generating excessive noise levels.

#### 5.1.2.2 Protecting Noise Amenity

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the NSW INP, the applicable parts of which are reproduced in Table 5-22.

At present the nearest residences are well separated and would not be considered to be in an Urban area but Suburban. Future land development may change the land use type to Urban. The existing land use is not considered to be Rural due to the levels of traffic and presence of the Wetherill Park Industrial Estate.

Table 5-2: Amenity Criteria – Recommended $L_{Aeq}$ Noise Levels from Industrial Sources

| Type of Receiver | Indicative Noise Amenity Area | Time of Day | Recommended $L_{Aeq}$ Noise Levels, dB(A) | |
|---|---|---|---|---|
| | | | Acceptable | Recommended Maximum |
| Residence | Suburban | Day | 55 | 60 |
| | | Evening | 45 | 50 |
| | | Night | 40 | 45 |

The existing noise levels are compared to the acceptable level and Table 5-3 is used to derive the amenity criteria.

Table 5-3: Modification to Acceptable Noise Level (ANL[1]) to Account for Existing Level of Stationary Noise

| Total Existing $L_{Aeq}$ Noise Level From Industrial Sources | Maximum $L_{Aeq}$ Noise Level for Noise from New Sources Alone |
|---|---|
| ≥ ANL + 2 | If existing noise level is likely to decrease in future: ANL – 10<br>If existing noise level is unlikely to decrease in the future: Existing level – 10 |
| ANL + 1 | ANL – 9 |
| ANL | ANL – 8 |
| ANL –1 | ANL - 6 |
| ANL – 2 | ANL – 4 |
| ANL – 3 | ANL – 3 |
| ANL – 4 | ANL – 2 |
| ANL – 5 | ANL –2 |
| ANL – 6 | ANL – 1 |
| < ANL - 6 | ANL |

Source: Table 2.2 NSW EPA INP
Note: [1]ANL is the recommended acceptable $L_{Aeq}$ noise level for the specific receiver, area and time of day.

The measured amenity noise levels are shown in Table 5-4. It should be noted that the measured level includes noise from nearby traffic, which should not be used in determining the amenity noise level. The amenity noise level is intended to indicate the magnitude of industrial noise.

The amenity noise levels were assessed based on the industry contribution in the evening and night time being 35 dB(A) as it was inaudible. This is considered to be reasonable and conservative.

Table 5-4: Measured Amenity Noise Levels (dB(A))

| Location | | Measured $L_{Aeq,}$ | Estimated Industrial Noise | Acceptable Noise Level | Amenity Criteria |
|---|---|---|---|---|---|
| R3 | Day | 49 | 49 | 55 | 54 |
| | Evening | 40 | <40 | 45 | 45 |
| | Night | 41 | <41 | 40 | 38 |

*5.1.2.2.1 'Modifying Factor' Adjustments*

Further to the above, where the character of the noise in question is assessed as particularly annoying (i.e. if it has an inherently tonal, low frequency, impulsive or intermittent character), then an adjustment of 5 dB(A) for each annoyance aspect, up to a total of 10 dB(A), is to be added to the measured value to penalise the noise for its potential increase in annoyance.

Table 4.1 of Chapter 4 of the NSW INP provides definitive procedures for determining whether a penalty or adjustment should be applied for increased annoyance. Specifically for tonal noise, a one-third octave (or narrow band analysis) is required and a 5 dB(A) penalty is applied to the measured or predicted level when the level of on-third octave band exceeds the level of the adjacent bands on both sides by:

- 5 dB(A) or more if the centre frequency of the band containing the tone is above 400 Hz;
- 8 dB(A) or more if the centre frequency of the bank containing the tone is 160 to 400 Hz inclusive; and
- 15 dB(A) or more if the centre frequency of the band containing the tone is below 160 Hz.

Noise emissions from this development's operations are determined not to be tonal or impulsive in character once all the noise control recommendations are fully implemented, and therefore this penalty does not apply.

*5.1.2.2.2 Project Specific Noise Levels*

By comparing the intrusiveness with the amenity criteria, and selecting the most stringent criteria for day, evening and night time periods, the calculated project specific noise levels (PSNL) (noise criteria) are presented in Table 5-5.

| Table 5-5: Project Specific Noise Levels | | | |
|---|---|---|---|
| Location | PSNL (Criteria) (dB(A)) | | |
| | Daytime | Evening | Night time |
| R2 | 54 | 45 | 38 |
| R3* | 54 | 45 | 38 |
| R4 | 54 | 45 | 38 |
| R7 | 54 | 45 | 38 |

Note: *Denotes noise-monitoring location

#### 5.1.2.3 Vibration Criteria

Vibration has not been considered relevant to this assessment.

#### 5.1.2.4 Interim Construction Noise Criteria

The following limits apply:

Level Restrictions

The relevant noise limits have been tabulated below.

| Table 5-6: Interim Construction Noise Criteria – Standard Hours | | |
|---|---|---|
| Construction Period | Assessment Descriptor | Planning Level |
| Up to 6 months | $L_{Aeq}$ | $L_{A90}$ +10 dB(A) = 60 |

Source: Interim Construction Noise Guidelines

Time Restrictions

The Interim Construction Noise Criteria states the following time restrictions generally apply:

- 7.00am-6.00pm, Monday to Friday;
- 7.00am-1.00pm, Saturday, if inaudible at residential premises, otherwise 8.00am-1.00pm; and
- No construction work to take place on Sundays or Public Holidays.

When the facades enclosing the proposed development are in place, electrical wiring, plumbing and assembly work of the mechanical plant could occur into the evening without being audible. During outside recommended hours the construction noise levels could not exceed 46 dB(A).

#### 5.1.2.5 NSW EPA Environmental Criteria for Road Traffic Noise

It is expected that there would be a decrease in the contribution to existing traffic noise levels from the site as a result of the proposed development.

The NSW "Environmental Criteria for Road Traffic Noise" (ECRTN, Environmental Protection Authority, 1999) is presented below for completeness. A traffic noise assessment has not been considered to be warranted.

Table 1 of the ECRTN 'Road traffic noise criteria for proposed road or residential land use development' sets out the criteria to be applied to particular types of road and land uses.

The category that is relevant to the proposed development is shown in Table 5-7.

Table 5-7: NSW Environmental Criteria for Road Traffic Noise (ECRTN)

| Type of Development | Criteria | | |
|---|---|---|---|
| | Day (7am-10pm) | Night (10pm-7am) | Where criteria are already exceeded |
| 13. Land use developments with potential to create additional traffic on collector road | $L_{Aeq(15\ hr)}$ 55 dB(A) | $L_{Aeq(9\ hr)}$ 50 dB(A) | Where feasible and reasonable, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; reducing convoying; using 'quiet' vehicles; and using barriers and acoustic treatment.<br><br>In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB(A). |

The road traffic noise criteria would be to limit the increase in road traffic noise to less than 2 dB(A). As there will be a reduction in truck numbers accessing the site there would be no increase in traffic noise levels. Truck deliveries of raw materials would be limited to daytime hours.

### 5.1.3 Predicted Noise Levels

Benbow Environmental noise source data base and the Department of Environment Food and Rural Affairs "*Update of Noise Database for Prediction of Noise on Construction and Open Site*" were used as sources for noise levels used in this report.

#### 5.1.3.1 Noise Sources

Noise source data was obtained from similar concrete plants with central mixers. A plant at Artarmon previously studied by Benbow Environmental was used to provide the noise data.

The unloading of trucks during delivery of aggregate and sand was based on this operation occurring into an inground metal hopper lined with rubber to avoid impact noise.

The unloading of cement and flyash is based on a current best industry standard road tanker. The additional blower needed to transfer the cement and flyash is of the silenced type mounted inside a noise enclosure. The air inlet of the blower is silenced to achieve the noise levels shown in the table below.

Table 5-8: Noise Sound Power Levels ($L_{Aeq}$)

| Noise Source | Sound Power Level (dB(A)) |
|---|---|
| Truck Manoeuvring | 102 |
| Truck Break Air Release | 111 |
| Truck Idling | 103 |
| Aggregate Delivery | 93 |
| Cement Delivery | 92 |
| Transfer Conveyor | 95 |
| Material Elevator | 95 |
| Total Level (1st Building) | 98 |
| Total Level (2nd Building) | 102 |

The locations of noise sources for each model scenario were based on the proposed plant and the following assumptions.

### Aggregate Delivery

- Four trucks per hour during the day (7 am to 6 pm). Two truck noise sources (engine 1.5m and exhaust 3m);
- Each truck air release from braking during 15 sec (1m height);
- Each truck idling during 15 minutes (1m height);
- Truck in during 1.5 minute;
- Truck out during 2 minute; and
- Aggregate delivery during 10 minutes (1m height).

### Cement/Flyash Delivery

- One truck per hour during the day (7 am to 6 pm). Two truck noise sources (engine 1.5m and exhaust 3m);
- Each truck air release from braking during 15 sec (1m height);
- Each truck idling during 15 minutes (1m height);
- Truck in during 1.5 minute;
- Truck out during 2 minute;
- Cement/flyash delivery during 10 minutes (1m height);
- Elevator works during the day 40 minutes per hour;
- 1st Silos Building. Material: Spandek 0.48mm - Rw 21;
  - Sources: First and Second Conveyor; and
  - During 40 minutes per hour (7am to 6am);
- Third conveyor (free field) during 60 minutes 24 hours;
- Second Silos Building. Material: Concrete 100mm – Rw 50;

- Sources: 3 Transfer Conveyors;
- Two Aggregate deliveries;
- Two Cement deliveries; and
- Two mixers operating.

#### 5.1.3.2 Methodology

##### *5.1.3.2.1 Noise Model – SoundPLAN V7 (Concawe Noise Model)*

Noise emissions from the facility were modelled using SoundPLAN Version 7. The model has been extensively utilised by Benbow Environmental and is recognised by regulatory authorities throughout Australia. For this project the model will analyse the local topography, buildings, noise control berms, excavation pits and noise, and emissions.

The modelling scenario has been carried out using the $L_{Aeq}$ descriptor.

The modelling results presented are those with noise controls in place.

##### *5.1.3.2.2 Meteorological Conditions*

Guidance provided by the Industrial Noise Policy indicates that inversion effects do not need to be taken into account if the facility does not operate during night time hours. The policy also indicates that wind effects need to be modelled when the wind speed from source to receiver is less than or equal to 3 m/s for 30% or more of the time in any season for each assessment period (day, evening and night). Bureau of Meteorology data from the Horsley Park monitoring station for 2005 to 2009 was used to generate wind roses for each season during daytime, evening and night time. The wind roses are presented in the Figure 5-1, Figure 5-2 and Figure 5-3.

Figure 5-1: Wind Rose Plots of Day Time Period for the Referenced Meteorological Station - Bureau of Meteorology – The Horsley Park (2005-2009)

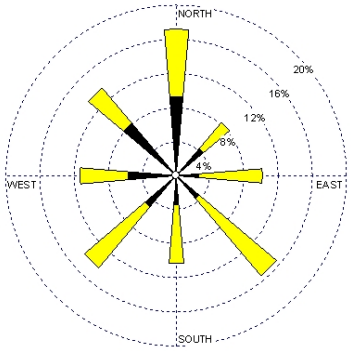
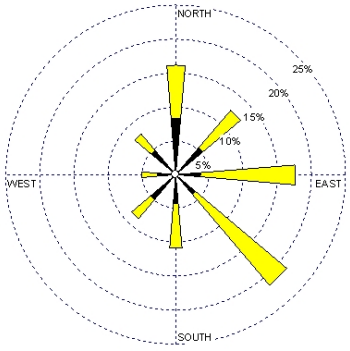
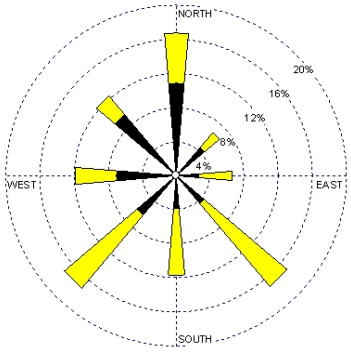
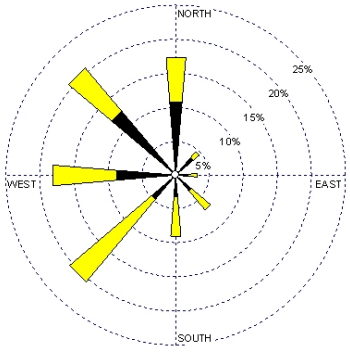
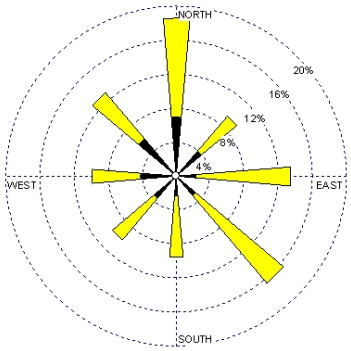
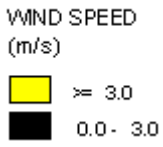
| All Seasons | Summer (December – February) |
|---|---|
|  <br>Average Wind Speed: 3.60 m/s<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |  <br>Average Wind Speed: 3.76 m/s<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |
| **Autumn (March – May)** | **Winter (June – August)** |
|  <br>Average Wind Speed: 3.23 m/s<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% |  <br>Average Wind Speed: 3.33 m/s<br>Axis Frequencies: 7%, 14%, 21%, 28%, 35% |
| **Spring (September – November)** | **Legend** |
|  <br>Average Wind Speed: 4.12 m/s<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |  |

Figure 5-2: Wind Rose Plots of Evening Time Period for the Referenced Meteorological Station - Bureau of Meteorology – The Horsley Park (2005-2009)

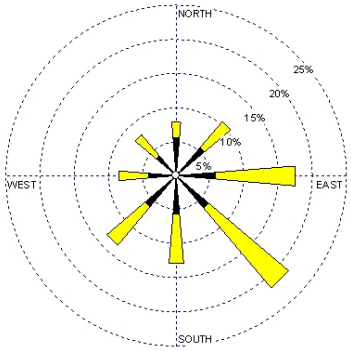
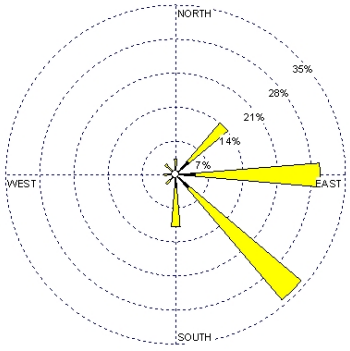
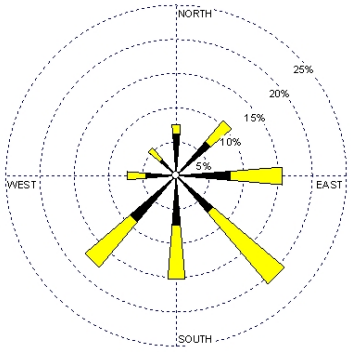
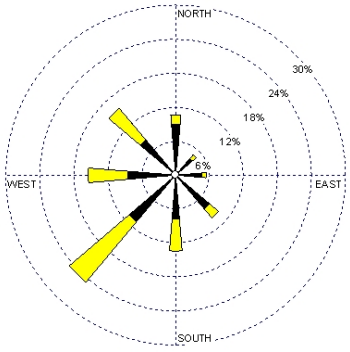
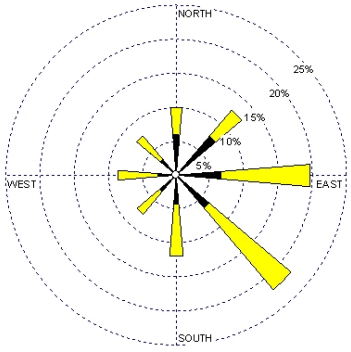
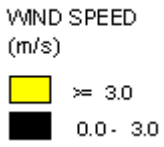
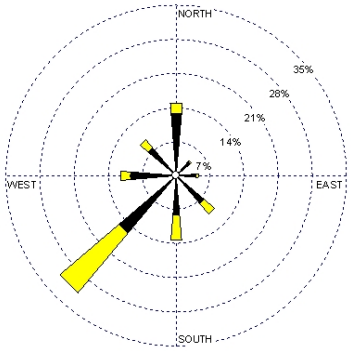
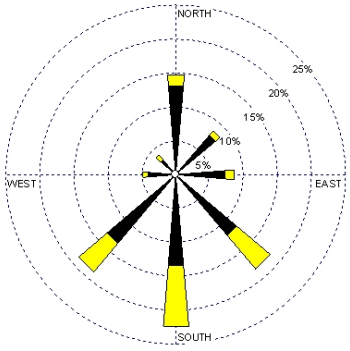
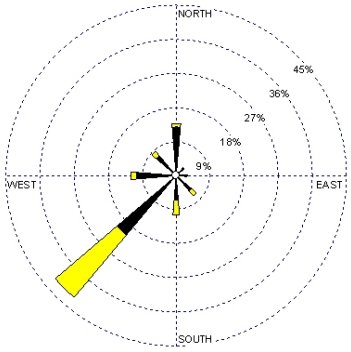
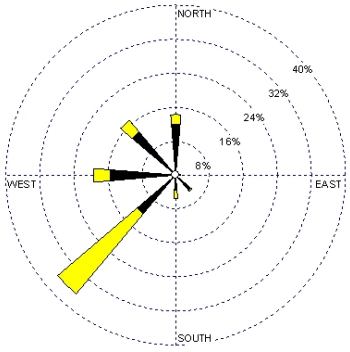
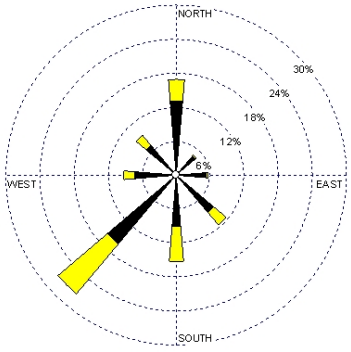
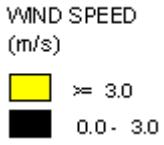
| All Seasons | Summer (December – February) |
|---|---|
|  <br>Average Wind Speed: 3.37 m/s<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% |  <br>Average Wind Speed: 4.39 m/s<br>Axis Frequencies: 7%, 14%, 21%, 28%, 35% |
| **Autumn (March – May)** | **Winter (June – August)** |
|  <br>Average Wind Speed: 2.94 m/s<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% |  <br>Average Wind Speed: 2.67 m/s<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% |
| **Spring (September – November)** | **Legend** |
|  <br>Average Wind Speed: 3.50 m/s<br>Axis Frequencies: 9%, 18%, 27%, 36%, 45% |  |

Figure 5-3: Wind Rose Plots of Night Time Period for the Referenced Meteorological Station - Bureau of Meteorology – The Horsley Park (2005-2009)

| All Seasons | Summer (December – February) |
|---|---|
|  <br>Average Wind Speed: 2.28 m/s<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |  <br>Average Wind Speed: 2.20 m/s<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |
| **Autumn (March – May)** | **Winter (June – August)** |
|  <br>Average Wind Speed: 2.21 m/s<br>Axis Frequencies: 6%, 12%, 18%, 24%, 30% |  <br>Average Wind Speed: 2.45 m/s<br>Axis Frequencies: 8%, 16%, 24%, 32%, 40% |
| **Spring (September – November)** | **Legend** |
|  <br>Average Wind Speed: 2.25 m/s<br>Axis Frequencies: 5%, 10%, 15%, 20%, 25% |  |

As shown in the wind rose plots, there is no season where the wind speed is less than 3 m/s from any of the four directions for more than 30% of the time. Accordingly, light winds are not considered in this assessment.

Figure 5-4: Location of Nearest Residential Receivers


Source: © *NearMap*

The noise impact of the proposed addition of concrete Batching Plant was modelled under the following meteorological conditions:

- Condition A: Neutral weather conditions;
- Condition B: 3 m/s; and
- Condition C: 2 m/s and an F Class temperature inversion.

Table 5-9: Noise Modelling Results - Condition A

| Receptor | Predicted Noise Levels | | | | Criteria | | | |
|---|---|---|---|---|---|---|---|---|
| | Day ($L_{Aeq}$) | Evening ($L_{Aeq}$) | Night ($L_{Aeq}$) | Night ($L_{Amax}$) | Day ($L_{Aeq}$) | Evening ($L_{Aeq}$) | Night ($L_{Aeq}$) | Night ($L_{Amax}$) |
| R2 | 44.1 | 27.0 | 27.0 | 22.2 | 4954 | 45 | 38 | 56 |
| R3 | 29.5 | 8.0 | 8.0 | 1.6 | 54 | 45 | 38 | 56 |
| R4 | 28.5 | 6.8 | 6.8 | 0.4 | 54 | 45 | 38 | 56 |
| R7 | 35.0 | 19.0 | 19.0 | 14.1 | 54 | 45 | 38 | 56 |

Table 5-10: Noise Modelling Results - Condition B

| Receptor | Predicted Noise Levels | | | | Criteria | | | |
|---|---|---|---|---|---|---|---|---|
| | Day ($L_{Aeq}$) | Evening ($L_{Aeq}$) | Night ($L_{Aeq}$) | Night ($L_{Amax}$) | Day ($L_{Aeq}$) | Evening ($L_{Aeq}$) | Night ($L_{Aeq}$) | Night ($L_{Amax}$) |
| R2 | 46.2 | 31.5 | 31.6 | 27.0 | 54 | 45 | 38 | 56 |
| R3 | 31.5 | 12.0 | 12.0 | 6.3 | 54 | 45 | 38 | 56 |
| R4 | 30.4 | 10.8 | 10.8 | 5.0 | 54 | 45 | 38 | 56 |
| R7 | 38.5 | 24.0 | 24.0 | 19.3 | 54 | 45 | 38 | 56 |

Table 5-11: Noise Modelling Results - Condition C

| Receptor | Predicted Noise Levels | | | | Criteria | | | |
|---|---|---|---|---|---|---|---|---|
| | Day ($L_{Aeq}$) | Evening ($L_{Aeq}$) | Night ($L_{Aeq}$) | Night ($L_{Amax}$) | Day ($L_{Aeq}$) | Evening ($L_{Aeq}$) | Night ($L_{Aeq}$) | Night ($L_{Amax}$) |
| R2 | 46.2 | 31.5 | 31.6 | 27.0 | 54 | 45 | 38 | 56 |
| R3 | 31.5 | 12.0 | 12.0 | 6.3 | 54 | 45 | 38 | 56 |
| R4 | 30.4 | 10.8 | 10.8 | 5.0 | 54 | 45 | 38 | 56 |
| R7 | 38.5 | 24.0 | 24.0 | 19.3 | 54 | 45 | 38 | 56 |

The contour maps for Conditions A, B and C follows. The significant reduction in noise levels for R3 and R4 is due to significant topographical differences not separation distances.

Figure 5-5: Noise Contour Modelling – Day Condition Neutral

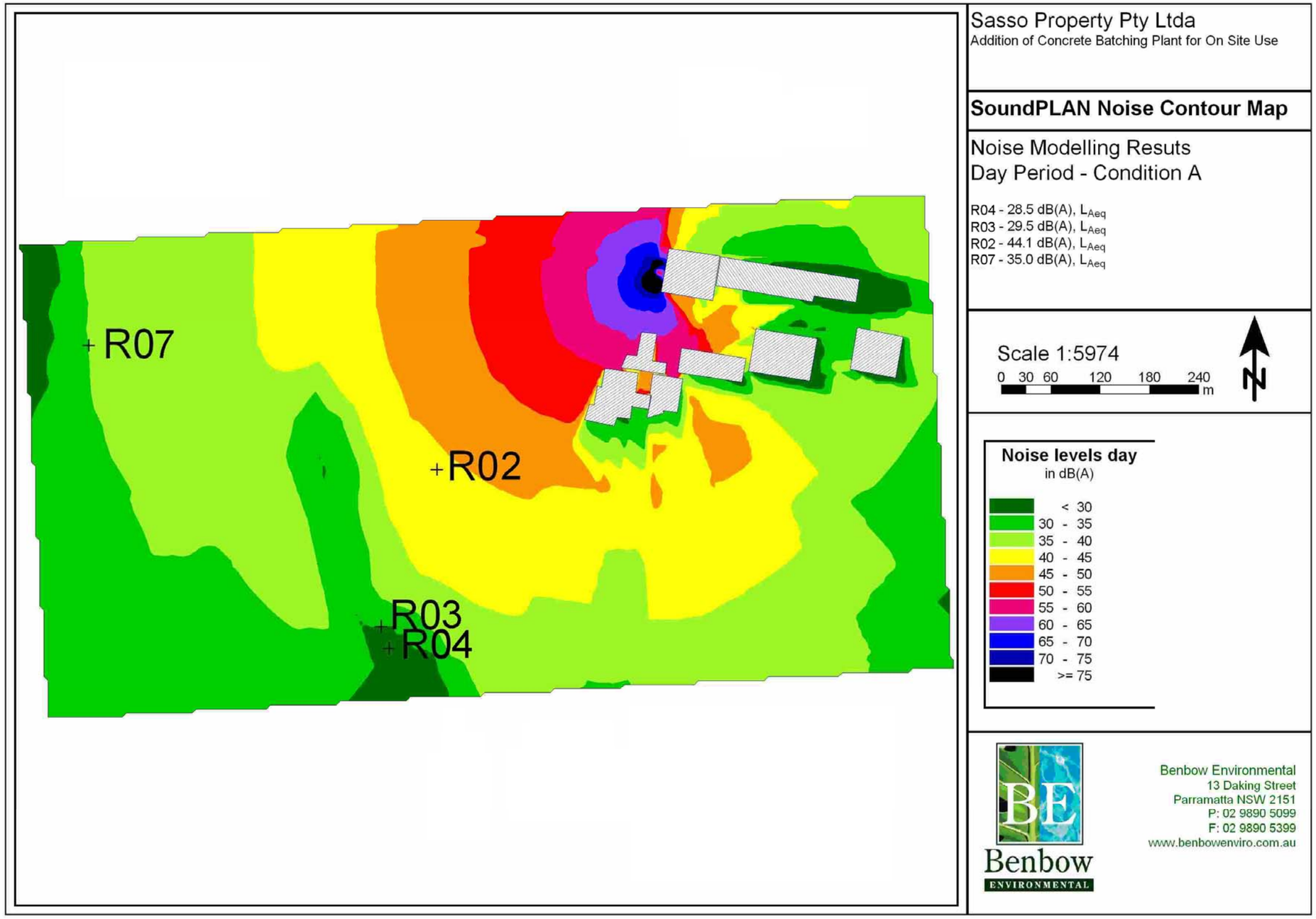


Figure 5-6: Noise Contour Modelling - Evening Period Neutral

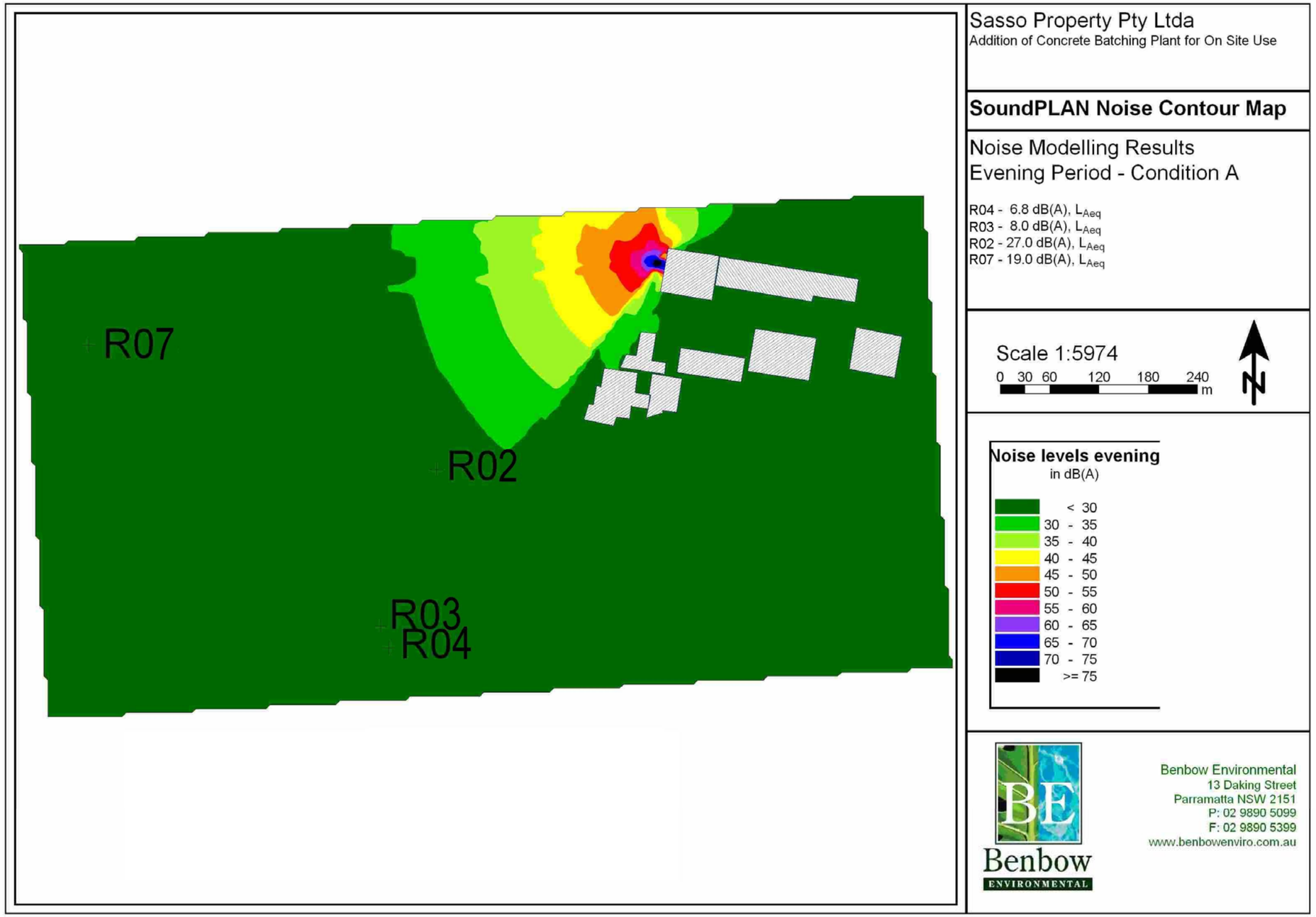


Figure 5-7: Noise Contour Modelling - Night Max Neutral

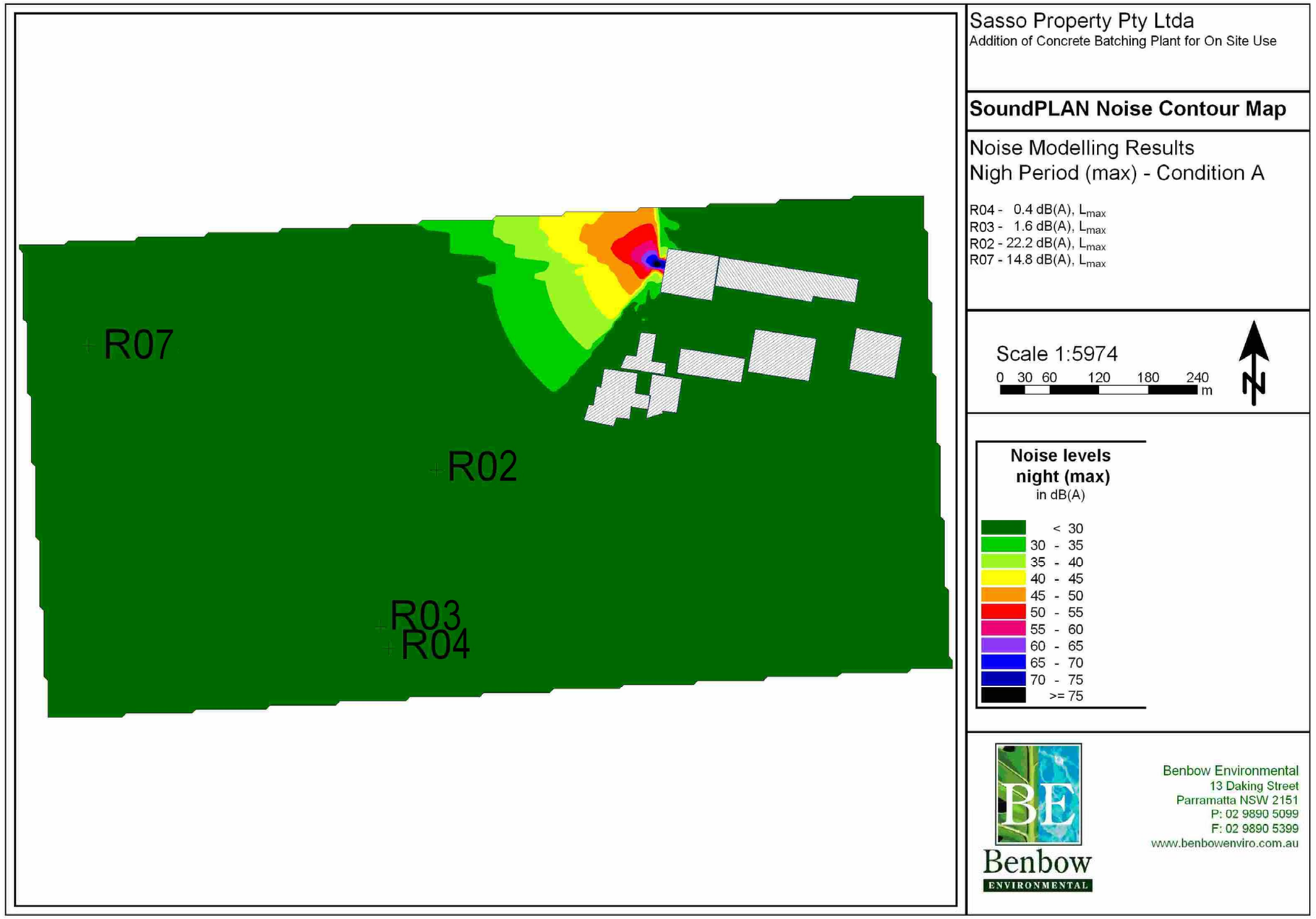
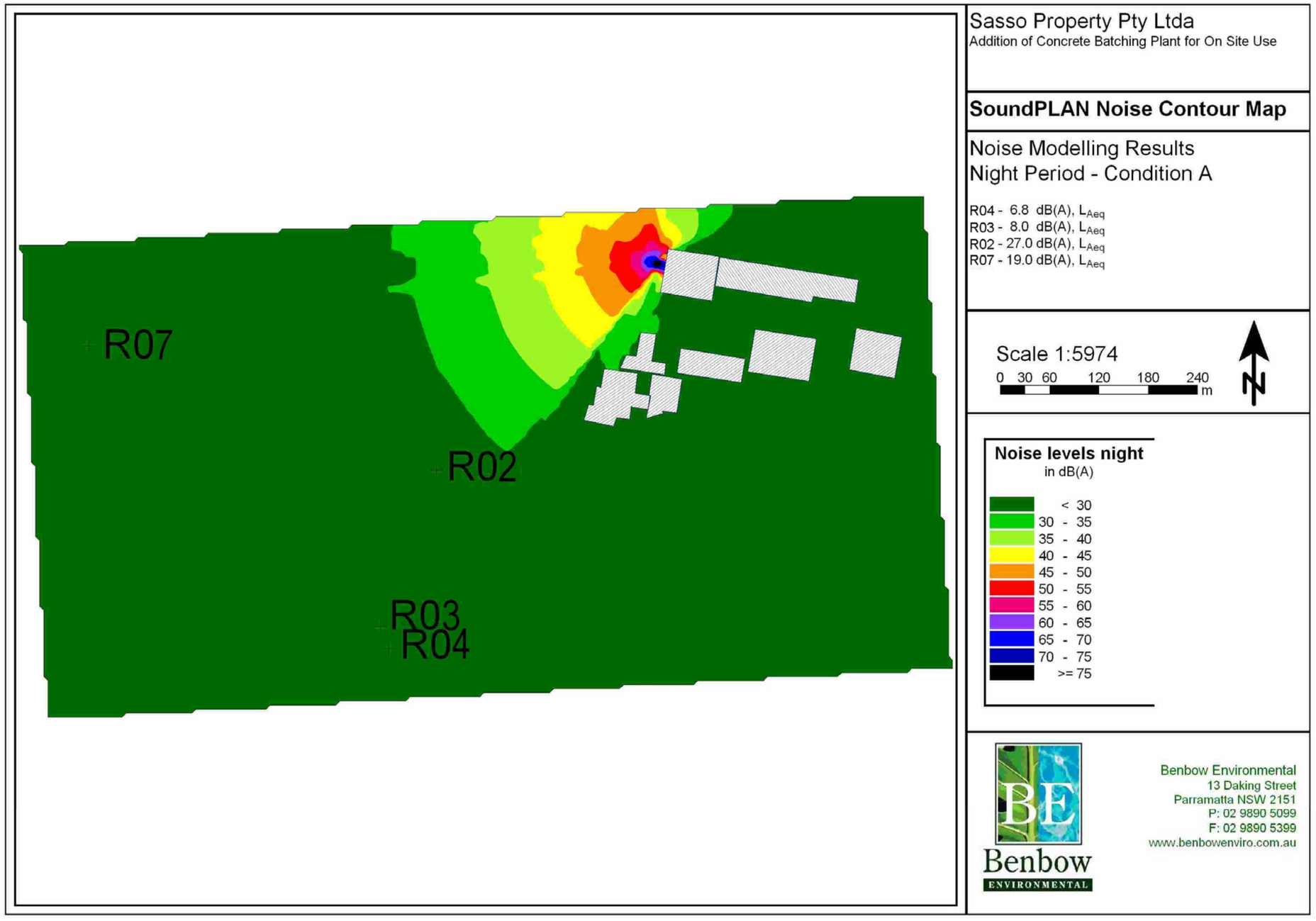


Figure 5-8: Noise Contour Modelling - Night Neutral



### 5.1.4 Construction Noise

The noise generated by machinery used for construction and demolition of eastern bay of the existing Warehouse were referenced to Appendix D of Australian Standard AS 2436-1981: "*Guide to noise control on construction, maintenance and demolition sites"* and data collected by Benbow Environmental on previous jobs or held in our data library.

Typical construction equipment and plant used on construction sites are presented in Table 5-12.

Table 5-12: Typical Construction Equipment & Noise Levels, dB(A)

| Item | Description | Sound Power Levels |
|---|---|---|
| 1 | Bulldozer | 108-118 |
| 2 | Concrete Leveller | 110-115 |
| 3 | Mobile Crane | 110-115 |
| 4 | Machine Mounted Hydraulic Drill | 110-115 |
| 5 | Pneumatic Hand Tools (general) | 110-115 |
| 6 | Tracked Excavator | 105-115 |
| 7 | Dump Trucks | 102-112 |
| 8 | Concrete Truck | 108-113 |
| 9 | Concrete Pump | 100-110 |
| 10 | Water Cart | 106-108 |
| 11 | Truck (>20 tonne) | 103-108 |
| 12 | Asphalt Truck | 105-110 |
| 13 | Power Generator | 100-106 |
| 14 | Concrete Vibrator | 101-105 |

Construction activities for the proposed development would include minor breaking up of existing pavement, excavation of the pit and the piers, pouring of concrete and erection of the plant.

To assess the noise emission levels from construction activities the following equipment were used in the noise modelling:

- Concrete Leveller,
- Tracked Excavator,
- Concrete Truck,
- Truck, and
- Power Generator

The construction noise activities will be <60 dB(A) and are able to comply with the Interim Construction Noise Criteria.

- R2 59 dB(A)
- R3 56 dB(A)
- R4 55 dB(A)
- R7 54 dB(A)

### 5.1.5 Conclusion

Noise compliance is achieved at all residential locations. The inherent noise control incorporated into the design of the proposed development mitigates all noise emissions from the proposed activities of the development. No additional noise controls are required.

## 5.2 AIR QUALITY

### 5.2.1 Introduction

This section presents the air quality impact assessment of the proposed development. This study aims to identify all potential air emission sources on site, quantifies the associated impacts by utilising an air dispersion modelling program, and assesses the impacts and outcomes by comparing them with relevant legislation, standards and guidelines.

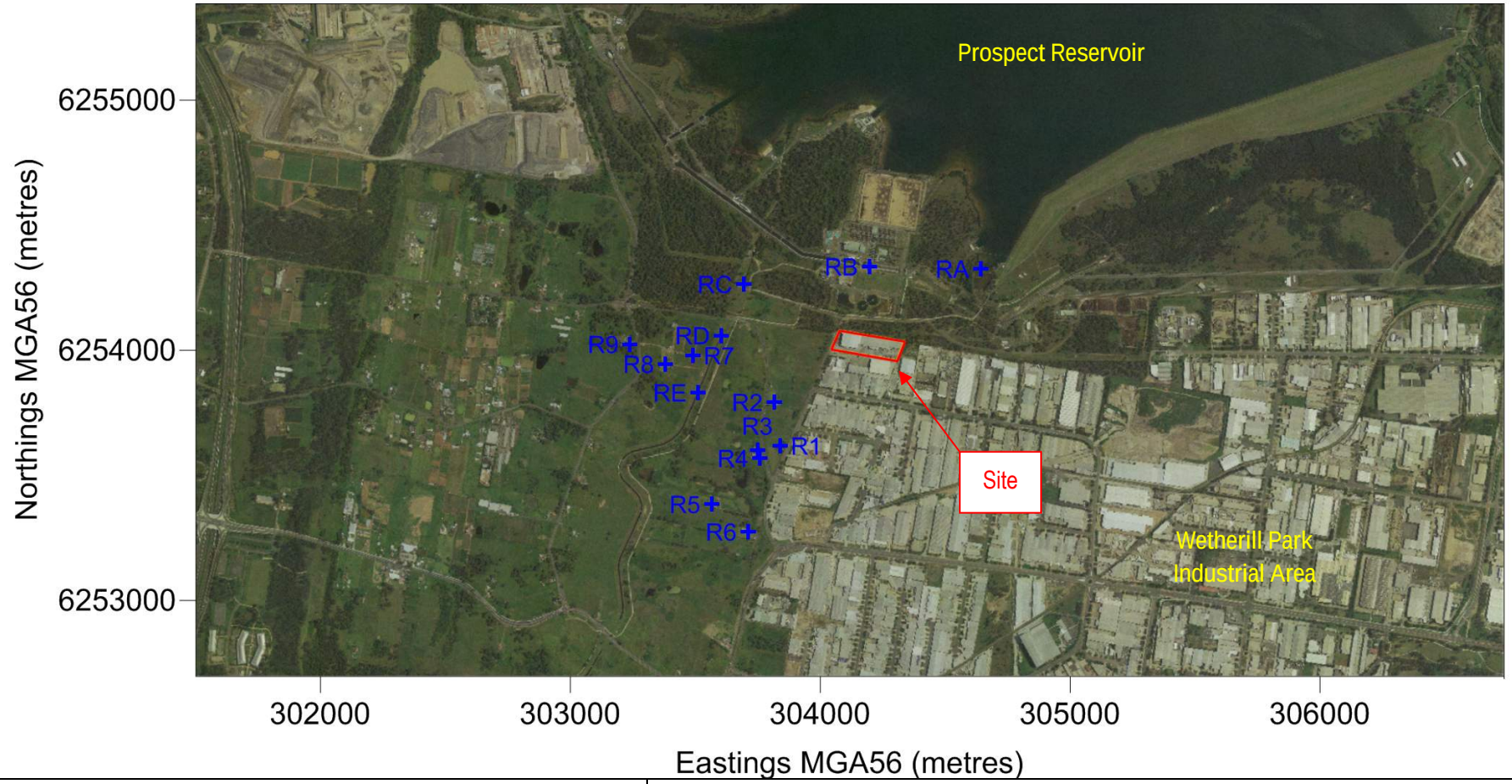
### 5.2.2 Sensitive Receivers

The nearest residential receivers discussed in Section 4.2.3 are a subset of what has been identified as the nearest identified receivers for air impacts. The list of air impacts receivers are provided in Table 5-13. Figure 5-9 shows the locations of these receivers in an aerial photograph.

Table 5-13: Nearest Potentially Affected Receivers Considered

| Receivers | Identification | Approximate Distance to Site Boundary (m) | Bearing |
|---|---|---|---|
| R1 | 28 Trivet Street | 432 | South-West |
| R2 | 38-50 Trivet Street | 314 | South-West |
| R3 | 15-23 Trivet Street | 491 | South-West |
| R4 | 5-13 Trivet Street | 513 | South-West |
| R5 | 132-142 Cowpasture Road | 773 | South-West |
| R6 | 144-154 Cowpasture Road | 795 | South-West |
| R7 | 144-170 Ferrers Road, Lot 39 DP 13961 | 558 | West |
| R8 | 144-170 Ferrers Road, Lot 38A DP 13961 | 672 | West |
| R9 | 127-131 Ferrers Road | 803 | West |
| RA | Prospect Reservoir | 428 | North-East |
| RB | Sydney Water Supply | 275 | North |
| RC | Sydney Water Supply Canal | 425 | North-West |
| RD | Sydney Water Supply Canal | 432 | West |
| RE | Sydney Water Supply Canal | 543 | South-West |

Figure 5-9: Location of Nearest Receivers




Legend:
- Site Boundary
- Nearest Residential Receivers

Source: Department of Lands © 2008, SIX Portal
Link: www.lands.nsw.gov.au

### 5.2.3 Meteorology

#### 5.2.3.1 Site Representative Meteorological Data

The closest meteorological monitoring station located within proximity to the subject site is the Horsley Park Equestrian Centre Automatic Weather Station (AWS), which is located approximately 3 km south-west of the site. Meteorological data from this station has been analysed as follows:

Table 5-14 provides a summary of yearly meteorological data that has been analysed to determine the most appropriate year to reference.

Table 5-14: Summary of Meteorological Data Completeness from Horsley Park AWS

| Year | Temperature | Wind Speed | Wind Direction |
|---|---|---|---|
| 2005 | 90.0% | 96.6% | 96.6% |
| 2006 | 95.6% | 99.9% | 99.9% |
| 2007 | 99.8% | 100.0% | 100.0% |
| 2008 | 93.4% | 98.6% | 98.6% |
| 2009 | 96.6% | 99.6% | 99.6% |

Meteorological data from the years 2007 and 2009 are considered to be the most appropriate data to reference for the assessment given the indicated completeness values. Since the 2009 dataset contains the most current data available, the 2009 dataset was then selected as the site-representative meteorological data.

The following sections provide details on the 2009 Horsley Park Meteorological Data.

#### 5.2.3.2 Atmospheric Stability

The "stability" of the atmosphere is a classification used to describe the structure of the atmosphere in terms of temperature, specifically, how temperature changes in the atmosphere with altitude. Classification is often done according to the Pasquill-Gifford classification system that consists of six stability class groups, shown in Table 5-15. The class "A" describes an atmosphere where the air is well-mixed and there is little hindrance of dispersion into the atmosphere. At the other end of the scale is class "F", which describes conditions under which temperature inversions would occur, where winds are calm or absent and air close to the earth's surface cannot rise into the atmosphere due to the presence of warmer air layers above. The classes in between A and F indicate changing degrees of stability due to variations in temperature in the atmosphere.

| Table 5-15: Pasquill-Gifford Stability Class System | |
|---|---|
| Stability Class | Description |
| A | Extremely Unstable |
| B | Unstable |
| C | Slightly Unstable |
| D | Neutral |
| E | Slightly Stable |
| F | Very Stable |

Worst case dispersion conditions from the site would be best associated with F-class stability conditions – generally associated with still / light winds and clear skies during the night time or early morning period (stable conditions). Analysis of the referenced site-representative meteorological data indicates that the F-class dispersion conditions were present for approximately 6.8% of the time at Horsley Park.

However, it can be seen that stability class frequencies in the meteorological file have not been biased towards giving enhanced dispersive conditions. Stability class D has been determined to be the most frequent, with an occurrence of 56.7%. D-class stability conditions provide neutral conditions and can occasionally procure some enhancement of air emission impacts but at a slightly less amount compared to F-class stability conditions. Hence, a sufficient amount of risk in enhanced impacts is present in the site-representative meteorological dataset and has been considered as part of the assessment.

Stability classes A, B, C, which offers the best dispersion condition, occurred with frequencies of 5%, 6.2% and 13.8% respectively.

Table 5-16: Wind Direction / Stability Class Frequency Distribution (Count) for Referenced Meteorological Data Input File – Bishops Bridge 2007 (by TAPM)

| Frequency Distribution (Count) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Direction (Blowing From) | Stability Class | | | | | | |
| | A | B | C | D | E | F | Total |
| N | 80 | 112 | 158 | 683 | 97 | 180 | 1,310 |
| NE | 85 | 97 | 116 | 219 | 52 | 40 | 609 |
| E | 50 | 56 | 174 | 421 | 64 | 41 | 806 |
| SE | 28 | 77 | 236 | 845 | 111 | 77 | 1,374 |
| S | 24 | 32 | 97 | 577 | 103 | 54 | 887 |
| SW | 44 | 33 | 90 | 866 | 366 | 48 | 1,447 |
| W | 53 | 58 | 160 | 501 | 61 | 77 | 910 |
| NW | 60 | 59 | 129 | 672 | 104 | 57 | 1,,081 |
| Total | 424 | 524 | 1,160 | 4,784 | 958 | 574 | 8,424 |

Table 5-17: Wind Direction / Stability Class Frequency Distribution (Percentage) for Referenced Meteorological Data Input File – Bishops Bridge 2007 (by TAPM)

| Frequency Distribution (Percentage %) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Direction (Blowing From) | Stability Class | | | | | | |
| | A | B | C | D | E | F | Total |
| N | 0.95 | 1.33 | 1.88 | 8.11 | 1.15 | 2.14 | 15.55 |
| NE | 1.01 | 1.15 | 1.38 | 2.60 | 0.62 | 0.47 | 7.23 |
| E | 0.59 | 0.66 | 2.07 | 5.00 | 0.76 | 0.49 | 9.57 |
| SE | 0.33 | 0.91 | 2.80 | 10.03 | 1.32 | 0.91 | 16.31 |
| S | 0.28 | 0.38 | 1.15 | 6.85 | 1.22 | 0.64 | 10.53 |
| SW | 0.52 | 0.39 | 1.07 | 10.28 | 4.34 | 0.57 | 17.18 |
| W | 0.63 | 0.69 | 1.90 | 5.95 | 0.72 | 0.91 | 10.80 |
| NW | 0.71 | 0.70 | 1.53 | 7.98 | 1.23 | 0.68 | 12.83 |
| Total | 5.03 | 6.22 | 13.77 | 56.79 | 11.37 | 6.81 | 100.00 |

#### 5.2.3.3 Wind Rose Plots

Wind rose plots show the direction from which the wind is coming with triangles known as "petals". The petals of the plots in the figure summarise wind direction data into 8 compass directions that is north, north-east, east, south-east, south, south-west, west and north-west.

The length of the triangles, or "petals", indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class.

The proportion of time for which wind speed is less than the speed in the first class (0.5 m/s), or when speed is negligible, is referred to as calm hours or "calms". Calms are not shown on a wind rose as they have no direction, but the proportion of time that they make up for the period under consideration is noted under each wind rose.

The concentric circles in each wind rose are the axes that denote wind frequencies. In comparing the plots it should be noted that the axis varies between wind roses, although all wind roses are the same size. The frequencies shown in the first quadrant (top-right quarter) of each wind rose are stated beneath the wind rose.

Figure 5-10 and Figure 5-11 provides the wind rose plots for Horsley Park AWS and corresponds to the referenced yearly (2009) data and the long term (2005-2009) data available at the referenced monitoring station.

It can be seen that the wind dominance and intensities provided in the 2009 meteorological data and the long term data are similar if not close to being equivalent.

Throughout the course of a year, it is shown that southwest winds dominate at frequencies close to 17% (2009 data) and 20% (long term data). The 2009 data shows increased frequency of winds from the southeast close to 16% whilst the long term data reports a frequency of 14% for this direction.

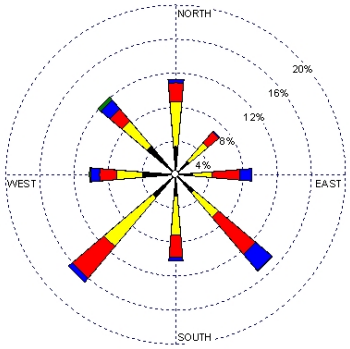
In summer, winds from the southeast dominate at a frequency of 24% in 2009 whilst the long term data shows dominance from this direction at a frequency of 22%. During autumn, winds from the southwest dominate at a frequency of 24% whilst the long term data shows an average frequency of 26% for this wind direction. In winter, the long term data shows the continued dominance of southwest winds at a frequency of 26% whilst the 2009 data shows dominance of northwest winds at a frequency of 23%. Winter winds in 2009 were only dominant for approximately 19%. In spring, the 2009 data shows dominance of winds from the southeast (16%) with other wind directions having frequencies close to this figure. The long term data also exhibits a similar pattern, except that south-west winds remain to dominate at a frequency of 16% whereas southeast winds only dominate at a frequency of 14%.

Changes and shifts in wind patterns are observed as shown in the comparison, which may be due to climate change.

This further validates that the most current and most complete meteorological data would be the most suitable meteorological data to use for the assessment, as it represents these observed changes and shifts in wind patterns which can sometimes play an essential role in determining any potential risks in off-site impacts.

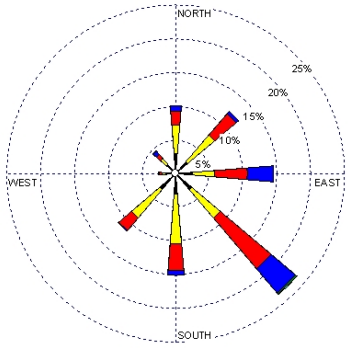
Figure 5-10: Wind Rose Plots for the Referenced Meteorological Station - Bureau of Meteorology The Horsley Park Equestrian Centre (2009)

**All Seasons**



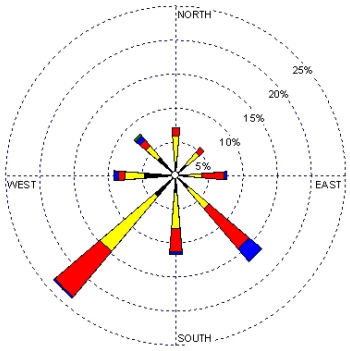

Average Wind Speed: 3.01 m/s
Calms Frequency: 9.01 %
Axis Frequencies: 4%, 8%, 12%, 16%, 20%

**Summer (December – February)**



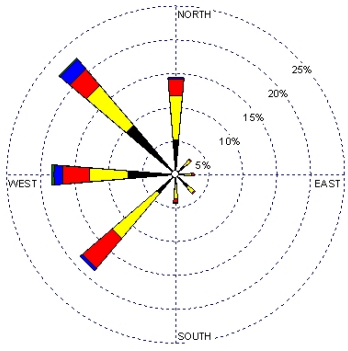

Average Wind Speed: 3.36 m/s
Calms Frequency: 6.25 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

**Autumn (March – May)**



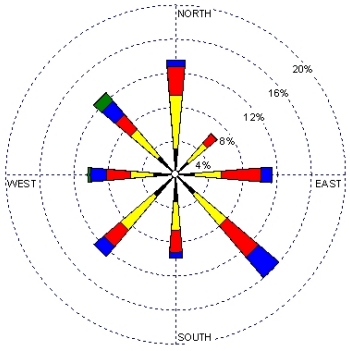

Average Wind Speed: 2.88 m/s
Calms Frequency: 10.64 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

**Winter (June – August)**



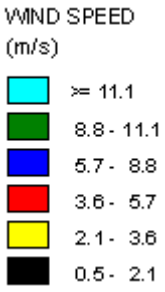

Average Wind Speed: 2.50 m/s
Calms Frequency: 11.91 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

**Spring (September – November)**




Average Wind Speed: 3.32 m/s
Calms Frequency: 7.12 %
Axis Frequencies: 4%, 8%, 12%, 16%, 20%

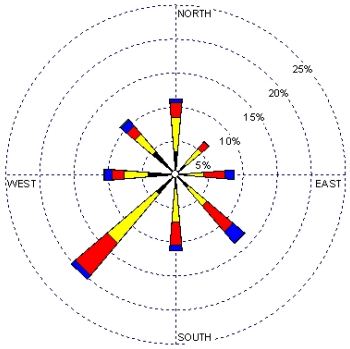
**Legend**




Note: Calms are defined as wind events that occur at a wind speed of equal to or less than 0.5 m/s.

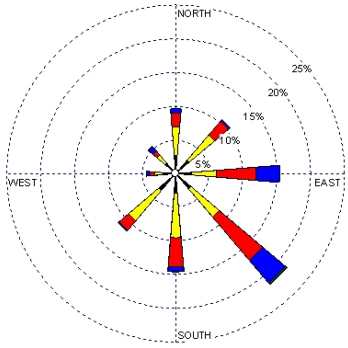
Figure 5-11: Wind Rose Plots for the Referenced Meteorological Station - Bureau of Meteorology The Horsley Park Equestrian Centre (2005-2009)

**All Seasons**



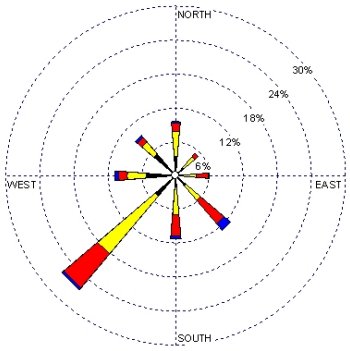

Average Wind Speed: 3.06 m/s
Calms Frequency: 7.52 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

**Summer (December – February)**



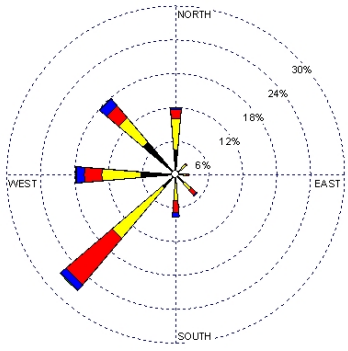

Average Wind Speed: 3.27 m/s
Calms Frequency: 7.29 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

**Autumn (March – May)**



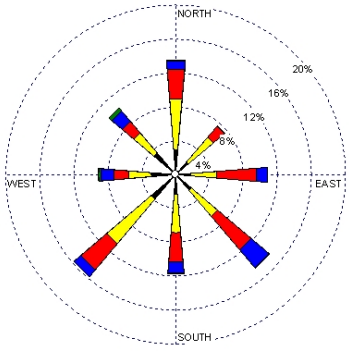

Average Wind Speed: 2.79 m/s
Calms Frequency: 8.58 %
Axis Frequencies: 6%, 12%, 18%, 24%, 30%

**Winter (June – August)**



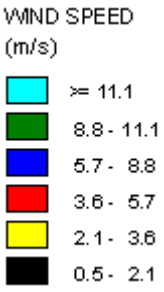

Average Wind Speed: 2.88 m/s
Calms Frequency: 7.54 %
Axis Frequencies: 6%, 12%, 18%, 24%, 30%

**Spring (September – November)**




Average Wind Speed: 3.31 m/s
Calms Frequency: 6.64 %
Axis Frequencies: 4%, 8%, 12%, 16%, 20%

**Legend**




Note: Calms are defined as wind events that occur at a wind speed of equal to or less than 0.5 m/s.

### 5.2.3.4 Background Air Quality

The most appropriate background air quality data to reference for use in this assessment is the $PM_{10}$ data provided in the Air Quality Monitoring Reports published by the Department of Environment, Climate Change and Water (DECCW 2007). The nearest identified background air quality monitoring station is the Prospect (William Lawson Park) monitoring station, which is located approximately 5.2 km north-east of the subject site. The next closest monitoring station is located approximately 15 km northwest of the subject site, which makes the Prospect data more suitable and much more site-representative for reference. Table 4-2 below provides the observed data from the Prospect Monitoring station.

Table 5-18: Background Air Quality Concentration Data from Prospect Monitoring Station (Q1-Q4 2007)

| Month | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Av. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $PM_{10}$ | Av. All Hours | - | - | 18 | 21 | 21 | 14 | 14 | 15 | 18 | 26 | 16 | 17 | 18 |
| | 1-Hour Maxima | - | - | 29 | 42 | 45 | 26 | 26 | 30 | 34 | 47 | 34 | 27 | 34 |

Given the data above, the most appropriate background air quality values for use in this assessment are as follows:

- 24 hour $PM_{10}$ background air quality concentration average: 34.0 µg/m$^3$
- Annual $PM_{10}$ background air quality concentration average: 18.0 µg/m$^3$

In the absence of the availability of Total Suspended Particulates (TSP) background air quality data, calculations using the $PM_{10}$ background data were used to determine the background air concentration of TSP. Using the particle size distribution (PSD) for mechanically generated aggregate and unprocessed ores, obtained from AP-42, it was determined that the equivalent background air quality for TSP using the annual $PM_{10}$ data above is 35.3 µg/m$^3$. The background air quality for TSP shall be incorporated into the modelling to conservatively predict the cumulative ground level impact of air pollutants to the nearest receivers.

Dust deposition background data were also found to be unavailable. Therefore, a conservative value of 2 g/m$^2$/month was used to predict the cumulative ground level impact.

### 5.2.4 Terrain

Figure 5-12 and Figure 5-13 provides three-dimensional views of the topography of the site location. The terrain of the regional site location is found to be irregular and undulating, which is highlighted by the exaggeration of terrain height in Figure 5-12. However, it is anticipated that these changes in terrain elevation will have minimal effect in terms of enhancement of impacts of the proposed development's emissions.

Figure 5-12: Three-Dimensional View of the Terrain of Site Location (Z-Axis Exaggerated by a Factor of 6)

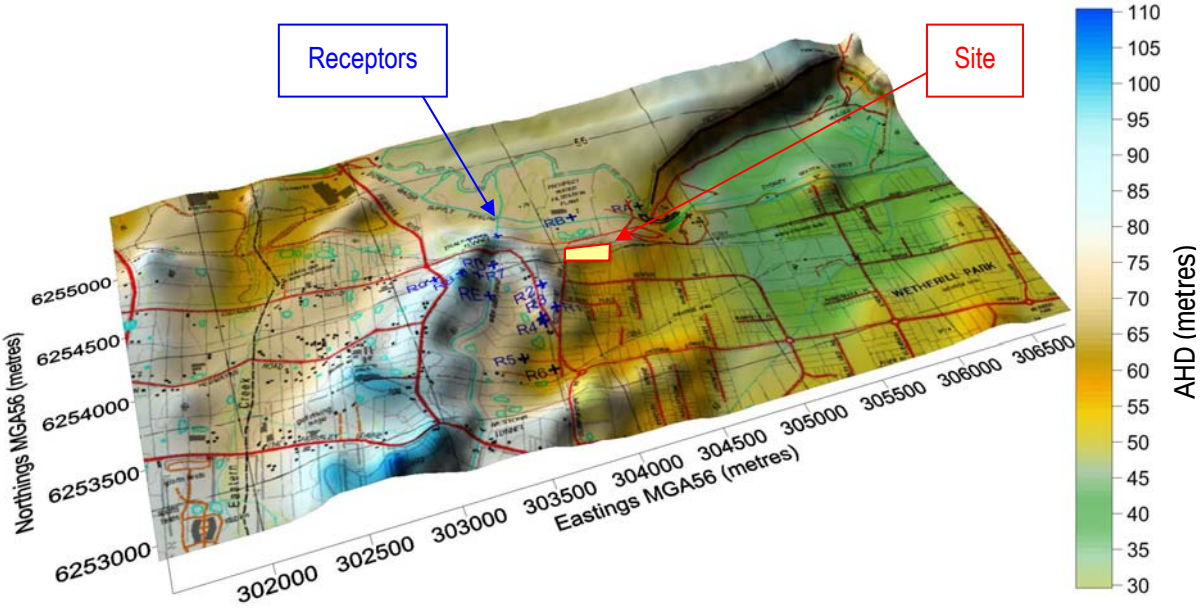
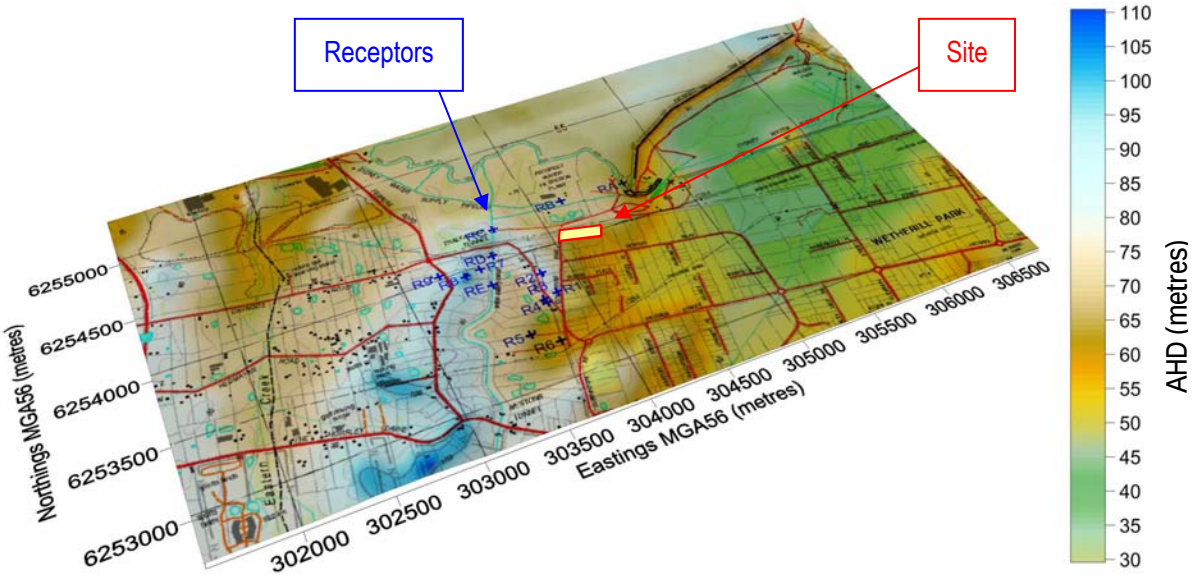



Figure 5-13: Three-Dimensional View of the Terrain of Site Location (Z-Axis Unexaggerated)



### 5.2.5 Air Quality Criteria and Guidelines

#### 5.2.5.1 Protection of Environment Operations Act 1997 (POEO Act)

The Protection of the Environment Operations Act 1997 (POEO Act) applies the following definitions relating to air pollution.

*"Air pollution" means the emission into the air of any air impurity.*

*While "air impurity" includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances.*

The following clauses of this Act have most relevance to the site.

- Clause 124 (Operation of Plant)

  *The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure:*
  *a) to maintain the plant in an efficient condition, or*
  *b) to operate the plant in a proper and efficient manner.*

  *Where premises is defined within the POEO Act as including: (a) a building or structure, or (b) land or a place (whether enclosed or built or not), or a mobile plant, vehicle, vessel or aircraft.*

- Clause 126 (Dealing with Materials)

  *(1) The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupiers failure to deal with those materials in a proper and efficient manner.*
  *(2) In this section:*
  *a) deal with materials means process, handle, move, store or dispose of the materials.*
  *b) materials include raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.*

- Clause 127 Proof of causing pollution

  *To prove that air pollution was caused from premises within the meaning of Sections 124 – 126, it is sufficient to prove that air pollution was caused on the premises, unless the defendant satisfies the court that the air pollution did not cause air pollution outside the premises.*

- Clause 128 Standards of air impurities not to be exceeded

*(1) The occupier of any premises must not carry on any activity, or operate any plant, in or on the premises in such a manner as to cause or permit the emission at any point specified in or determined in accordance with the regulations of air impurities in excess of:*
   *a) The standard of concentration and the rate, or*
   *b) The standard of concentration or the rate.*
   *c) Prescribed by the regulations in respect of any such activity or any such plant.*

*(2) Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.*

The subject site would be required to adhere to the above listed legislative requirements.

#### 5.2.5.2 Department of Environment and Climate Change NSW Guidelines

The Department of Environment, Climate Change and Water (DECCW) guideline, the "Approved Methods for the Modelling and Assessment of Air Pollutants (AMMAAP) in New South Wales (DECCW 2005) was used for this assessment. The DECCW AMMAAP aims to provide a list of statutory methods for the modelling and assessment of air pollutants from stationary sources in NSW and is referred to by the Protection of Environment Operations (Clean Air) Regulation 2002.

The ground level concentration criteria have been referenced from the DECCW AMMAAP. Pollutants were identified to be particulate matter and are shown in Table 5-19 along with the averaging periods to be assessed in the dispersion modelling. The impact assessment criteria shown are based on the pollutants that could be emitted from the air emission sources on site.

Table 5-19: Impact Assessment Criteria for $PM_{10}$, TSP and Deposited Dust

| Substances | Averaging Period | Impact Assessment Criteria |
|---|---|---|
| Fine Particulates ($PM_{10}$) | 24 hours<br>Annual | 50 $\mu g/m^3$<br>30 $\mu g/m^3$ |
| Total Suspended Particulates (TSP) | Annual | 90 $\mu g/m^3$ |
| Deposited Dust | Annual | 2 $g/m^2$/month [a]<br>4 $g/m^2$/month [b] |

Source: DECCW NSW (August 2005)
Notes: [a] Criteria for the maximum increase in deposited dust level.
[b] Criteria for the maximum total deposited dust level.

Under the DECCW Approved Methods guidelines, all assessable pollutants are to be assessed with no exceedances to the limits stipulated above be exceeded at any of the nearest identified receivers at any time.

#### 5.2.5.3 Protection of the Environment Operations (Clean Air) Regulation 2010

The NSW Protection of the Environment and Operations (Clean Air) Regulation 2010 (NSW Govt 2010) provides limits for exit point of stack sources, and is only applicable to these sources in NSW for both scheduled and non-scheduled premises. The relevant limit is listed in Table 5-20, which is a limit that is classified under Group 6 of the scheduled premises grouping activities in the regulation.

Table 5-20: Protection of Environment and Operations (Clean Air) Regulation Limits

| Pollutant | Activity or Plant | Regulation Emission Concentration Limit at Stack ($mg/m^3$ at stack reference conditions) | Averaging Period |
|---|---|---|---|
| Solid particles (Total) | Any activity or plant (except as listed below) | 50 $mg/m^3$ | 1-hour |
| | Any crushing, grinding, separating or materials handling activity | 20 $mg/m^3$ | 1-hour |

Note: The referenced limits are for Group 6 of the group classification.

The POEO Clean Air Regulation Solid Particles (or TSP) limit is applicable to any stacks on the proposed development, which includes any form of dust collector stacks and the silo vents.

#### 5.2.5.4 National Environment Protection Measure

The following documents relate to the ambient air quality standards and goals of the National Environment Protection Measure established by the National Environment Protection Council (NEPC):

- Review of the National Environment Protection (Ambient Air Quality) Measure – Discussion Paper;
- National Environment Protection (Ambient Air Quality) Measure; and
- National Environment Protection (Air Toxics) Measure.

The current NEPC goals for particles as $PM_{10}$ of a maximum ambient air quality concentration of 50 $ug/m^3$ on a 24-hour averaging period basis has been used to determine whether the proposed development can remain to achieve these goals. This limit is similar to the $PM_{10}$ criteria stipulated in the DECCW modelling guidelines.

### 5.2.6 Air Emission Sources

#### 5.2.6.1 Construction

It is anticipated that emissions associated with the construction activities of the site would be minimal, given that areas to be excavated would only be a small portion (approximately 9%) of the site's total area.

In addition, the only areas where deep excavation works would be conducted are at the proposed underground hopper location, with an excavation depth of up to 6.6 m.

#### 5.2.6.2 Operational

The following list shows the potential air emission sources (and their corresponding ID) that have been identified from examining the proposed site operations and activities:

- Sand and Aggregate Raw Material Dumping (RMD);
- Use of Bin Elevators to Deliver Sand and Aggregate Raw Materials (SAT);
- Use of Conveyor Belts (CB);
- Aggregate and Sand Storage (AS);
- Weigh Hopper Loading (WHL);
- Mixing Line (ML); and
- Loading of Cement Stacks / Operation of Silo Dust Collector Vents (CL);

Dust and particulate emissions are the only assessable emissions applicable, given the nature of the proposed development.

No odour emission impacts are expected to occur, given that no green waste is being used as raw materials or being generated as part of the operations. Hence, it has not been deemed necessary to model odour impacts for the purpose of this assessment.

Given that most areas on site will be hardstand, with some areas being landscaped to an extent that it will be sealed so that the soil remains undisturbed, it is expected that there would be negligible wheel-generated dust emissions.

No stockpiles will be present on site, as these aggregate and sand raw materials will be kept in enclosed silos.

Most of the activities identified as air emission sources would be carried out within enclosures, except for the raw material dumping of sand and aggregates into the enclosed hopper, which automatically delivers materials into the respective silos.

Raw material dumping is carried out when trucks (entering the site for delivery) that carry sand and aggregate materials and dump these materials into an underground hopper, which is then connected to the bin elevators. The dumping activity involves dump trucks driving towards the underground bin and dumping the load at once into the underground hopper. The underground hopper itself would then be closed by a metal lid after each dump. No enclosures surround the underground hopper and the truck during the delivery, and so it is anticipated that the dust and particulate emissions from this are uncontrolled. This has been taken into account in the quantitative assessment.

Bin elevators, conveyor belts, sand and aggregate storage bins, weigh hoppers and the mixer line would be equipped with enclosures or are carried out indoors (i.e. inside the existing and proposed building structures). To be conservative and to avoid underestimation of impacts, the quantitative assessment has taken into account minor emissions from the activities carried out in these areas despite having these air emission controls.

### 5.2.7 Air Dispersion Modelling

#### 5.2.7.1 Predictive Model Utilised

AUSPLUME (Version 6.0), the Gaussian plume dispersion model, was used for the prediction of off-site impacts associated with all the air emissions on site. AUSPLUME is a steady-state plume model that is accepted by regulatory authorities in regards to air assessments where local topography does not adversely affect plume migration.

AUSPLUME uses consecutive meteorological data records to define the conditions for plume rise, transport, diffusion and deposition. The model was used to estimate the concentration and deposition value for each source for each hour of input meteorology and calculated user selected short-term or period average predictions. Atmospheric dispersion curves and surface roughness heights were selected, which specifically represented the conditions present.

The basis of the model used is the straight line, steady-state Gaussian Plume Equation (as consistent with current air dispersion theory). Stack source emissions have been adequately represented. The AUSPLUME modelling code is currently considered as the industry standard for predicting plume dispersions, with its use being accepted and recommended by DECCW, as outlined in the DECCW modelling guidelines.

#### 5.2.7.2 Air Emission Factors

Site-specific air emission factors were developed using relevant and appropriate methodologies from various references. These air emission factors were then used to create the site-specific emission rates to be used in the air dispersion modelling. Calculation methodologies and figures are provided as follows.

The site specific emission rates and reduction factors were derived from the document "Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing" published by the National Pollutant Inventory (NPI) (NPI EETM 1999) and the "Concrete Batch Plant Modelling Guide" published by the Iowa Department of Natural Resources (IDNR 2008).

The NPI document provides reduction factor for physical control, while the guide from Iowa's Department of Natural Resources provides the reduction factor for operational time of each activities.

Sand and Aggregate Raw Material Dumping (RMD)

Raw material dumping emissions were estimated using the emission factor for sand and aggregate transfer to elevated bin from the document "Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing" published by the National Pollutant Inventory (NPI) (NPI EETM 1999).

The referenced emission factor is 0.014 kg/tonne, which is an uncontrolled emission factor for $PM_{10}$. Emission rates for $PM_{10}$ were determined based on this factor whilst TSP emission rates were determined using the referenced $PM_{10}$ factor and the particle size distribution data provided in Attachment 8.

It is estimated that for each hour (out of 8 hours daily), 4 truck loads of raw materials would be dumped into the underground hopper. This means that each truck would load for a duration of approximately 10 minutes per each hour.

Reduction factors of 0.1 and 10/60 were used in the calculation of the emission rate for this activity.

Sand and Aggregate Transfer of Raw Materials to Elevated Silos (BESA & CB1)

Emissions associated with the use of bin elevators to transfer sand and aggregate raw materials were estimated using the emission factor used for sand and aggregate transfer, which is 0.014 kg/tonne (uncontrolled) and the capacity of the bucket elevator. Similarly, emission rates for $PM_{10}$ were calculated based on this factor whilst TSP emission rates were estimated using the referenced $PM_{10}$ factor and the particle size distribution data provided in Attachment 8.

The emissions for sand and aggregate transfer are divided into 2 sources: Bucket Elevator (BESA) and Conveyor Belt (CB1). Both these sources have been included in the modelling.

A reduction factor of 0.1 was used in the calculation of emission rates for this activity.

Use of Conveyor Belts (CB2)

Emissions associated with the use of conveyor belts were estimated using the emission factor used for sand and aggregate transfer, which is 0.014 kg/tonne (uncontrolled) and the yearly consumption capacity. Similarly, emission rates for $PM_{10}$ were calculated based on this factor whilst TSP emission rates were estimated using the referenced $PM_{10}$ factor and the particle size distribution data provided in Attachment 8.

Reduction factors of 0.1 and 30/60 were used in the calculation of emission rates for this activity.

Aggregate and Sand Storage (AS1)

Aggregate and sand storage emissions were estimated using the emission factor for wind erosion from sand and aggregate storage piles from the document "Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing" published by NPI (NPI EETM 1999).

The referenced emission factor is 3.9 kg/ha/day, which is an uncontrolled emission factor for $PM_{10}$. However, given that the storage of aggregate and sand raw materials would be fully enclosed, a reduction factor of 0 is used. Hence, zero emission rates are derived for both $PM_{10}$ and TSP, and therefore emissions from this activity are excluded.

Weigh Hopper Loading (WHL)

Emissions associated with weigh hopper loading were estimated using the emission factor for weigh hopper loading from the document "Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing" published by NPI (NPI EETM 1999) and the "Concrete Batch Modelling Guide" published by the Iowa Department of Natural Resources (IDNR 2008).

The referenced emission factor is 0.01 kg/tonne, which is an uncontrolled emission factor for $PM_{10}$. Emission rates for $PM_{10}$ were calculated based on this factor whilst TSP emission rates were estimated using the referenced $PM_{10}$ factor and the particle size distribution data provided in Attachment 8.

Reduction factors of 0.1 and 30/60 were used in the calculation of emission rates for this activity.

Skip Hoist Loading Emissions (SH)

Emissions associated with the loading of material into skip hoist were estimated using the emission factor for sand and aggregate transfer from "Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing" published by NPI (NPI EETM 1999) and the "Concrete Batch Modelling Guide" published by the Iowa Department of Natural Resources (IDNR 2008).

The referenced emission factor is 0.014 kg/tonne, which is an uncontrolled emission factor for $PM_{10}$. Emission rates for $PM_{10}$ were calculated based on this factor whilst TSP emission rates were estimated using the referenced $PM_{10}$ factor and the particle size distribution data provided in Attachment 8.

Reduction factors of 0.1 and 30/60 were used in the calculation of emission rates for this activity.

Aggregate and Sand Storage (AS2)

Aggregate and sand storage emissions from the skip hoist were estimated using the emission factor for wind erosion from sand and aggregate storage piles from the document "Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing" published by NPI (NPI EETM 1999) and the typical size of skip hoist.

The referenced emission factor is 3.9 kg/ha/day, which is an uncontrolled emission factor for $PM_{10}$.

A reduction factor of 30/60 was used in the calculation of emission rates for this activity.

Loading of Cement Silos / Operation of Silo Dust Collector Vents (CL)

Emissions associated with the loading of cement silo the from cement tanker are estimated using the specifications of the dust collector to be installed at each of the cement silos. Specifications of the dust collector used have been provided in Attachment 9.

The specifications indicate that a residual dust concentration of 10 mg/m$^3$ is achieved by the dust collector. Converting the proposed production capacity of the site into volumetric value (m$^3$) and multiplied with 10 mg/m$^3$ to conservatively determine the amount of dust potentially generated by the dust collector. This annual value was then used to calculate the appropriate emission rate for the dust collector.

No further reduction factors were used, as the provided concentration value has already taken into account the reduction effect of the dust collector.

As the particle size distribution of cement is not readily available, emissions for both dust and $PM_{10}$ were assumed to be identical.

Mixing Line (ML)

Emissions associated with the loading and use of the mixing line has been estimated using the specifications of the dust collector – this is because dust collectors are attached to the exhausts of the dust emission hoods, which are proposed to be installed and used to capture any fugitive dust emissions from the process. The dust collector used for this activity is similar to what is used in the cement loading, and its specifications can be found in Attachment 9.

The residual dust concentration of 10 mg/m$^3$ has also been used in this case and similarly, the proposed production capacity in m$^3$/year is then multiplied with the concentration to conservatively determine the amount of dust emitted from the source. The annual value calculated was used to estimate the appropriate emission rate.

Similarly, no further reduction factors were used, as the value provided in the dust collector specifications have already accounted for the reduction effects from the dust collector.

As the particle size distribution of cement is not readily available, emissions for both dust and $PM_{10}$ were assumed to be identical.

#### 5.2.7.3 Air Emissions Inventory

The air emission inventory for the proposed development is provided as Table 5-21, Table 5-22, and Table 5-23.

Table 5-21: Air Emission Inventory for Air Quality Impact Modelling, Stack Sources

| Activity Name | Emission ID | Release Type | Stack Height (m) | Diameter (m) | Flowrates (m3/s) | Exit Velocity (m/s) | MGA 56 Coordinates | | Emission Rates | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | X (m) | Y (m) | $PM_{10}$ (g/s) | TSP (g/s) |
| Cement Loading to Silo 1 | CL1 | Stack | 17.514 | 1 | 4.5 | 5.7 | 304086 | 6254070 | $2.3 \times 10^{-06}$ | $2.3 \times 10^{-06}$ |
| Cement Loading to Silo 2 | CL2 | Stack | 17.514 | 1 | 4.5 | 5.7 | 304086 | 6254066 | $2.3 \times 10^{-06}$ | $2.3 \times 10^{-06}$ |
| Cement Loading to Silo 3 | CL3 | Stack | 17.514 | 1 | 4.5 | 5.7 | 304085 | 6254059 | $2.3 \times 10^{-06}$ | $2.3 \times 10^{-06}$ |
| Mixer Loading | ML | Stack | 23.34 | 1 | 4.5 | 5.7 | 304094 | 6254062 | $5.0 \times 10^{-05}$ | $5.0 \times 10^{-05}$ |

Table 5-22: Air Emission Inventory for Air Quality Impact Modelling – Volume Sources

| Activity Name | Emission ID | Release Type | Source Height (m) | Horizontal Spread (m) | Vertical Spread (m) | MGA 56 Coordinates | | Emission Rates | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | X (m) | Y (m) | $PM_{10}$ (g/s) | TSP (g/s) |
| Bucket Elevator | BESA | Volume | 9.11 | 1.92 | 4.56 | 304078 | 6254038 | $4.0 \times 10^{-05}$ | $7.8 \times 10^{-05}$ |
| Aggregate and Sand Stockpile 1 | AS1 | Volume | 12.02 | 4.51 | 6.01 | 304084 | 6254043 | - | - |
| Aggregate and Sand Stockpile 2 | AS2 | Volume | 1.00 | 4.51 | 0.50 | 304087 | 6254063 | $8.3 \times 10^{-05}$ | $1.6 \times 10^{-04}$ |

Table 5-23: Air Emission Inventory for Air Quality Impact Modelling – Area Sources

| Activity Name | Emission ID | Release Type | Effective Height (m) | Initial Sigma Z | MGA 56 Coordinates | | Emission Rates | |
|---|---|---|---|---|---|---|---|---|
| | | | | | X (m) | Y (m) | $PM_{10}$ ($g/m^2/s$) | TSP ($g/m^2/s$) |
| Raw Materials Dumping | RMD | Area | 1 | 0.25 | 304072 | 6254037 | $5.6 \times 10^{-08}$ | $1.1 \times 10^{-07}$ |
| | | | | | 304073 | 6254041 | | |
| | | | | | 304077 | 6254040 | | |
| | | | | | 304076 | 6254036 | | |
| Conveyor Belt 1 | CB1 | Area | 14.644 | 1 | 304079 | 6254039 | $2.8 \times 10^{-06}$ | $5.6 \times 10^{-06}$ |
| | | | | | 304084 | 6254052 | | |
| | | | | | 304087 | 6254051 | | |
| | | | | | 304084 | 6254035 | | |
| | | | | | 304078 | 6254037 | | |
| Weigh Hopper Loading 1 | WHL1 | Area | 2 | 0.5 | 304081 | 6254036 | $2.8 \times 10^{-04}$ | $5.4 \times 10^{-04}$ |
| | | | | | 304084 | 6254052 | | |
| | | | | | 304087 | 6254051 | | |
| | | | | | 304084 | 6254035 | | |
| Conveyor Belt 2 | CB2 | Area | 1 | 0.25 | 304082 | 6254035 | $3.2 \times 10^{-04}$ | $6.3 \times 10^{-04}$ |
| | | | | | 304085 | 6254052 | | |
| | | | | | 304080 | 6254053 | | |
| | | | | | 304081 | 6254063 | | |
| | | | | | 304083 | 6254062 | | |
| | | | | | 304082 | 6254054 | | |

Table 5-23: Air Emission Inventory for Air Quality Impact Modelling – Area Sources

| Activity Name | Emission ID | Release Type | Effective Height (m) | Initial Sigma Z | MGA 56 Coordinates | | Emission Rates | |
|---|---|---|---|---|---|---|---|---|
| | | | | | X (m) | Y (m) | $PM_{10}$ ($g/m^2/s$) | TSP ($g/m^2/s$) |
| Conveyor Belt 2 | CB2 | Area | 1 | 0.25 | 304087 | 6254054 | $3.2 \times 10^{-04}$ | $6.3 \times 10^{-04}$ |
| | | | | | 304084 | 6254035 | | |
| Skip Hoist | SH | Area | 1 | 0.25 | 304082 | 6254062 | $3.8 \times 10^{-04}$ | $7.5 \times 10^{-04}$ |
| | | | | | 304082 | 6254065 | | |
| | | | | | 304095 | 6254063 | | |
| | | | | | 304094 | 6254060 | | |
| Weigh Hopper Loading 2 | WHL2 | Area | 11 | 1 | 304083 | 6254059 | $4.5 \times 10^{-05}$ | $1.2 \times 10^{-04}$ |
| | | | | | 304085 | 6254071 | | |
| | | | | | 304094 | 6254063 | | |
| | | | | | 304094 | 6254060 | | |

### 5.2.8 Modelling Results

Predicted dust impacts using the AUSPLUME air model are shown in Table 5-24 to Table 5-27. These results indicate impacts of the proposed development with no additional control implemented. Note that the nearest residential locations are labelled as R1 to R9, while the nearest locations of waterways are labelled as RA to RE.

Table 5-24: Results for Particulate Matter <10µm, 24 Hours Averaging Period

| Receivers | Incremental Impact (µg/m³) | Background Air Quality (µg/m³) | Cumulative Impact (µg/m³) | Limit (µm/m³) | Pass (Yes/No) |
|---|---|---|---|---|---|
| R1 | 3.1 | 34 | 37 | 50 | Yes |
| R2 | 3.5 | | 38 | | Yes |
| R3 | 3.0 | | 37 | | Yes |
| R4 | 2.7 | | 37 | | Yes |
| R5 | 1.6 | | 36 | | Yes |
| R6 | 1.6 | | 36 | | Yes |
| R7 | 1.8 | | 36 | | Yes |
| R8 | 1.5 | | 35 | | Yes |
| R9 | 1.1 | | 35 | | Yes |
| RA | 1.9 | | 36 | | Yes |
| RB | 3.7 | | 38 | | Yes |
| RC | 3.3 | | 37 | | Yes |
| RD | 2.8 | | 37 | | Yes |
| RE | 2.0 | | 36 | | Yes |

Table 5-25: Results for Particulate Matter <10µm, 1 Year Averaging Period for Scenario 1

| Receivers | Incremental Impact (µg/m³) | Background Air Quality (µg/m³) | Cumulative Impact (µg/m³) | Limit (µm/m³) | Pass (Yes/No) |
|---|---|---|---|---|---|
| R1 | 0.2 | 18 | 18 | 30 | Yes |
| R2 | 0.2 | | 18 | | Yes |
| R3 | 0.2 | | 18 | | Yes |
| R4 | 0.2 | | 18 | | Yes |
| R5 | 0.1 | | 18 | | Yes |
| R6 | 0.1 | | 18 | | Yes |
| R7 | 0.1 | | 18 | | Yes |

| Table 5-25: Results for Particulate Matter <10µm, 1 Year Averaging Period for Scenario 1 | | | | | |
|---|---|---|---|---|---|
| Receivers | Incremental Impact (µg/m³) | Background Air Quality (µg/m³) | Cumulative Impact (µg/m³) | Limit (µm/m³) | Pass (Yes/No) |
| R8 | 0.1 | | 18 | | Yes |
| R9 | 0.1 | | 18 | | Yes |
| RA | 0.2 | | 18 | | Yes |
| RB | 0.5 | | 18 | | Yes |
| RC | 0.4 | | 18 | | Yes |
| RD | 0.2 | | 18 | | Yes |
| RE | 0.1 | | 18 | | Yes |

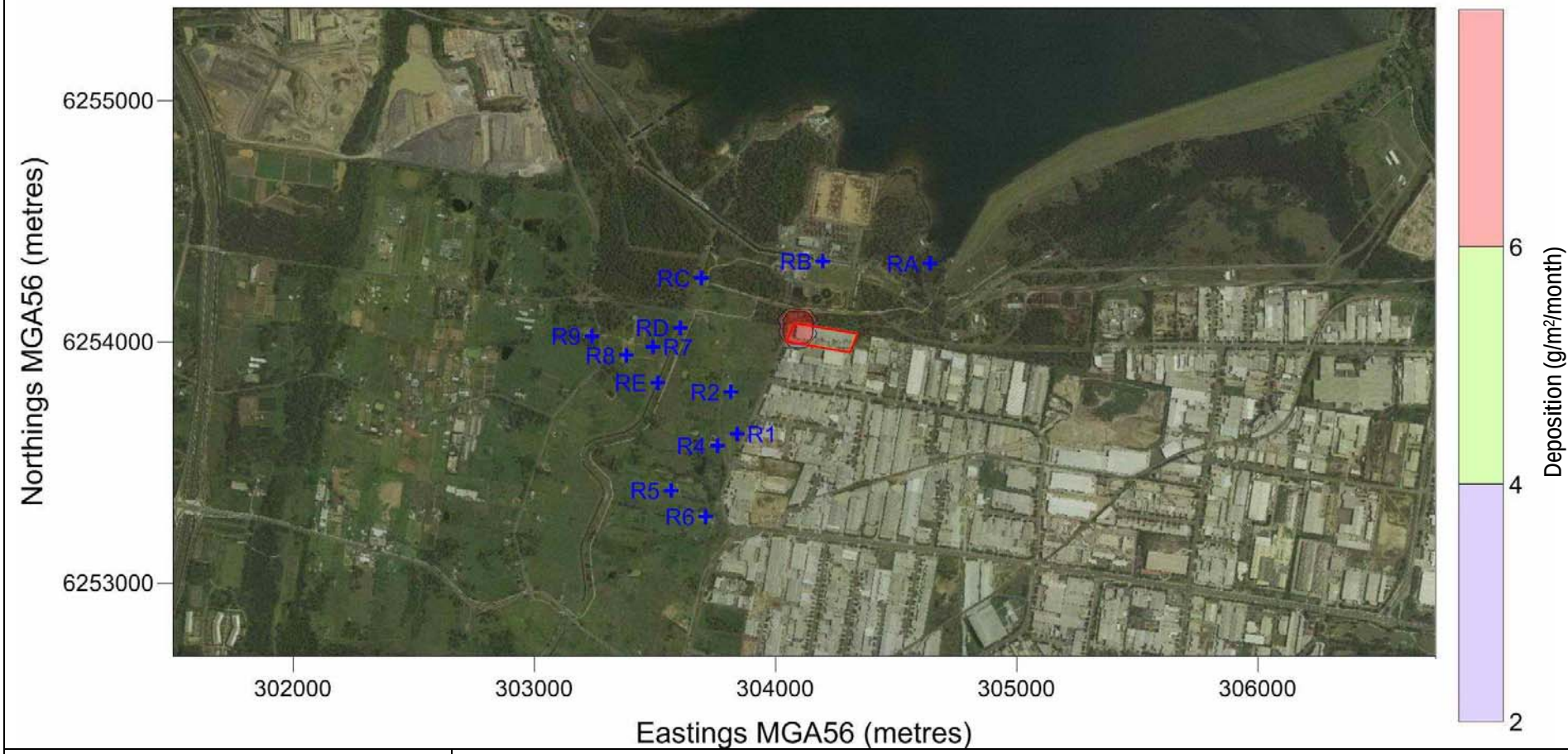
| Table 5-26: Results for Total Suspended Particulates, 1 Year Averaging Period for Scenario 1 | | | | | |
|---|---|---|---|---|---|
| Receivers | Incremental Impact (µg/m³) | Background Air Quality (µg/m³) | Cumulative Impact (µg/m³) | Limit (µm/m³) | Pass (Yes/No) |
| R1 | 0.5 | 35 | 36 | 90 | Yes |
| R2 | 0.5 | | 36 | | Yes |
| R3 | 0.3 | | 36 | | Yes |
| R4 | 0.3 | | 36 | | Yes |
| R5 | 0.2 | | 35 | | Yes |
| R6 | 0.3 | | 36 | | Yes |
| R7 | 0.3 | | 36 | | Yes |
| R8 | 0.2 | | 35 | | Yes |
| R9 | 0.1 | | 35 | | Yes |
| RA | 0.4 | | 36 | | Yes |
| RB | 0.9 | | 36 | | Yes |
| RC | 0.8 | | 36 | | Yes |
| RD | 0.4 | | 36 | | Yes |
| RE | 0.3 | | 36 | | Yes |

| Table 5-27: Results for Dust Deposition, 1 Year Averaging Period for Scenario 1 | | | | | |
|---|---|---|---|---|---|
| Receivers | Incremental Impact ($g/m^2$/month) | Background Air Quality ($g/m^2$/month) | Cumulative Impact ($g/m^2$/month) | Limit ($g/m^2$/month) | Pass (Yes/No) |
| R1 | 0.04 | 2 | 2 | 4 | Yes |
| R2 | 0.07 | | 2 | | Yes |
| R3 | 0.03 | | 2 | | Yes |
| R4 | 0.03 | | 2 | | Yes |
| R5 | 0.01 | | 2 | | Yes |
| R6 | 0.02 | | 2 | | Yes |
| R7 | 0.05 | | 2 | | Yes |
| R8 | 0.03 | | 2 | | Yes |
| R9 | 0.03 | | 2 | | Yes |
| RA | 0.07 | | 2 | | Yes |
| RB | 0.23 | | 2 | | Yes |
| RC | 0.13 | | 2 | | Yes |
| RD | 0.07 | | 2 | | Yes |
| RE | 0.04 | | 2 | | Yes |

The maximum air emission impacts were observed at Receptor RB (one of the nearest water bodies to the reservoir), which is to be anticipated due to its proximity to the site. The modelling results have predicted that the air impacts from the proposed development are very low, considering all results were below the DECCW-based assessment criteria.

Ground level concentration isopleths diagrams are presented in Figure 5-14, Figure 5-15, Figure 5-16, and Figure 5-17 below.

Figure 5-14: Dust Deposition Contour Isopleths Diagram – 1-Year Averaging Period



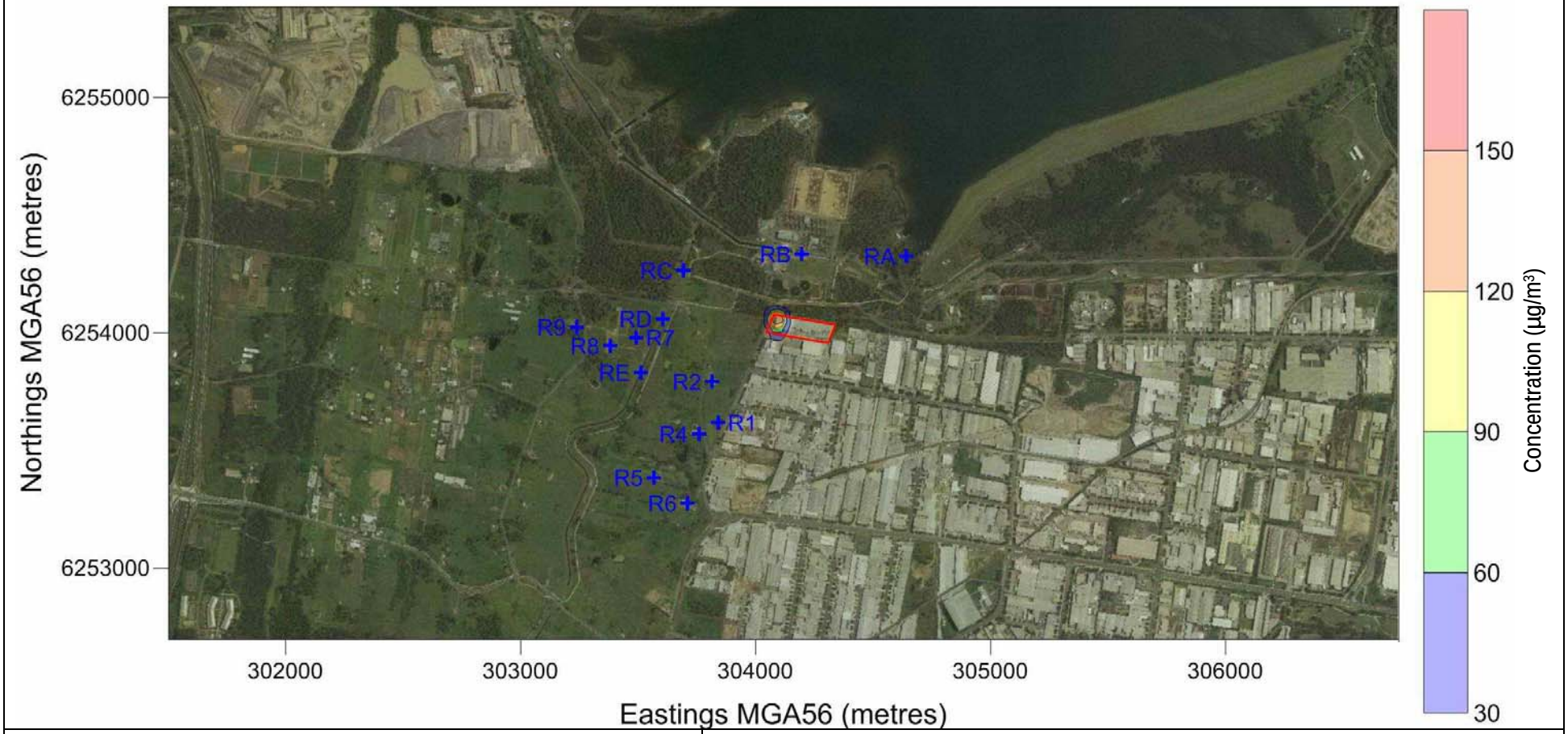

Legend:
- Boundary of the Subject Site
- Receptor Locations

Image Source: © Department of Lands 2008

Criteria: 4 g/m$^2$/month (1-Year Averaging Period, 100$^{th}$ Percentile)

Range of Concentration Results: 0 to 98 g/m$^2$/month

Figure 5-15: Total Suspended Particulates (TSP) Contour Isopleths Diagram – 1-Year Averaging Period, 100th Percentile



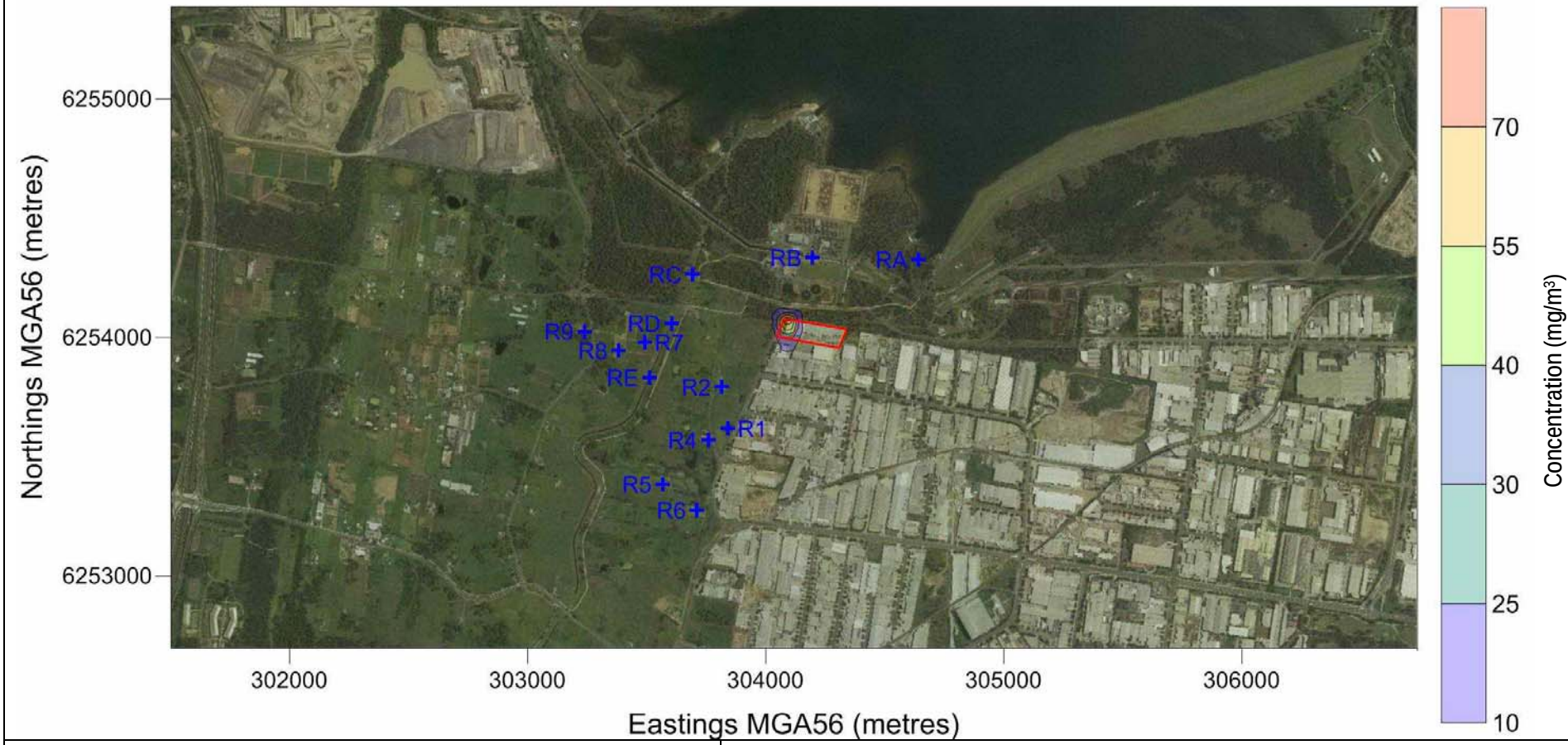

Legend:
- Boundary of the Subject Site
- Receptor Locations

Image Source: © Department of Lands 2008

Criteria: 90 µg/m³ (1-Year Averaging Period, 100th Percentile)

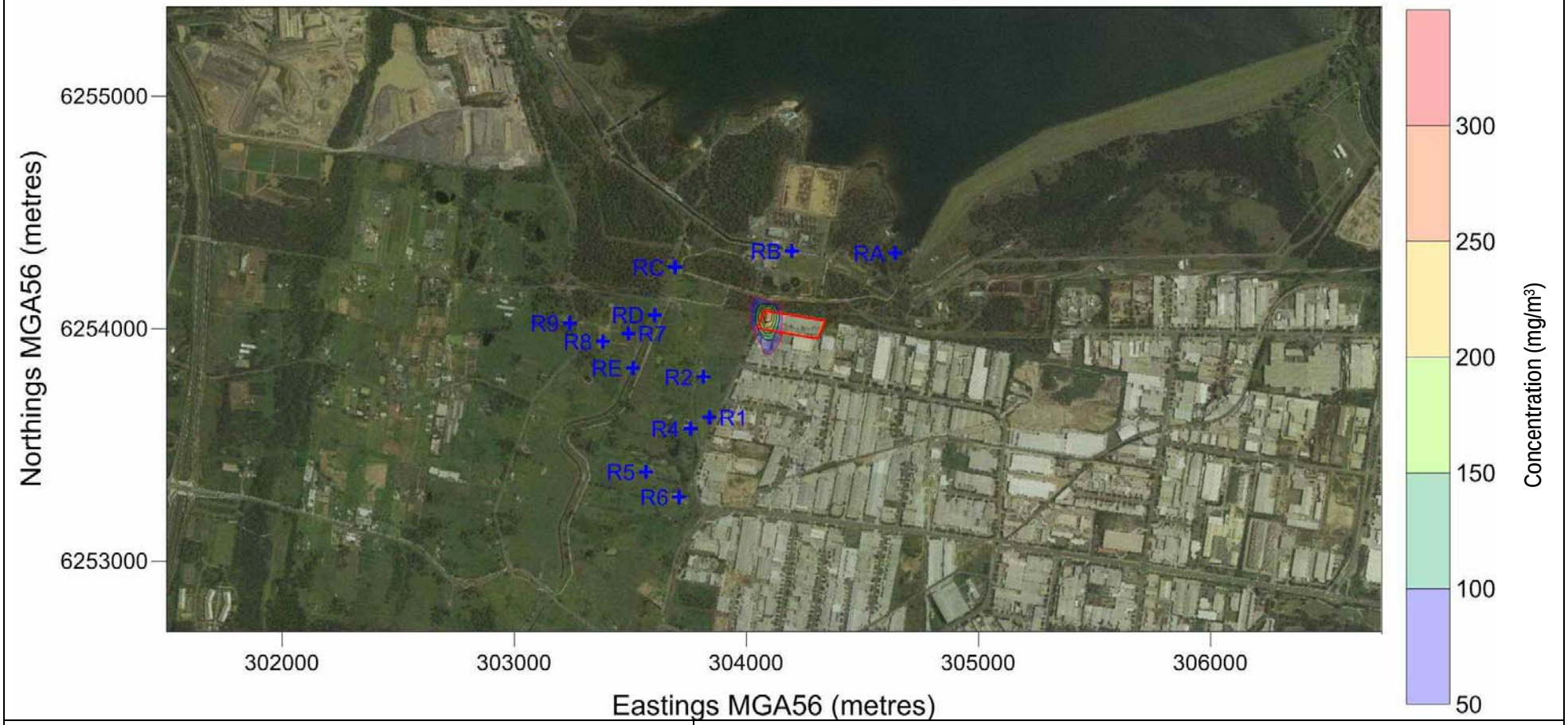
Range of Concentration Results: 0 to 149 µg/m³

Figure 5-16: Particulate Matter less than 10 µm ($PM_{10}$) Contour Isopleths Diagram – 1-Year Averaging Period, 100th Percentile




| | |
|---|---|
| Legend:<br>Boundary of the Subject Site<br>Receptor Locations | Image Source: © Department of Lands 2008 |
| | Criteria: 30 µg/m³ (1-Year Averaging Period, 100th Percentile) |
| | Range of Concentration Results: 0 to 76 µg/m³ |

Figure 5-17: Particulate Matter less than 10 µm ($PM_{10}$) – 24-Hours Averaging Period, 100th Percentile




Legend:
- Boundary of the Subject Site
- Receptor Locations

Image Source: © Department of Lands 2008

Criteria: 50 µg/m³ (24-Hours Averaging Period, 100th Percentile)

Range of Concentration Results: 0 to 293 µg/m³

### 5.2.9 Statement of Potential Air Impacts

The DECCW document "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales" has been followed in the preparation of this air quality impact assessment. The assessment criteria for the pollutants were used to determine whether the potential impacts from the site were within reasonable limits or in exceedances to the guidelines.

The emissions from the proposed operations were assessed conservatively using AUSPLUME. The predicted air impacts on the nearest identified residential areas were determined to not exceed the DECCW-based assessment criteria, which suggests that the predicted impacts from the proposed development are low. Exceedances to the criteria are not anticipated provided that best practice management is maintained on-site.

Given consideration to this assessment and its findings, it is concluded that air emissions from the subject site do not pose a significant impact to the existing air quality of the site location and are found to be in compliance with the DECCW guidelines.

## 5.3 WATER RESOURCES

Water resource management has been identified by key government stakeholders as an environmental aspect requiring careful consideration given that stormwater issues often arise in cases such as concrete batching plants.

The following sections provide further details of the water resource management to be conducted on site.

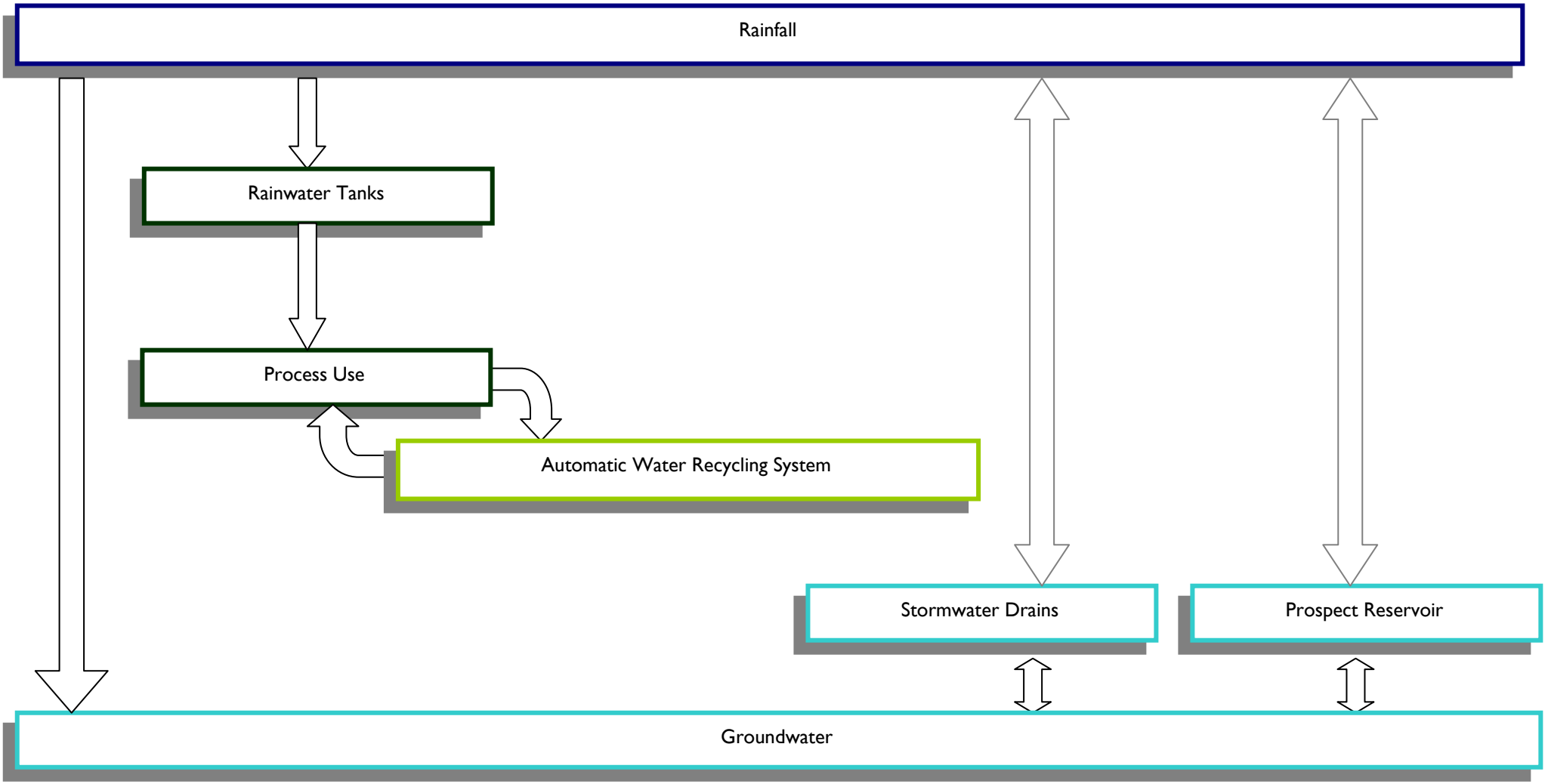
### 5.3.1 Water Interactions

The proposed development will implement control measures and actions that will enable the site to not alter any of the current ground and surface water interactions on site. The natural water balance shall be maintained through the proposed water management practices and design.

- Rainwater would be collected into the proposed rainwater tanks and would be segregated from areas where handling of high alkaline materials would occur. This is established by:
  - Roofing of areas where handling of material would occur; and
  - Bunding of areas where spill of materials may occur;
- Rainwater collected would be utilised as additional water for use in the process;
- Wastewater generated on site would be collected and treated by a fully automatic water recycling system.

No other surface water interactions are anticipated to occur except for the natural stormwater interactions, which is segregated from contamination from the processes on site. No groundwater interactions would also be anticipated. The following figure provides a summary of the water interactions on site.

Figure 5-18: Water Cycle of the Proposed Development



### 5.3.2 Ground Water

No impacts to ground water are anticipated.

Excavation works associated with the construction of the underground hopper would not cause any ground water impacts. Water tables encountered during excavation would be properly handled and managed using an environmental management plan.

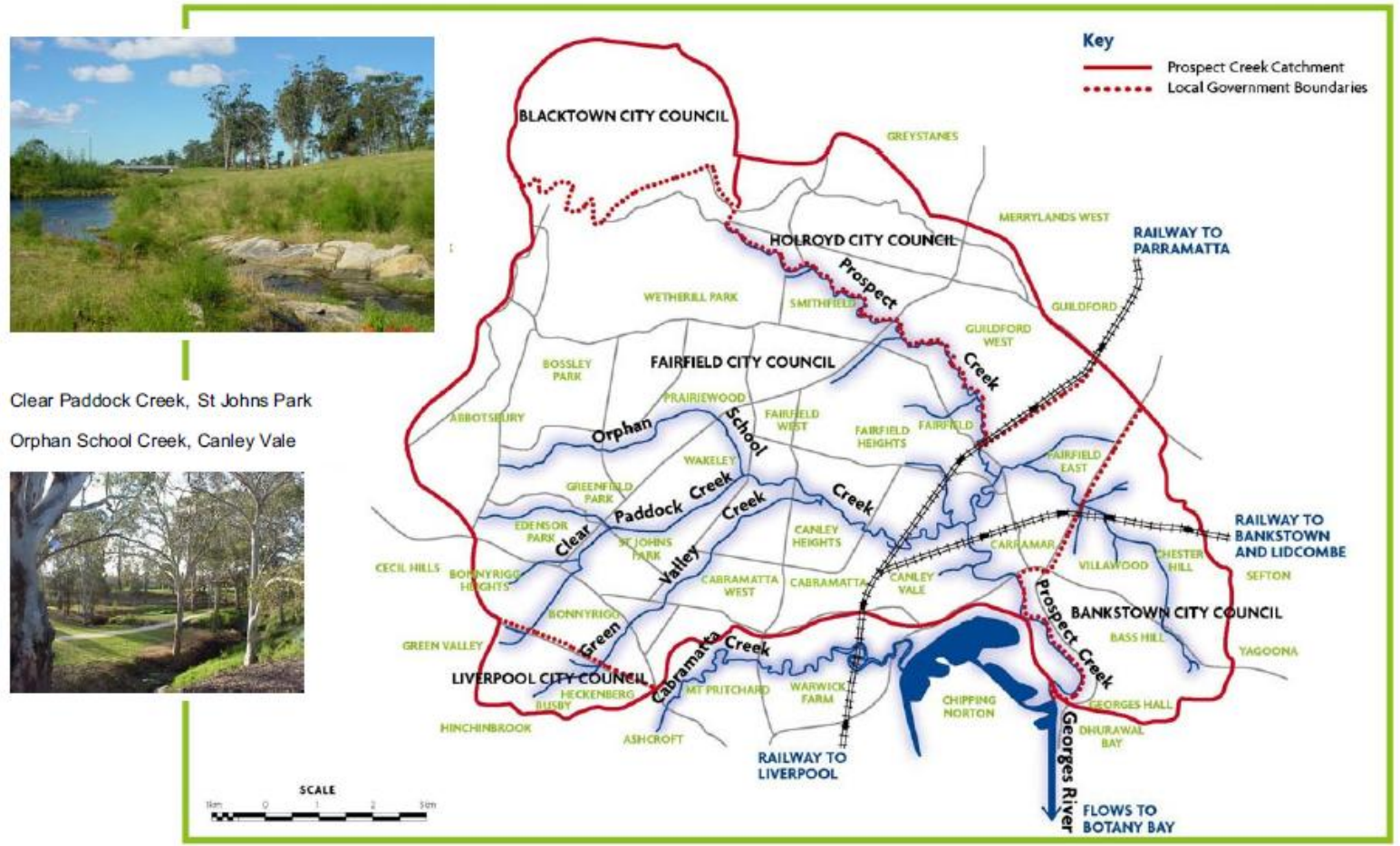
### 5.3.3 Surface Water

The site is located within the Prospect Creek Catchment, which covers an area of 98km$^2$ covering suburbs predominately within the Fairfield City and some areas within the Holroyd City, Bankstown, Blacktown and Liverpool. Prospect Creek Catchment is a sub-catchment of the Georges River catchment (see Figure 5-19). The closest waterway to the site is the Prospect Creek which flows to the Prospect Reservoir approximately 600 m north of the site. Prospect reservoir receives water from the Warragamba Dam. With approximately 50,000 million litres in capacity, it supplies water to the Sydney metropolitan area.

Apart from Wetherill Park, other areas that contribute to Prospect Creek water quality include part of Fairfield West, Fairfield Heights and Smithfield. Like Wetherill Park, these suburbs also consist of mixed land uses including industrial and residential.

Fairfield City Council has implemented a stormwater management plan to improve the water quality within the Prospect Creek catchment. The overall objectives are to reduce the impact on downstream catchment and to provide responsible planning and management systems. The proposed development would implement a water resource management plan, which would incorporate these objectives to support this initiative. This management plan is provided in Section 5.3.4.

Figure 5-19: South Creek Catchment Area




Source: Fairfield City Council 2003

### 5.3.4 Water Resource Management Plan

The purpose of this management plan is to outline the water resource management plan for the proposed concrete batching plant to be located at 33-41 Cowpasture Road, Wetherill Park. This plan provides guidelines for the site management to use in their on-going use of the site.

This water resource management plan has been prepared to assist in providing adequate protection of human health and the environment including soil erosion and the potential release of contaminants from the proposed and existing process areas.

During construction of the buildings and structures, and preparation of roadways and the hardstand areas, there is potential for soil erosion to occur. These matters are addressed in this section.

#### 5.3.4.1 Construction Activities

During construction of the proposed development, the following activities could give rise to soil erosion:

- Roadways and hardstand areas;
- Building foundations and floor.

Safeguards will be implemented to avoid soil erosion and stormwater contamination. This will be included in a management plan developed at Construction Certificate stage and include the standard sediment and erosion control measures used at construction sites.

As this is an operating site the current site activities need to be considered to avoid trafficked areas becoming a source of sediment release.

#### 5.3.4.2 Site Activities

Site activities that could give rise to soil erosion and release of contaminants are:

- Vehicle movements on site;
- Unloading and loading of materials;
- Handling of materials;
- External storage of materials; and
- Maintenance of equipment.

These activities would require appropriate control measures and have been discussed in Section 5.3.4.4.3.

### 5.3.4.3 Site Description Relevant to Stormwater and Wastewater

There is a downgradient to the south-southeast and any excess storm water runoff would discharge to the current offsite storm water infrastructure.

Typically, cement makes up only 10% of concrete; water and aggregates comprise 90% of the concrete mass. Therefore, the sustainable management of the site's aggregates and wastewater is recommended.

It is understood that the fully automatic water recycling equipment for the on-site process water and aggregates will be supplied by BIBKO. The systems are further explained under Section 5.3.4.4.3.

### 5.3.4.4 Potential Impacts and Safeguards

#### *5.3.4.4.1 Construction*

Erosion and sedimentation potential is at its greatest during the construction phase as the surface soil is removed for the roadways and foundations. Hardstand areas would be graded and covered with roadbase. No soils would need to be removed from site. Potential contaminants are detailed in the following table.

Table 5-28: Potential Contaminants

| Potential Contaminant | Potential Source Area | Potential Source of Contaminants | Potential Impact on Stormwater |
|---|---|---|---|
| Petrol, diesel, oil, grit/soil. | Truck, car and forklift parking. | Leaking fluids from parked vehicles. | Contamination of stormwater and sedimentation of local waterways. |
| Petrol, diesel, oil, grit/soil. | Driveways. | General use of vehicles resulting in deposition of petroleum product. | Contamination of stormwater and sedimentation of local waterways. |
| Grit/soil. | Driveways, roadway. | Sediment. | Release into local waterway. |
| Petrol, diesel, oil, grit/soil. | Forklift, excavators. | Spill of fuel. | Contamination of local waterway. |

Appropriate controls are described in the following sections.

#### *5.3.4.4.2 Erosion and Sedimentation Controls*

The erosion and sedimentation controls considered necessary consist of the following:

- The perimeters of disturbed areas would require double silt fences.
- Trafficked areas onto site would first be stabilised with roadbase before extensive construction works commences.

- The stormwater drainage system at the entrance to the site would be protected from release of sediment into the kerbs and inlet sumps.
- Internal roadways and hardstand areas would be protected from scour/erosion using staked straw bales.
- Any high run-off areas would similarly be protected.
- Grassed areas would be maintained on the downgradient areas after the hardstand areas are constructed. Drainage from the hardstand areas would occur along the perimeter of these areas using a contour bank to reduce the stormwater velocity and prevent scouring/erosion.
- The sediment and erosion controls would be routinely cleaned of accumulated silt before more than 70% of their capacity is lost.
- The work carried out for stormwater management would be in accordance with the document 'Managing Urban Stormwater – Soil & Construction', 4th Edition (Landcom 2004).

Site management practices would include the following:

- No refuelling of machinery near stormwater drains.
- No maintenance of machinery outside of covered work areas.
- No external or uncovered storage of oil or fuel in drums, batteries or machinery components that contain surfaces that are oiled or greased.
- Any storage of oil, fuel or batteries shall be on bunded pallets inside a designated, signposted area within the building.
- A spill response kit for hydrocarbons would be kept maintained adjacent to this storage area.
- A plan of the site shall be prepared and erected in the office area showing the designated storage areas for the variety of metal wastes that would be accepted on site.
- Bin storage would be on an asphalted or concreted area suited to this activity.
- Litter controls would be instigated with waste bins. The bins would be regularly monitored for integrity to prevent any uncontrolled leaks.
- The site would be kept in a tidy condition.
- Stock rotation would occur so that redundant machinery or scrap does not remain dormant on site.

*5.3.4.4.3 Operational*

Wastewater is typically generated due to the following processes of concrete production:

- Wash water from the cleaning of the two mixers;
- Excess water from concrete mixtures; or
- Water that contains quantities of concrete ingredients from any combination of the processes.

In order to minimise wastewater outputs from the onsite Concrete Production Operations (CPO), the following considerations have been made.

Concrete Washing

To reclaim the sand and gravel from the onsite processing wastewater, the BIBKO Concrete Washer includes a reclaimer, cement water reuse system and slurry water tank. This means highly alkaline slurry will be channelled into the slurry water tank to prevent it from reaching storm water drains.

The manufacturer recommends below ground installation for the slurry water tank and the reclaimer, backfilled with gravel. This system has a concrete wash-out capacity of up to 6, 12 and 18 $m^3/h$ with a high discharge level up to 2.5m. This would allow the filtered processing wastewater to be reused hence reducing freshwater consumption.

Any retained concrete from the on-site central mixing area as well as any wash out water are recommended to be stabilised overnight with the aid of a hydration stabilising admixture. The resultant stabilised slurry would then be incorporated into the next mixture hence minimising excess processing wastewater.

Material Handling

Areas where handling will be conducted would be roofed and bunded, allowing segregation of high-alkaline substances from stormwater run-off. Process wastewater would be collected by a fully automatic water recycling system, which will recycle the process water back into the process. Waste generated would be segregated from all other water interactions on site.

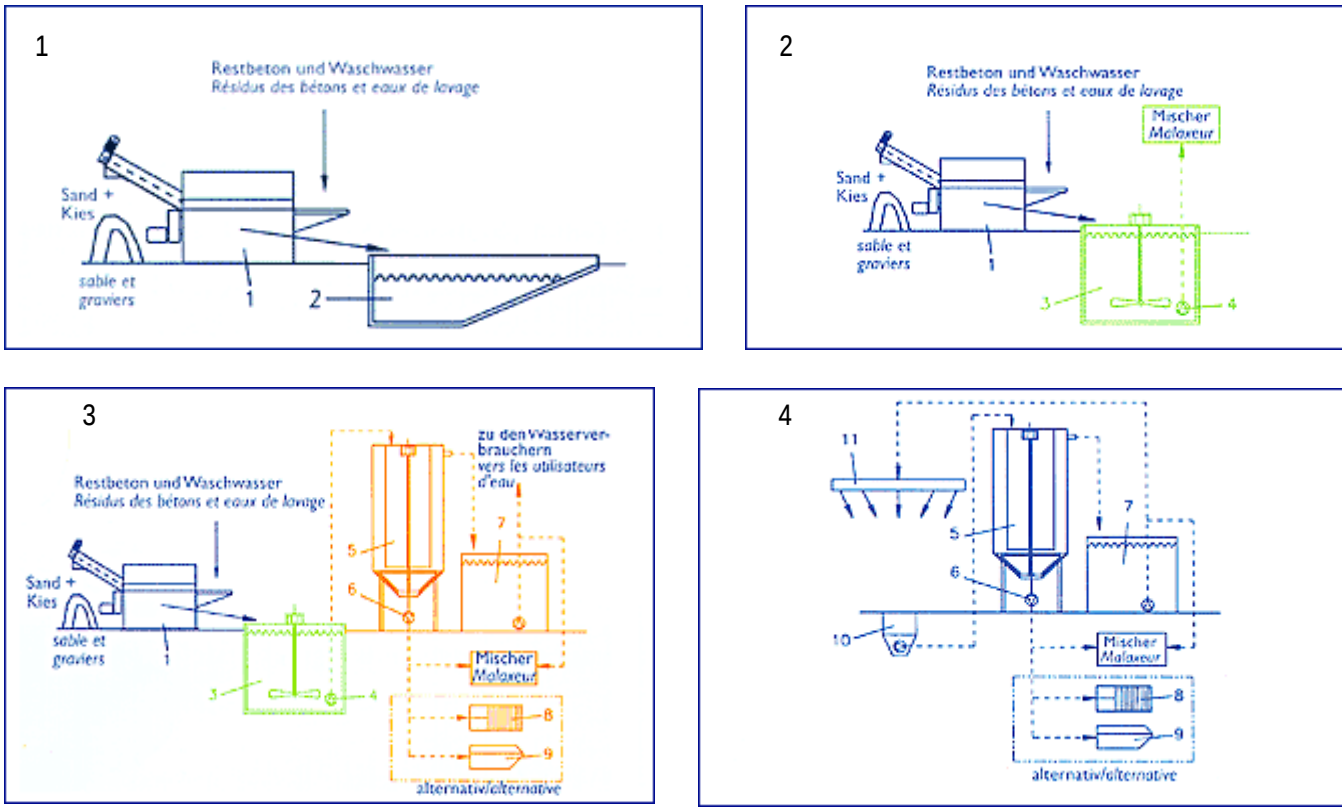
Lip seals between the constructed building / structure walls and the proposed bunding, prevent leeching of spilled materials that may potentially run through any gaps or cracks that could develop.

## Processed Water Clarification

Further to the BIBKO Concrete Washer system described above, the BIBKO Clarification System enables the clarified water to be reused for batching, grinding and wash out of the central mixer.

Schematics for the clarification process are provided in Figure 5-16:

Figure 5-20: Bibko Clarification System




Source: BIBKO 2010

Further to the abovementioned systems, the BIBKO Clarification Machine offers a clarifying capacity of up to 15m$^3$/h without flocculation and prevents build up at the base of the machine via mechanisms that provide scraping of the entire width of the machine. This machine caters for wastewater from grinding, sawing or water-blasting of hardened or partially hardened concrete.

Close and continuous monitoring of the quality of the water is recommended to account for its cementitious properties, solids content, as well as other properties. Quality monitoring of the captured wastewater will ensure its suitability for reuse without adversely affecting the workability, strength and durability of the concrete.

### 5.3.4.5 Potential Flood Impacts

Given the information provided in Section 4 which contains information on the terrain elevation of the site location and its immediate surrounding terrain, the site is located within a low-risk flood plain. Therefore, it is considered that potential flood impacts to the site are low, and that no detailed flood impact assessment is warranted.

## 5.4 SOIL

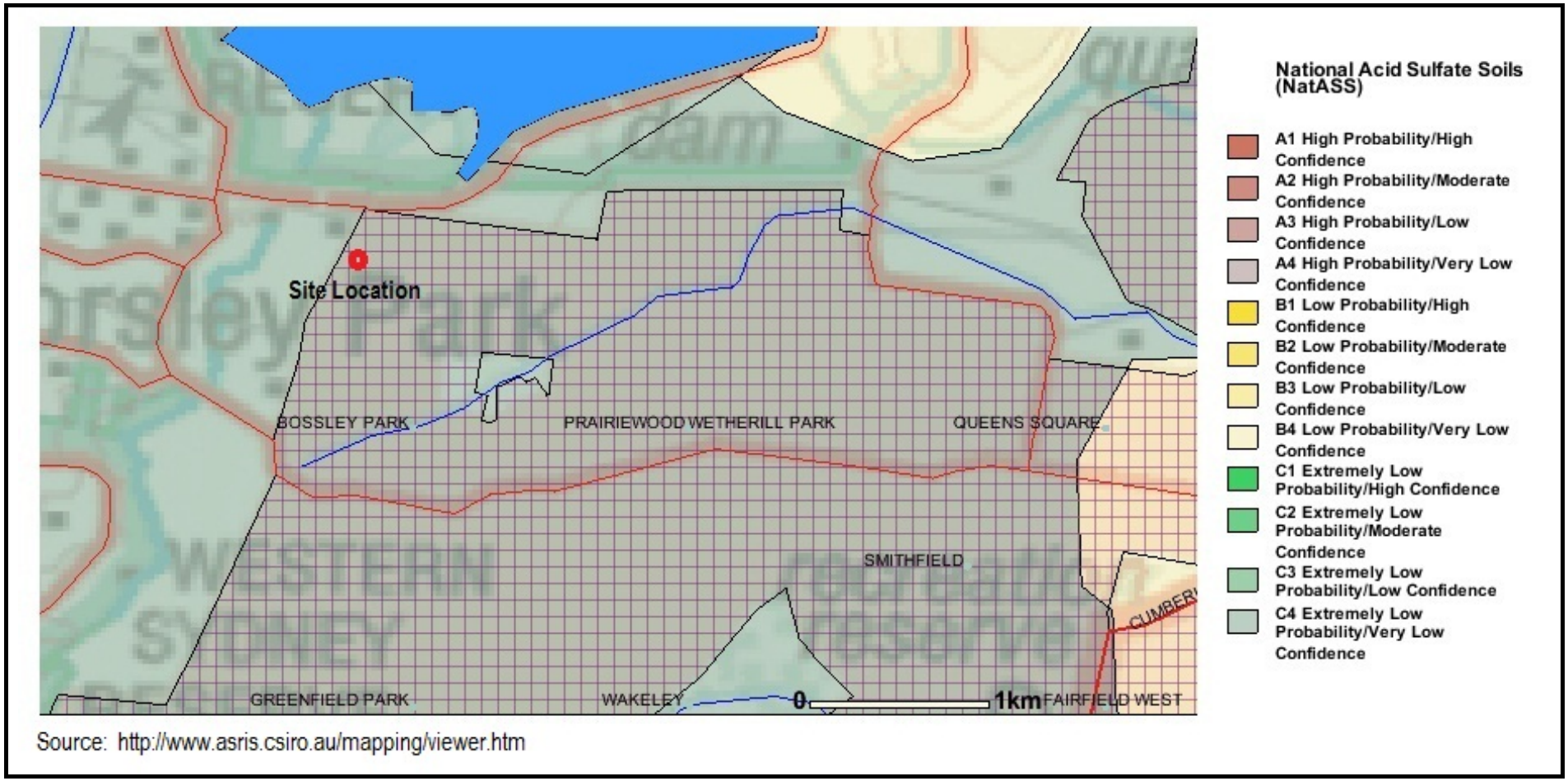
The only soil environmental aspects identifiable are impacts caused during construction. These are discussed as follows.

### 5.4.1 Acid Sulfate Soils

A search from the Atlas of Australian Acid Sulfate Soils database developed by the CSIRO shows that there is a low to very low probability of finding acid sulphate soils on the subject site or within close proximity to the site. A map is shown in Figure 5-21 to illustrate these findings.

Given the outcomes of this search, further acid sulphate soil investigations and assessments were not required and undertaken.

Figure 5-21: Acid Sulphate Soils Map




Source: http://www.asris.csiro.au/mapping/viewer.htm

## 5.5 FLORA AND FAUNA

No flora and fauna impacts are associated with the proposed development, considering that the site location is a developed industrial premise. The location of the proposed concrete batching plant does not contain any existing flora and fauna that could be harmed as part of the proposed development.

## 5.6 WASTE GENERATION AND MANAGEMENT

Waste is described within the DECCW Waste Classification Guidelines as:

a) any substance whether solid, liquid or gaseous that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment; or
b) any discarded, rejected, unwanted, surplus or abandoned substance; or
c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, reprocessing, recovery or purification.

Waste would be generated and handled throughout each stage of the development. Waste that is generated must be classified in accordance with the DECCW Waste Classification Guidelines as one of the following:

- Special waste;
- Liquid waste;
- Hazardous waste;
- Restricted solid waste;
- General solid waste (putrescible); and
- General solid waste (non-putrescible).

Classification of waste enables the generator to determine the appropriate handling, transport and disposal requirements if the waste cannot be reused or recycled.

Special, hazardous and restricted wastes are not anticipated to be generated throughout the development. Waste streams and respective management are described and identified for each stage. A summary of waste classification and management is provided in Table 5-29.

### 5.6.1 Site Establishment Waste

Site preparation would generate temporary waste streams including construction waste and excavated soil.

#### 5.6.1.1 Excavated Soil

Excavated soil will be created during the construction of the underground hopper. It is anticipated that soil of up to 6.6 metres to 8 metres below ground shall be dug, with a cross sectional width and length of 5 metres each. This equates to a volume of 200 $m^3$ of soil to be excavated for the underground hopper.

#### 5.6.1.2 Vegetation

Minor amount of vegetation is present at the location of where the proposed concrete batching plant will be located, and it is anticipated that some (if not all) of the vegetation in this area would be removed. This would include grasses, weeds and shrubs. These would be transported to a waste management facility accepting green waste. Any waste associated with re-vegetation activities throughout the development would be removed by landscape contractors.

#### 5.6.1.3 Construction Waste

Constructing site infrastructure would generate construction material waste off-cuts including plasterboards and metals, in addition to general rubbish. This rubbish could be directed to Brandown recycling at Kemps Creek. Any plasterboard and metal wastes generated could be sent to Eco Cycle Materials at Wetherill Park and Sims metal recycling at Wetherill Park.

### 5.6.2 Operational Waste

Waste generated during the operation of the existing precast concrete facility is very minor, given that the nature of precast concrete products manufacturing is an “all-in, all-out” basis. This means that all ready-mix concrete currently received on site must solely be used for the production of precast concrete products. Losses in raw materials would result in increase in waste generated and loss of business revenue, hence this is not encouraged, has not occurred as part of the existing operations, and is not likely to occur as part of the proposed development.

Minor waste generated on site includes the following:

- Office waste;
- Process / ready-mix concrete waste;
- Metal trimmings waste; and
- Leftover concrete block waste.

Details of transfer and disposal of these wastes are discussed as follows.

#### 5.6.2.1 Office Waste

General office waste, typical of any office would include domestic putrescible waste and recyclable paper and cardboard. General waste would be collected by a licensed waste contractor for disposal and recycling off-site. Office waste has been generated as part of the existing development and will continue to be generated as part of the proposed development.

#### 5.6.2.2 Process Waste

Ready-mix concrete waste generated from the process is generated after daily washing of the proposed central mixer / mixing line, where raw materials are placed to produce ready-mix concrete. Waste of this nature is sent to the fully-automated water recycling system where water would be separated from the solid cementitious material. Water from this recycling system is re-used in the process, whereas the aggregate is washed and dried and reused.

#### 5.6.2.3 Metal Trimmings

Metal trimmings generated on site are very minor, given that most metal support constructs are mostly consumed for precast concrete panel production. It is anticipated that this type of waste would increase, given the increase in production. However, given that metal trimming waste generated from the current site is very minor in quantity, this type of waste would still remain to be minimal as part of the proposed development.

#### 5.6.2.4 Leftover Concrete Products

It is anticipated that, as concrete blocks or panels are manufactured on site, leftover of these panels such as broken blocks, rocks and pebbles are generated on site.

It is understood that these leftover concrete products would be collected on site temporarily and be sent to a building demolition and construction recycling facility.

These materials are considered inert when made as part of the process and would not cause any environmental impacts.

### 5.6.3 Summary of Waste Generation and Management

Table 5-29 presents a summary of the waste generation and management associated with the proposed development including the waste types that would be generated, the estimated quantity, classification in accordance with the DECCW Waste Classification Guidelines and how each waste type would be managed.

Table 5-29: Waste Management – Waste Generated by the Proposed Development

| Waste Type | Estimated Quantity | Classification [a] | Management |
|---|---|---|---|
| Construction material off-cuts | <5 T [b] | General solid waste (non-putrescible) | Retained on-site for recovery processing and sale |
| Process waste / ready-mix concrete waste | None generated as all waste is fully recycled and reused on site. | Liquid waste | Treated on site with BIBKO water recycling system and water re-used into the process. Solid waste is recycled either into the process or by an off-site facility. |
| General office waste | >20 T/yr [d] | General solid waste (putrescible) | Collected by licensed waste contractor for disposal |
| Paper waste | >5 T/yr | General solid waste (non-putrescible) | Recycled off site |

Notes: [a] Classified according to the DECCW's Waste Classification Guidelines.
[b] During construction only.
[c] During operation, quantity in per annum basis.

Waste would be managed according to the Protection of the Environment Operations (Waste) Regulation, 2005. This would be carried out following the hierarchy of waste management:

1. Avoid waste;
2. Re-use waste;
3. Recycle/reprocess; and
4. Dispose.

Waste minimisation and resource recovery would be practised as part of the company's commitment to the principles of Ecological Sustainable Development (ESD). Further waste management and waste minimisation measures shall be detailed in a Waste Management Plan (WMP) prepared prior to site construction and occupation.

General waste management is outlined below:

- All waste should be segregated where possible;
- All waste (recyclable and non-recyclable) shall be stored appropriately and in designated waste storage areas;
- Classified waste must be tracked using the DECCW's waste tracking system for listed wastes. These typically include chemical wastes. Austral Precast Pty Ltd have a responsibility to be aware of the classification of all wastes generated to ensure that management is in compliance with waste legislation; and
- A Waste Management Plan would be prepared for the site to address waste management (construction and operation) and minimisation procedures.

# 6. ENVIRONMENTAL IMPACTS AND SAFEGUARDS – SOCIAL IMPACTS ASPECTS

## 6.1 HEALTH

### 6.1.1 Introduction

Health impacts of this development have been addressed with reference to the Health Impact Assessment Guidelines (enHealth 2001). The Health Impact Assessment (HIA) process covers the following steps:

1. Screening – Determining the need for a Health Impact Statement;
2. Scoping – Identifying the impacts that need to be assessed, the boundaries of these impacts, and additional tasks and requirements to complete the assessment;
3. Profiling – Establishing a profile of communities likely to be impacted. Collecting data required to assess health impacts;
4. Risk Assessment – Assessing the significance of health impacts by qualitative and/or quantitative measures;
5. Risk Management – Investigation options to minimise potential risks;
6. Implementation and decision making – Justifying significant health impacts and providing recommendations to reduce potential impacts; and
7. Monitoring, environmental and health auditing, post-project evaluation – Evaluating health impacts and the success of the Health Impact Assessment and monitoring plans following development approval and implementation of recommendations.

Each of these seven aspects is now examined.

### 6.1.2 Screening

Screening is an integral part of the HIA and the overall screening process. All proposed developments that are required to undergo an EIA should be screened for possible health impacts (enHealth 2001).

Providing the nature of the health concerns are common for many industries, and the potential for impacts to be mitigated, a full scale Health Impact Assessment is not considered to be warranted. This is the case for this proposal as there would be no hazardous materials being brought to the site or handled on site.

### 6.1.3 Scoping

Environmental, physical and social health impacts associated with the development are listed in the following table.

| Table 6-1: Potential Health Impacts Associated with the Development | | |
|---|---|---|
| Health Aspect | Positive Impacts | Negative Impacts |
| Environmental | • Austral Precast will serve the local region. The proposal would replace the need to have a pre-mixed concrete delivered frequently to the site in small batches, reducing health impacts associated with long-distance transport. Eg. Greenhouse gas emissions, air pollution, potential vehicle accidents. | • Increasing resource use (energy and water) on site.<br>• Noise and dust impacts from the concrete batching operation. These will have minimal off-site impacts due to the presence of emission control equipment such as enclosure and bag house. |
| Physical | | • Irritation to eye or to respiratory tract – coughing due to dust (or Total Suspended Particulates –TSP). As previously noted, due to the presence of enclosure and dust emission controls therefore off-site impacts will be negligible. |
| Social | • The development would increase employment opportunities in the region.<br>• Economic "spin-off" effects in the local region. | • Should environmental impacts not be controlled, environmental nuisances could restrict outdoor recreation of nearby residences.<br>. |

Air contaminants associated with extractive operations and demolition material processing are identified as presenting the greatest concern and form the main focus in this section. These include:

- Fine particulate matter ($PM_{10}$ and $PM_{2.5}$);and
- Total Suspended Particulates.

The proportion and concentration of these contaminants will vary depending on the volume of concrete produced.

### 6.1.4 Profiling

The proposed site is situated approximately 40 km west of the Sydney, within the Fairfield City Council jurisdiction. Excepting the population of Wetherill Park, the community most affected by potential health impacts of the site are the residences closest to the site. These residences have been modelled in the air and noise impact assessment where they are referred to as receptors. Demographic information on these receptors is not known.

The demographic profile of the Wetherill Park suburb, as indicated by the 2006 Australian Census (Australian Bureau of Statistics 2006) is as follows:

Table 6-2: Wetherill Park Demographics (2006 Australian Census)

| Profile Parameter | Quantity |
|---|---|
| Personal Characteristics | |
| • Population | 6,127 |
| • Female | 3,042 |
| • Male | 3,085 |
| Age | |
| • 0-4 years | 290 |
| • 5-14 | 814 |
| • 15-24 years | 1,107 |
| • 25-54 years | 2,558 |
| • 55-64 years | 806 |
| • 65 years and over | 552 |
| • Median age of persons | 35 |
| Labour Force | |
| • Total labour force (includes employed and unemployed persons) | 3,101 |
| • Employed full-time | 1,957 |
| • Employed part-time | 729 |
| • Employed away from work | 85 |
| • Unemployed | 203 |
| • Not in the labour force | 1,740 |

### 6.1.5 Risk Assessment and Management

Total Suspended Particulates and particulate matter of less than 10 μm in diameter ($PM_{10}$) are likely emitted particularly during processing loading and handling of raw materials and processing raw materials in the central mixers.

The storage of raw materials (sand and aggregates) would be in enclosed silos rather than the conventional stockpiling system – this eliminates particulate emissions due to wind erosion. In addition, to the enclosures, other air emission controls would also be implemented including dust collectors on the cement silos and central mixers.

The internal road and driveways to the site are sealed and raw materials will be delivered in covered trucks therefore the level of emission due to transport is considered insignificant.

Fine particulate matter would enter the body through inhalation. Particulate matter could have the following health effects:

- Toxic effects by absorption of the toxic material into the blood if lead, cadmium or zinc is present;
- Allergic or hypersensitivity effects (e.g. some woods, flour grains, chemicals);
- Irritation of mucous membranes; and
- Increased respiratory symptoms, aggravation of asthma and premature death. The risks are highest for sensitive groups such as the elderly and children (Department of the Environment, Water, Heritage and the Arts). The dusts will contain crystalline silica.

### 6.1.6 Statement of Potential Health Impacts

The potential off-site health impacts from dust generation are considered minimal as all activities associated with the concrete batching activity will be adequately controlled to achieve minimal or negligible emissions.

The monitoring, auditing and evaluation stage of the HIA process is typically undertaken 12-18 months following the HIA completion (http://www.health.nsw.gov.au). As such it is not considered within the context of this report.

### 6.1.7 Employee Health and Safety

The health and safety issues associated with the facility would primarily relate to handling and processing of raw materials. All employees would undergo appropriate training as part of site induction. The employer would ensure the operation is conducted as approved and appropriate resources are available for work safety. The development operation would be required to comply with the following Acts and Regulations relating to health and safety:

- Occupational Health & Safety Act 2000; and
- Occupational Health & Safety Regulations 2001;

## 6.2 HAZARDS AND SECURITY

### 6.2.1 Overview

The site contains features that if improperly handled or managed may constitute a threat to the site and surrounding environment. Aspects primarily considered are hazards generated by human beings.

The first aspect would be unintentional hazards caused either on-site or off-site with the potential to impact site operations. This includes aspects of operations such as accidents and unforeseen incidents during the course of day to day operations. All risks such as spills, fires and impact accidents would be identified and mitigated through an emergency response plan for the site.

The second is intentional hazards caused either on-site or off-site with the potential to impact site operations. The emergency control plan for the site will identify potential intentional hazards such as arson, bomb threats, civil disturbances, theft and wilful damage and address mitigation measures for site operations.

The third consideration is natural hazards which are present at the site. These include aspects such as storms including hail and strong wind damage, flooding and bushfires.

All aspects identified above and those identified during the course of risk assessments at the site would determine inclusions and controls in the Emergency Response Plan.

Controls for the identified hazards would be mitigated permanently where appropriate, otherwise Automatic, Physical, Procedural and Behavioural controls would be put in place to further reduce potential for incident occurrence.

### 6.2.2 Chemicals and Dangerous Goods

The raw materials for producing concrete are neither hazardous nor classified as dangerous goods. As previously mentioned, the raw materials would typically consist of cement, sand, aggregates and additives. There are two types of additives that would be received on site in liquid form. These are Adva (or equivalent) and Daracel (or equivalent) and the MSDS for these chemicals have been included as Attachment 7. There would be up to 10,000 L of additives stored on site. Note that these are non hazardous.

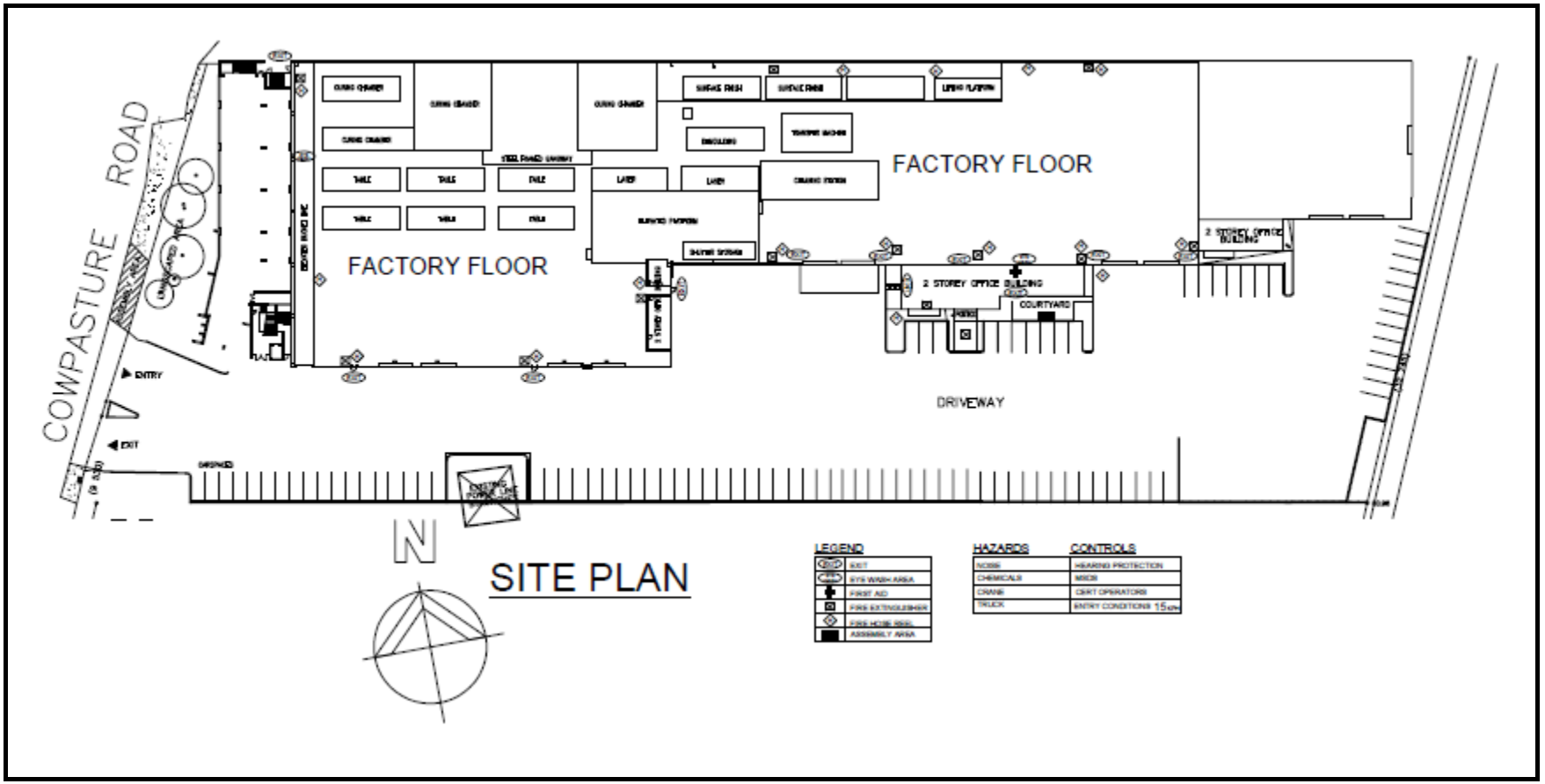
### 6.2.3 Site Security

The site is secured by the existing man-proof boundary fencing.

### 6.2.4 Fire Safety

The existing factory unit 1 would be used to house the concrete batching equipment including conveyors and associated transfer system and the central concrete mixers. This building is equipped with fire protection systems including fire hydrants, hose reels and extinguishers. The fire safety system will reduce the potential fire intensity, assist in evacuating employees from the building and significantly assist the NSW Fire Brigade in fire prevention. The locations of fire safety equipment are illustrated in the Fire Safety Drawing provided below as Figure 6-1.

Figure 6-1: Fire Safety Drawing



A fire safety study has been conducted in June 2005 by Benbow Environmental (Dick Benbow & Associates 2006) (Ref: 15015fssrep and 15015_fss_rev2) for the existing factory unit 1 to ensure compliance with the performance requirements of the Building Code of Australia (BCA). Currently this building is used as to produce pre-cast concrete products which present a minimal fire hazard. A no smoking policy is enforced in the building and all employees are regularly trained in aspects of fire prevention.

In summary, the site has fire services in place that address the requirements of BCA. There are no flammable or combustible materials involved with the operation and no hazardous processes associated with the proposed concrete batching plant. With proper maintenance of equipment, particularly electrical machinery, the presence of ignition sources would be minimal if not negligible. Given this consideration an upgrade to the existing fire services on site would not be required.

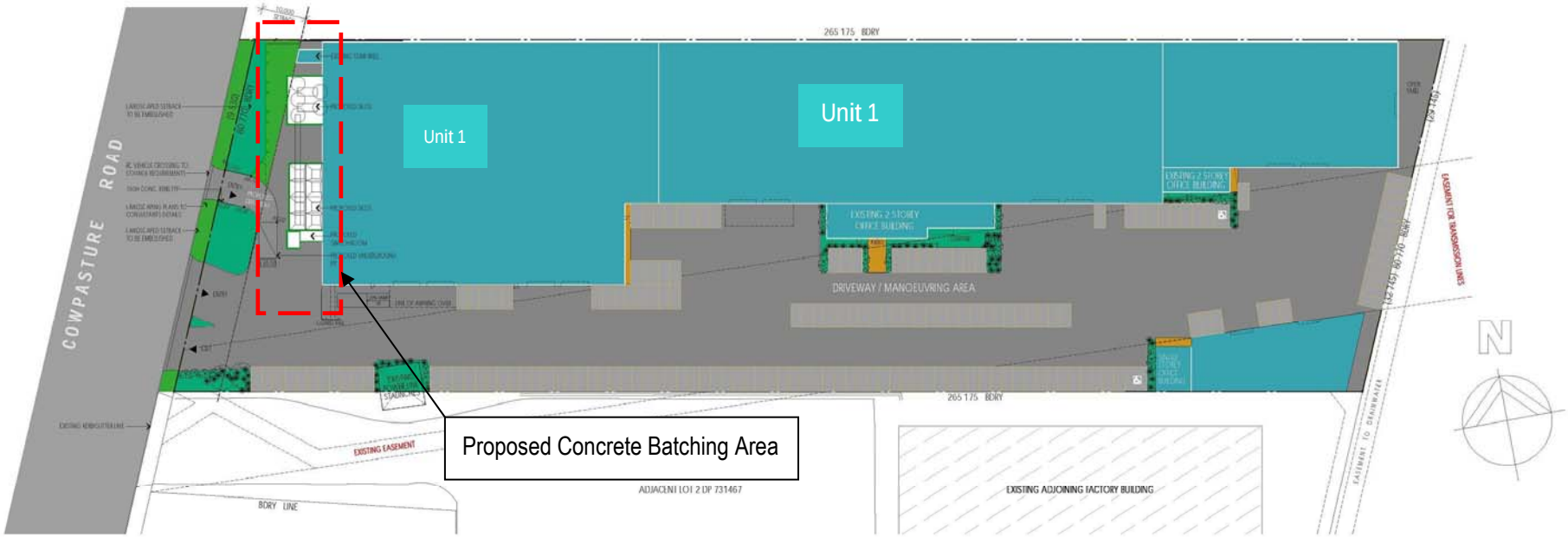
## 6.3 VISUAL AMENITY

This section addresses the visual aspects of the proposed development.

### 6.3.1 Existing Visual Amenity

The existing visual amenity is one that is typical of an industrial area. The land surrounded the subject site is dominated by industrial installations. There are currently four main factory units on site, two 2 storey office buildings located south of Unit 2 and Unit 3 and one single storey office building located west of the existing factory Unit 4. The site layout showing existing buildings and proposed areas to be altered to house the concrete batching plant is shown in Figure 6-2.

Figure 6-2: Site Plan Showing Existing Buildings and Proposed Development Area




Source: © Algorry Zappia & Associates Pty Ltd, Project No. P3383, Oct 2010 (Algorry Zappia & Associates 2010)

### 6.3.2 Visual Impacts of the Development

The existing factory buildings on site would not be altered. The raw materials storage areas would be located west to the existing factory unit 1, with at least 10 m setback to the Cowpasture Road boundary. The raw materials storage would consist of 5 cement silos and 8 silos for sand and aggregates. The height of these silos would not be higher than the existing building i.e. up to approximately 17.5 m. These silos would be shielded with a colourbond metal clad structure and painted in similar colour to the rest of the buildings on site. The silos are therefore hidden and would look like building structures from the street view. Trees and landscaped areas would also be maintained or additional vegetation added as required to enhance the visual amenity of the site. The site would also be fully fenced.

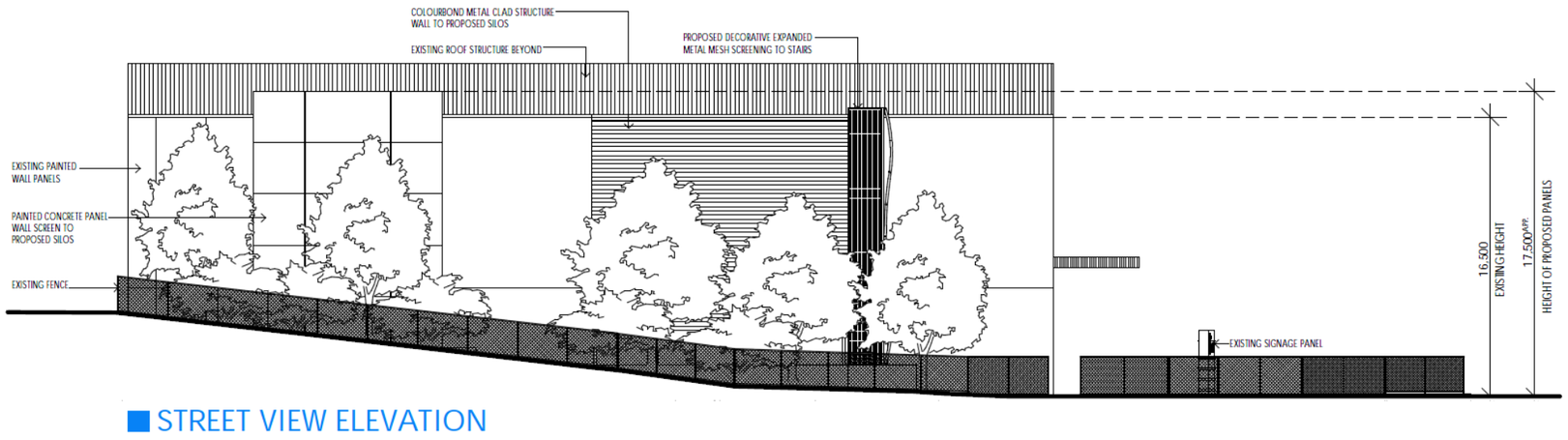
The central mixers would be located in an enclosed area, partially inside the existing factory unit 1, therefore would not be visible from outside. Figure 6-3 and Figure 6-4 describe the street view of the site from the entry point at Cowpasture Road.

Figure 6-3: Street View of the Site from Cowpasture Road (with Colours)


Source: © Algorry Zappia & Associates Pty Ltd
(Algorry Zappia & Associates 2010)

Entry Point

Figure 6-4: Street View of the Site from Cowpasture Road (with Dimensions)




Source: © Algorry Zappia & Associates Pty Ltd
(Algorry Zappia & Associates 2010)

### 6.3.3 Statement of Potential Visual Impacts

The potential visual impacts from the proposed concrete batching plant will be minimised through the control measures including shielding of storage areas, vegetation and landscaping. The proposed development would therefore have a minimal impact to the existing visual amenities of the industrial estate.

## 6.4 HERITAGE

The site is not listed as being a heritage item or containing items under Schedule 4 of the Fairfield City Council Local Environmental Plan 1994.

A search of the NSW State Heritage Register was also conducted. The nearest heritage items within the vicinity of the site were found approximately 300 m west at Trivet Street and at the park behind the site along Chandos Road (Group of Hoop Pines) and at the Prospect Reservoir located 300 m north of the site (Upper Canal System – part of the Upper Nepean Scheme that spans from Pheasant's Nest Weir on the Nepean River to Prospect Reservoir via various suburbs including Fairfield). The activities proposed on site however would not pose negative impacts to these sites and therefore no further heritage studies were justified.

### 6.4.1 Aboriginal Heritage

No Aboriginal heritage locations have been identified or uncovered in the vicinity of the site as stated in the local heritage register.

### 6.4.2 European Heritage

No European heritage locations have been identified or uncovered in the vicinity of the site as stated in the local heritage register.

## 6.5 SOCIO-ECONOMIC ENVIRONMENT

### 6.5.1 Introduction

Wetherill Park is part of the vibrant and growing economy of Fairfield City in the western region of Sydney. Fairfield City contains large-scale industrial estates at Wetherill Park (where the site is located) and Smithfield. It covers a large area of 27 suburbs which are reasonably populated. The following description of the Fairfield area is taken from the Fairfield City Council Website.

> *"Fairfield city covers an area of some 104 km$^2$, incorporating 27 suburbs. Fairfield City is home to 179,893 people and it is one of the most culturally diverse cities in Australia with more than half of all residents having been born overseas, mostly in non-English speaking countries. The majority of residents speak a language other than English at home, the most common being Vietnamese, Arabic, Assyrian, Cantonese and Spanish.*

*While mainly residential, the City contains large-scale industrial estates at Wetherill Park and Smithfield, as well as local industrial centres. There are two major business and retail centres at Fairfield and Cabramatta, a growing centre in Prairiewood and a number of suburban shopping centres. Large expanses of rural land characterise the suburbs of Horsley Park and Cecil Park. There are 580 parks (60 of which are major parks) plus the NSW Government's 5,500 hectare Western Sydney Regional Parklands.*

Source: Fairfield City Council, 2010

### 6.5.2 Existing Socio-Economic Environment

#### 6.5.2.1 Employment

The following summarises the employment profile based on the 2006 census conducted by the Australian Bureau of Statistics.

The employment status of the local residents of Wetherill Park is quite diverse. The median weekly individual income of the local residents of Ingleburn is $412 whilst the median weekly household income is $1,148. These figures are in line with the Sydney metropolitan area.

The size of labour force residing in Wetherill Park in 2006 was 3,101 persons, of which 729 were employed part-time (23.5%) and 1,957 were full time workers (63.1%). The type of employment undertaken by the labour force is quite diverse, the highest being clerical and administrative workers (18.6%) followed by technician and trade workers (16.7%), labourers (13.2%), professionals (11.5%), sales workers (11.5%), machinery operators and drivers (10.6%), managers (8.2%) and community and personal service workers (7.1%). This range of skills would be relevant for fulfilling the potential new employment opportunities resulting from the proposed development.

The proportion of unemployed person is 6.5% which is slightly higher than the average for Australia (5.2%).

#### 6.5.2.2 Economic Activities

Fairfield City Council welcomes and supports investors who intend to do business in the area. Below are some of the advantages that the Fairfield City offers for businesses:

- *A strategic location – closeness to major markets in Sydney, good access to other parts of New South Wales;*
- *Good infrastructure of roads, rail, telecommunications network – a vital factor for companies with extensive transportation requirements;*
- *A strong manufacturing, professional service and retail base;*
- *Affordable industrial, commercial and residential property options with potential for capital growth;*
- *A strong manufacturing, professional service and retail base;*

- *Skilled and motivated workforce;*
- *Education and training opportunities at university and Technical and Further Education colleges that can deliver industry-focused training to your requirements and ensure a continuity of trained workforce;*
- *Significant public facilities, vibrant retail and entertainment sectors, excellent recreational opportunities;*
- *A Council committed to supporting industry and actively contributing to the growth and development of the City and its economy;* and
- *A City and community that welcomes new residents and industry.*

Source: Fairfield City Council, 2010

The Smithfield and Wetherill Park Industrial Estates has become the hub of manufacturing and distribution in Greater Western Sydney due to the strategic location between the major population and urban growth zones in the north west and south west of Sydney. There are over 1,000 active industrial sites employing more than 20,000 people.

The Council supports the growth of industrial activities in these areas by competitively pricing and centrally locating sites close to customers and their workforce. These factors are further enhanced by the presence of excellent infrastructure including access to motorway and rail links to sea and airports.

The location of the proposed development is therefore appropriate and would support the Council's intention to grow the economy within the area by providing employment opportunities.

### 6.5.3 Socio-Economic Impacts of the Development

The development of this site supports local employment and Australian-owned business ventures.

The proposed development would benefit the local economy, with the majority of these benefits generated from new employment positions, the multiplier effects, achieving sustainability, and the onsite reuse of waste materials generated from the processes.

When operating at full capacity the proposed development will support a maximum of 14 new employment positions.

The introduction of any development into an area has a multiplier effect within the local economy as local products and services are purchased by the new facility and the local employees and contractors spend wages within the vicinity. There has been no attempt to quantify the economic benefits that these complex economic interdependencies deliver on the proposed development, although this does not reduce the reality of their impact.

### 6.5.3.1 Greenhouse Gas Emissions

Greenhouse gases are essential to sustain life on earth by trapping the sun's heat and preventing this warmth escaping the atmosphere. Without these naturally occurring, heat trapping gases – mainly water vapour, $CO_2$ and methane, the earth would be too cold to inhabit.

The rapid increase of carbon dioxide and other greenhouse gases during the 20th Century are of a growing concern due to their impact on climate change. The UN Intergovernmental Panel on Climate Change states "There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activity".

The proposed development involves a number of activities, such as operation of machinery and transportation associated with the resource recovery process. All of these activities impact the generation of greenhouse gases.

Fossil fuels such as coal, oil and natural gas, are a major source of the world's energy and one of the significant contributors to human generated greenhouse gas emissions. Methane, another of the greenhouse gases has 21 times as much global warming potential as carbon dioxide.

The generation of greenhouse gases such as, carbon dioxide ($CO_2$), carbon monoxide (CO), oxides of nitrogen ($NO_x$), sulphides ($SO_x$) and traces of non-combustible hydrocarbons ($C_xH_x$) are considered in the following sections. Greenhouse gas emissions related to the development also need to be considered in the broader context of the associated reduction of greenhouse gases related to the end use and full life cycle of the products produced.

A preliminary assessment of the greenhouse gas emissions from the site have been conducted on a comparative basis. Items used as part of the site activities are assessed against alternatives that have a more efficient potential outcome. The proposed operations consist of recycling activities that would be more efficient than producing virgin materials which could offset some of the greenhouse gas generating activities.

### 6.5.3.2 Greenhouse Gas Emissions from Site Operations

The site operations and management have environmental commitment at the forefront of management thinking. The proposed development will use electrical power for materials handling and operation of the central mixers. This benefit the need to use more efficient processes Section 6.9 details the site operations from a carbon perspective.

### 6.5.3.3 Greenhouse Gas Emissions from Transport

The amount of greenhouse gas emissions due to transport would be minimal as there would be minimal vehicular movement within the site. The finished concrete product is not required to be transported off-site as it will be transferred to the adjacent pre-cast concrete plant for further processing. The proposed development will reduce the diesel fuel usage as truck deliveries to the site will reduce.

Transport emission would slightly increase due to indirect emissions from increasing number of employees commuting to the site. This increase however would be very minimal if not negligible.

### 6.5.4 Statement of Potential Socio-Economic Impacts

The proposed operations will provide job opportunities in the western area of Sydney in line with business turnovers and market forces.

The operations would also support local jobs in associated industries such as construction industries, transport, service professionals and contractors.

The operations would support Australian businesses investing in the project, generating resources for the government through taxes which are distributed for the wider benefit of the community through community services, infrastructure and government.

## 6.6 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Ecological sustainability requires a combination of good planning and an effective and environmentally sound approach to design, operations and management. The principles of ESD throughout the project's life cycle are outlined in the following paragraphs.

Decision making should be based on sound environmental management principles which consider not only the present, but also the future, particularly in relation to:

- Precautionary principle – if threats of serious or irreversible environmental damage exist, lack of full scientific evidence should not be used as a reason for postponing measures to prevent environmental degradation;
- Inter-generational equity – the present generation should ensure that health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- The conservation of biodiversity and ecological integrity – the conservation of biological diversity and ecological integrity should be a fundamental consideration; and
- The valuation of the environment and resources and the establishment for the efficient use of resources.

The above principles have been incorporated into the need for the project and overall design which is reflected in the studies prepared in this document. The EIS outlines safeguards that would be implemented on site so that the proposed operations would cause minimal harm to the environment and resources would be sustained to ensure availability to future generations, through reducing the communities need for virgin resources.

The main environmental safeguards to be implemented so that environmental harm is minimised as much as practicable are as follows:

- Surface Water Management;
- Noise Mitigation;  and
- Dust and Particulates Control.

The proponents would pro-actively manage those areas of their operations that have the potential to impact on the surrounding environment.

Multiple indicators, including those indicated in the Environmental Management Plan would continue to monitor the sustainable performance of the development.

The multiple indicators used to measure sustainability cover a broad range.  These indicators are outlined below.

Table 6-3: Indicators Used to Measure Sustainability

| Indicators | Comments and Description |
|---|---|
| Input rule | Renewables: The depletion rates of renewable resources would be within the regenerative capacity of the natural system that generates them.<br>Non-renewables: The depletion rates of non-renewable resources would be equal to the rate at which sustained income or renewable substitutes are developed by human intervention or investment. |
| Output rule | The waste emission rates or other forms of degradation will be reduced from current levels, which is within the capacity of the environment to assimilate or regenerate, without unacceptable degradation of the ecological integrity, biodiversity or its future waste absorptive capacity. |
| Community | • Increase in employment opportunities;<br>• Level of social services available increased;<br>• Strengthening of local economy;<br>• Level of education/knowledge based/research investment increased;<br>• No net loss of heritage, buildings, places of high community importance;<br>• No net loss of flora and fauna species or natural environments of high community importance;<br>• No loss of community integrity;<br>• Increase in resource recovery; and<br>• Increase in waste re-use and recycling. |
| Ecosystems | • No net reduction in richness or abundance of plant species in aquatic or terrestrial environments;<br>• No net reduction in richness or abundance of fauna species in aquatic or terrestrial environments;<br>• Net gain in the existing landscaping of the site to provide diversity and further habitat for local fauna;<br>• Increased or improved knowledge of ecosystem resources and management of threats;<br>• No net increase of pests or disease threats to the health of the ecosystem; and<br>• Reduction of natural hazards which are threats to the health of the ecosystem (fire, pollution, etc.). |
| Soils | • No net topsoil erosion;<br>• No increase in area of land affected by salinisation; and<br>• No reduction in soil pH below certain levels. |
| Water | • Stormwater released off site, Wastewater treated for reuse;<br>• No net increase in levels of acidification or toxic substances, heavy metals, nutrient and sediment levels; and<br>• No net reduction of water bodies as aquatic habitats. |
| Air | • No net reduction in air quality;<br>• Programs in place to reduce release of “greenhouse” gases due to transportation; and<br>• Comparable reduction in the use of “greenhouse” gas emissions through site location and management. |
| Energy | • Programs to reduce the use of fossil fuels for transportation;<br>• Reduction in energy consumption through increase in recycling content in product, consolidation, location and facility design; and<br>• Increase in efficiency of transport for inputs and outputs. |

The environmental management plan will be used to maintain the principles of ESD. The environmental management plan will be continually updated to ensure all new environmental measures are incorporated in line with the precautionary principle.

## 6.7 ROAD, TRAFFIC AND TRANSPORT

This section of the EIS provides an assessment of the traffic impacts of the proposed development. The assessment has been carried out having regard to the requirements of the RTA's Guide to Traffic Generating Developments.

### 6.7.1 Legislative Requirements

Developments which are required to be referred to the RTA are listed in Schedule 3 of State Environmental Planning Policy (Infrastructure) 2007. Pursuant to that schedule, industrial developments not having access to a classified road involving less than 20,000sqm GFA are not required to be referred to the RTA.

We further note that traffic impacts have not been identified as a key information requirement in the Director General's Requirements, as advised by DECCW letter dated 18 October 2010.

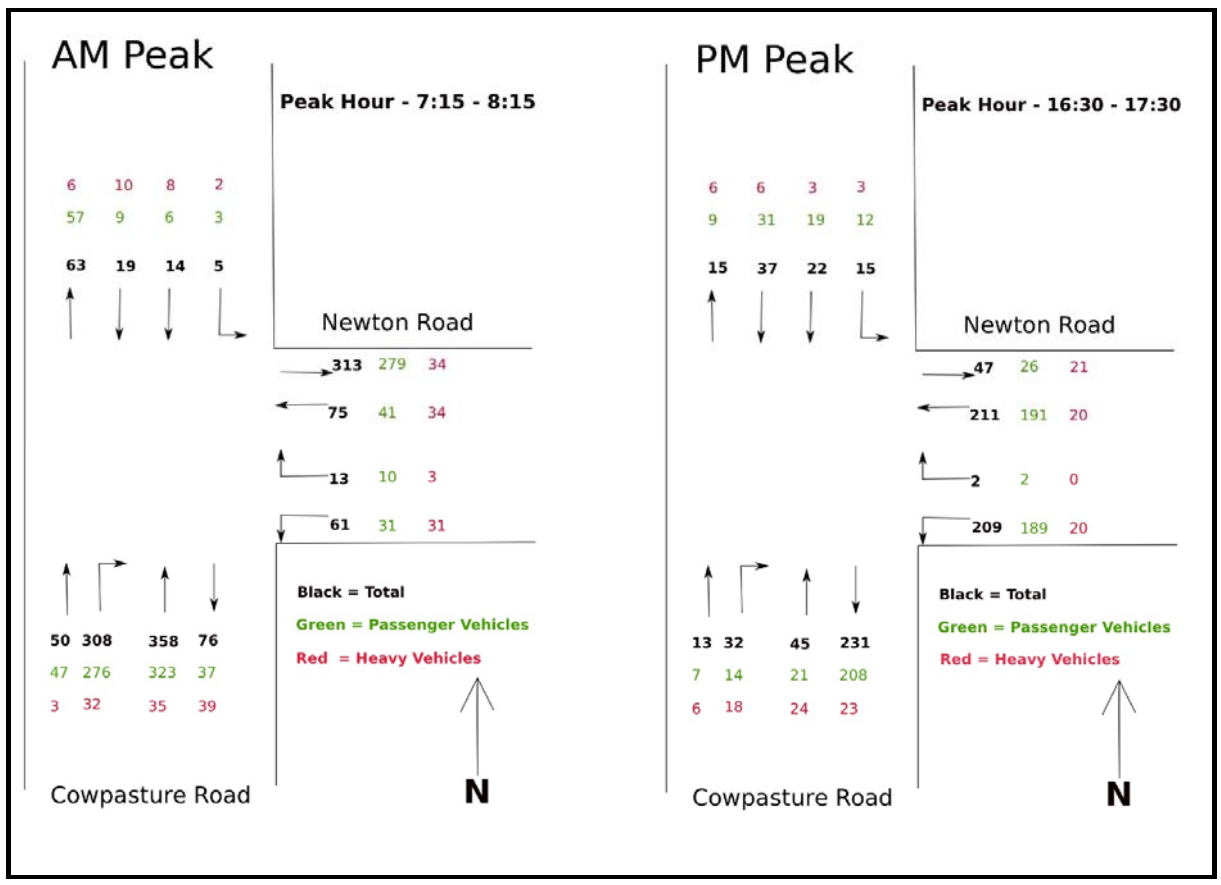
### 6.7.2 Existing Traffic Conditions

In the vicinity of the subject site, Cowpasture Road is a two lane undivided and unlinemarked carriageway. It is provided with formed kerb on its eastern side only. North of its intersection with The Horsley Drive, Cowpasture Road provides an access road function under the Sydney conurbation road hierarchy.

Approximately 165m to the south of the subject site, Cowpasture Road intersects with Newton Road as a T-intersection under priority control. Newton Road is a two lane undivided carriageway with linemarking providing one through lane and one kerbside parking lane in each direction. Newton Road provides a local collector function and provides connectivity between Cowpasture Road and Victoria Street.

Existing traffic volumes at the intersection of Cowpasture Road and Newton Road have been surveyed by manual count on 12 November (PM Count) and 16 November (AM Count). Figure 5-18 provides a diagrammatic summary of this information.

Figure 6-5: Intersection Count Summary




The above volumes show a tidal flow coming from The Horsley Drive, along Cowpasture Road and turning right into Newton Road in the AM peak and reversing its direction of flow in the PM peak.

The above volumes, coupled with observation of intersection operation suggest that the intersection is currently operating with minimal delays and at a Level of Service B.

### 6.7.3 Existing Development Traffic Generation

In the present situation, the existing business produces 25,000m$^3$ of precast concrete panels. The raw material used for the production of precast panels is ready mix concrete. In the present situation, this is delivered to the site via truck mounted mixers having a capacity of 12m$^3$. Consequently, the existing business involves approximately 2000 truck mounted mixer deliveries or 4000 movements per annum. The business presently operates 8 hours a day, 5 days per week, excluding public holidays. Allowing for 250 operational days per annum, the existing daily truck mounted mixer volume is 16 movements. The nature of the business operations requires ready mix concrete to be delivered in the first 4 hours of operation to enable setting and curing time during the remainder of the day. Consequently, the existing incoming product hourly volume is 4 movements per hour.

Outgoing product is transported by large rigid vehicle at an average frequency of 15 to 20 outgoing movements per day (adopt 1 peak hour movement).

The business presently employs 54 staff which would be expected to result in 25 to 30 peak hour movement. We note in this regard that the Cowpasture Road / Newton Road AM peak northbound through movement volume shows 47 passenger vehicle movements. This volume is shared among three industrial business and accordingly, 30 peak hour movements associated with the subject site should be viewed as a worst case scenario.

### 6.7.4 Existing Traffic Generation Summary

The following table provides a summary of the transport profile of the existing development.

Table 6-47: Transport Profile of Existing Development

| Generation Source | Vehicle Type | Daily Volume [a] | Peak Hour Volume |
|---|---|---|---|
| Incoming ready mix concrete | In-transit Mixer with 12m$^3$ capacity | 16 daily movements | 4 peak hour movements |
| Outgoing Product | Large Rigid Vehicle | 15-20 daily movements | 1 peak hour movement |
| Staff | Passenger vehicle | 60 daily movements | 30 peak hour movements |

### 6.7.5 Development Generated Traffic

The proposed development will increase the operational output of the existing business from 25,000m$^3$ to 60,000m$^3$ per annum and will result in an increase of 14 staff.

Nevertheless, as a result of the proposed development batching ready mix concrete on site, there will no longer be a requirement for truck mounted mixers to deliver ready mix concrete to the site. Instead, there will be deliveries of raw materials to produce ready mix concrete. Each of the component materials (cement, sand and aggregate, fly-ash and slag will be delivered in larger rigid dump trucks typically having a capacity of 32$m^3$. Accordingly, incoming product will be delivered by 1875 large rigid vehicles per annum. Allowing for 250 operating days per annum, this represents 7.5 trucks per day. The proposed development also involves increasing shift structures to two shifts per day. This amendment to business operations means that raw material to produce ready mix concrete does not need to concentrate in the morning hours of operation, but rather can be spread more evenly over the course of the business day.

Accordingly, it is likely that the proposed development will result in only 1 peak hour heavy vehicle movement associated with the delivery of incoming product, which is a reduction of 3 peak hour movements compared with the existing situation.

The volume of outgoing product increases to approximately double the existing outgoing volume. Accordingly, 55 truck daily movements and 2 peak hour movements are adopted.

In terms of heavy vehicle movements therefore, the proposal reduced incoming product delivery by 3 movements and increases outgoing product delivery by 1 movement, resulting in a net reduction of 1 peak hour movement.

The proposed 14 additional staff are likely to result in a maximum of 7 additional peak hour passenger vehicle movements.

### 6.7.6 Post Development Traffic Impacts

The proposed development results in no net change to heavy vehicle peak hour traffic generation and accordingly, there are no traffic impacts arising from heavy vehicle movements too and from the site.

The 7 additional peak hour passenger vehicles movements associated with 14 additional staff represents only a modest increase in traffic volumes on the surrounding road network. At the intersection of Cowpasture Road and Newton Road, being the closest intersection to the site, such additional traffic would not result in any perceptible impact on intersection operation or performance.

### 6.7.7 Off Street Parking

Whilst the proposed development involves an additional 14 employees, no additional off street parking is considered necessary. Site observations have confirmed that there is ample spare capacity within the existing on street parking supply. This is partly attributable to the fact that not all floor space approved on the site has been constructed. However the most significant factor resulting in low parking demand is the low employee density associated with the production of concrete products.

Excluding office areas, the existing building occupies a gross floor area of approximately 8690m$^2$. The RTA Guide, at Page 3-15 states the following with regard to surveyed employee density for Industry:

> *The first variable to consider is employee density. The average gross floor space per employee found in the 1978 RTA surveys was 50m$^2$ per employee. This figure is similar to survey results in two modern industrial estates in Sydney, although variations do occur. For example, within five high-tech industrial developments in Homebush, the area per employee varied from 26 to 127m$^2$, with an average of 57m$^2$.*

Subsequent to the additional 14 staff proposed as part of the current application, the business will accommodate 68 staff over 8690m$^2$ floor space (excluding office floor space) which represents an employee density of 1 employee per 127m$^2$ or two and a half times lower density than the RTA Guide surveyed average.

The site is provided with 163 parking spaces and proposes to employ only 68 staff. Clearly no additional parking is required to accommodate the proposed development.

### 6.7.8 Loading and Unloading

Loading and unloading areas

### 6.7.9 Traffic Impact Summary

The proposed development involves an increase I production output from 25,000m$^3$ to 60,000m$^3$ of concrete product, however raw material to produce ready mix can be delivered in larger trucks at a lesser frequency than ready mix concrete can be delivered. As a result, the proposed development involves 3 less incoming product deliveries during peak hour and only 1 additional outgoing delivery. Accordingly, the proposed development is likely to result in a net reduction of 1 peak hour heavy vehicle movement.

The additional 14 staff proposed as part of the expanded operations will result in approximately 7 additional peak hour passenger vehicle movements. This level of additional traffic would not result in any perceptible impact on network efficiency and operation.

The additional staffing levels will result in additional off street parking demand of approximately 7 spaces. However the existing development is significantly oversupplied with parking, having regard to the very low employee density which is typical for concrete batching and production operations. The site is provided with 163 parking spaces against the proposed employment level of 68 staff. Accordingly, no additional parking is considered necessary.

## 6.8 FUTURE LAND-USE

The subject site is currently situated in an industrial area (Zone 4(a) – General Industrial) in accordance with the Fairfield Zoning Maps (Zoning Compilation Sheet #45, Fairfield LEP 1994) with ample undeveloped lands to the west of the site and the rest with no zoning assigned at this stage. Figure 4-1 shows the location of the site within a compiled zoning map.

### 6.8.1 Impacts of the Development on Future Land-Uses

The concrete batching plant does not involve installation of infrastructure or equipment that would be difficult to be decommissioned in the future. The nature of the activities conducted on site would not have a negative impact that would restrict the future land-use of the site.

### 6.8.2 Managing the Development for Future Land-Uses

Environmental management of the proposed activities would ensure the subject site would not be "frozen" or inappropriate for future land uses. Management strategies are listed below:

- Appropriate storage and handling of raw materials and chemicals that reduces emissions to the environment, in particular to soil, water and air;
- Prevention and management measures for incidents such as major spills that ensures avoidance of incidents and proper clean up is conducted;
- Regular maintenance of all equipment to ensure proper functionality and efficiency; and
- Staff awareness and training in reducing environmental risks associated with the site's operation.

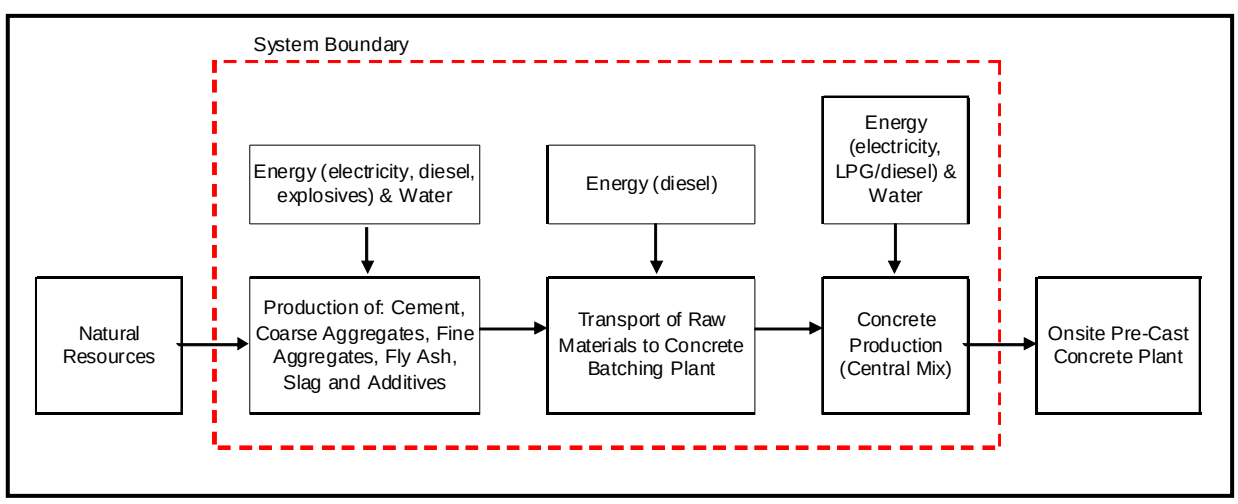
## 6.9 LIFE-CYCLE ANALYSIS

The usage of concrete particularly as construction material is significant. In 2002, about 2.7 billion $m^3$ concrete was produced worldwide and is equivalent to around 1 tonne per year per person. This made concrete as the most widely consumed man-made material and a reduction in greenhouse gas emissions in the concrete production would make a significant global impact (Naik 2008)

Concrete primarily consists of cement, water, coarse aggregates and fine aggregates. Minor ingredients that can be added include cementitious materials (e.g. fly ash and granulated blast furnish slag) and other additives to enhance the early age properties such as workability and strength development characteristics. The environmental impact per tonne of concrete produced therefore also needs to account the impacts associated with the production and acquisition of these raw materials.

Energy and greenhouse gas emissions are two of the major environmental aspects discussed in this section. The life cycle diagram for the proposed development has been described in Figure 6-6. The system boundary defines the activities involved in the proposed development which starts from the production of raw materials to the production of concrete for use in the pre-cast concrete plant.

Figure 6-6: Life Cycle Overview for the Proposed Concrete Batching Plant Operations




### 6.9.1 Energy and Greenhouse Gas Emissions

The following section describes the energy consumption and greenhouse gas emitted from each stage of the process considered above.

The amount energy and greenhouse gas depends on the design mix of the concrete. The information presented in this section is based on a study of a typical commercially-produced concrete having design specifications ranging from 20 Mpa to 60 Mpa. Note that for pre-cast mix, the design specification tends to be higher, i.e. around 50 to 60 Mpa predominately due to the higher cement content.

#### 6.9.1.1 Cement Production

Raw materials for cement production consist of a mixture minerals comprising primarily of calcium silicates, aluminates and aluminoferrites. Calcium is the element of highest concentration and this is obtained from naturally-occurring rocks such as limestone, chalk, marl and aragonite. The acquisition of these raw materials involve quarrying or mining process which includes activities such as blasting, excavation, crushing/grinding and hauling.

The raw materials are weighed and fed into a kiln (furnace) where complex chemical reactions and physical transformation occur at high temperature to produce clinkers. The next step is the clinker cooler followed by a sequence of blending and grinding that transforms clinker to finished product (cement).

Cement production is the third most energy intensive process after aluminium and steel manufacturing. For every tonne of cement produced, around 5.8 GJ of energy is consumed (Naik 2008).

The amount of energy consumed in the cement production contributes to approximately 70% of the total embodied energy per tonne of concrete. This would vary slightly depending on the amount of cement used in the concrete mix. The higher the cement content is, the higher the embodied energy of the concrete would be.

The rate of greenhouse gas emission due to cement production is approximately 0.82 tonne $CO_2$-e per tonne of concrete.

#### 6.9.1.2 Coarse and Fine Aggregates Production

The process of producing aggregates also begins with quarrying processes which involve activities such as blasting using explosives, excavating, screening, crushing and hauling. The type of rocks typically used as coarse aggregates are granite and hornfels. Fine aggregates typically consist of sands (Flower & Sanjayan 2007).

The energy of producing coarse aggregates is approximately 0.09 GJ per tonne of aggregates. The energy consumed for the production of fine aggregates is about 30 to 40% of that consumed for producing coarse aggregates (Brocklesby & Davidson 2000; Flower & Sanjayan 2007).

The process of producing aggregates contributes to about 7.5% of the total embodied energy per tonne of concrete manufactured. This equal to greenhouse emission factors of around 0.036 and 0.014 tonne $CO_2$-e per tonne of concrete for coarse and fine aggregates respectively (Nisbet et al 2000; Flower & Sanjayan 2007).

#### 6.9.1.3 Additives Production

Additives or commonly also called admixtures are often added to the concrete mixture to enhance the early age properties of concrete. The rate of usage is only about 2 L per $m^3$ of concrete or about 0.2% in volume. Due to this insignificant quantity, their contribution to the embodied energy of concrete is negligible (Flower & Sanjayan 2007).

#### 6.9.1.4 Cementitious Materials (Fly Ash and Slag) Production

Fly ash and granulated blast furnace slag (slag) are by-products of burning coal and producing steel respectively. The energy consumed in the production of these materials includes the energy used for the production, capturing, milling and refining. The approximate energy consumptions per tonne of product are 0.34 and 1.45 GJ for fly ash and slag respectively.

The addition of these materials in the concrete blend to replace part of the cement material used would reduce the embodied energy of concrete due to the significantly lower energy consumed in producing these materials compared to the cement production. It is found that replacement of cement with 25% of fly ash or 40% of slag is typical in concrete batching process. For 25% replacement of cement with fly ash, up to 15% reduction in embodied energy per tonne of concrete produced is achievable whilst when 40% of cement is replaced with slag, around 22% of reduction is possible (Flower & Sanjayan 2007). However note that replacement of cement is limited to the desired properties of the end product and therefore further investigation would be required should this be applied for the purpose of manufacturing pre-cast concrete.

#### 6.9.1.5 Transport of Raw Materials

The energy used for transporting the raw materials previously discussed would depend on the location of quarries and manufacturing plants. When conservatively assuming travel distances of 100 km for transporting cement, fly ash and slag and 50 km for aggregates, raw materials transport activities can be approximated to contribute to around 7.5% per tonne of concrete (Nisbet et al 2000).

#### 6.9.1.6 Concrete Batching Operation

The activities involved within the concrete batching plant that are relevant with the proposed development include raw material storage, weighing, mixing in a central mixer and transfer to the pre-cast concrete plant. Electricity would be the main form of energy used with the central mixers being the largest consumer of electricity.

The energy used for the concrete batching operation is approximately equal to 0.1 GJ per tonne of concrete, which is equal to around 14% contribution to the overall embodied energy per tonne of concrete. The amount of greenhouse gas produced for this activity is approximately 0.003 tonne of $CO_2$-e per tonne of concrete.

### 6.9.2 Summary

The total embodied energy from the acquisition of the raw materials up to the production of concrete ready for transfer to the pre-cast plant is approximately 1.3 GJ per tonne of concrete whilst the total rate of greenhouse gas emission is approximately 0.9 tonne of $CO_2$-e per tonne of concrete.

The proposed development itself which only consist of concrete batching operation only contributes to around 14% of the total embodied energy of the concrete product. The largest contributor is due to cement production (70%) which may be reduced by replacing some of this material with either fly ash or slag. Production of aggregates and transport are minor contributors, each contributing to around 7.5% of the total embodied energy of concrete.

Furthermore, in terms of greenhouse gas emissions, the proposed concrete batching plant would only contribute to less than 1% of the total greenhouse gas emitted. The management would implement means of reducing energy and greenhouse gas impacts by:

- Actively researching methods to reduce the consumption of non-renewable and/or energy intensive raw materials such as cement. Examples of this would be replacement of cement with fly ash or slag and incorporating recycled concrete where appropriate;

- Maintaining the functionality and efficiency of all equipment used on site; and

- Increasing staff awareness in energy efficiency and greenhouse gas reduction through training programmes.

# 7. ENVIRONMENTAL IMPACTS AND SAFEGUARDS – CUMULATIVE IMPACTS

## 7.1 CUMULATIVE IMPACTS

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (Hegmann *et al.* 1999). An assessment of cumulative effects considers the combined and incremental impacts of a proposed development with existing and future developments in mind.

There is no prescribed method to undertake a cumulative impact assessment, the approach is usually dependent on the nature and scale of the proposal. This cumulative impact assessment broadly follows the guiding principles of the "Cumulative Effects Assessment Practitioners Guide", prepared for the Canadian Environmental Assessment Agency (Hegmann et al 1999).

The proposed development is for a concrete batching plant to be adjoined to an existing precast concrete manufacturing facility, which is currently located in the Wetherill Park Industrial Estate. Wetherill Park is a suburb with one of the largest industrial estates in the southern hemisphere, with existing commercial and industrial facilities, with residential premises that are accustomed to the existing industrial and commercial environment of the suburb.

This cumulative assessment considers the local impacts on potential traffic, flora and fauna, land use, water, noise, air quality, heritage, and visual impacts associated with the proposed development and in combination with the following issues:

- Surrounding industrial developments, including Sydney Water's Filtration Plant;
- Prospect Reservoir;
- Transmission power lines easement;
- Surrounding proposed future developments; and
- The roads network associated with the area.

### 7.1.1 Methodology

Valued Ecosystem Components (VEC) were determined based on issues raised by Regulatory Authorities during the planning process and outcomes of assessments undertaken as part of the EIS. Table 7-1 presents the VEC's and the related regional issues of concern and indicators. It has been used as a guide in assisting assessment of cumulative impacts.

| Table 7-1: Valued Ecosystem Components | | |
|---|---|---|
| Environmental Component | Regional Issues of Concern | Indicators |
| Noise | Annoyance due to noise generated by the concrete batching plant equipment on site, change of vehicles entering the site | Noise levels at sensitive receptors |
| Air | Greenhouse gas emissions, dust, particulates and regional air quality | Dust and particulate concentrations at sensitive receptors, ground level concentration isopleths |
| Traffic | Increased traffic in existing road network and the ability to support this increase | Traffic volumes and noise levels |
| Water (Stormwater and Wastewater) | Contamination of stormwater run-off and off-site impacts, process water generated on site | Site layout changes, management practices, technical information on equipment and controls |
| Waste and Chemicals (No Dangerous Goods required in the process) | Potential environmental and off-site impacts associated with the generation of waste and use of chemicals on site | Waste output, waste classification, Material Safety Data Sheets |
| Firewater Containment | Containment of fire fighting water generated in the event of fire | Details of fire fighting water containment |
| Aboriginal Heritage | Potential impacts on any existing Aboriginal Heritage | Presence of Aboriginal Heritage items |
| Flora and Fauna (including Threatened Species) | Potential impacts on any existing Flora and Fauna | Presence of Flora and Fauna (including Threatened Species) |
| Visibility | Visual impacts of the proposed buildings and structures on site | Landscaping plan |

### 7.1.2 Surrounding Land Uses

The subject site is located in the north-west corner of an industrial estate, surrounded by Sydney Water's Filtration Plant to the north and unzoned land (according to with Fairfield LEP 1994 maps) to the west.

Existing land uses of the surrounding area include the following:

- North of the site – Sydney Water Filtration Plant;
- West of the site – Unzoned Land, with some land dedicated as easement to Transmission Power Lines;
- South of the site – Distribution Centre for Australian Wholesale Meats; and
- East of the site – Industrial Premise for Brunnings GARDMAN, Gardening Products.

Cumulative impacts associated with the proposed development and surrounding land uses listed above have been divided into biophysical and socio-economic impacts and presented in the following sections.

### 7.1.3 Cumulative Biophysical Impacts

#### 7.1.3.1 Noise

Operational noise is a critical environmental impact in any industrial area with surrounding residential receivers. This, in itself, should not preclude development but rather result in the development and application of management plans for these employment generating areas. The background noise levels were used in the modelling of potential environmental impacts associated with the operational and construction phases of the proposed development.

All relevant DECCW noise criteria were readily satisfied, provided that all recommended noise controls are implemented.

#### 7.1.3.2 Water

The interactions between the site (existing and proposed) and water (stormwater and process water generated on site) have been examined in this study.

Stormwater interactions with the site would remain unchanged, as the proposed concrete batching plant would be designed to segregate stormwater from areas where handling would occur. This prevents any contamination of stormwater from any raw material handling activities.

The concrete batching plant would be fully enclosed. The proposed concrete batching plant would be a "closed system" of material transfer and handling where any potential for air emissions are completely eliminated, in exception to the raw material dumping of sand and aggregate. It has been proposed as part of the concrete batching plant design to capture all rainwater that is collected within proximity to the underground hopper. All collected rainwater would be delivered to a wastewater holding tank, which would then be treated by the proposed automatic water recycling system.

Water quality impacts would be considered minimal, provided that all water impact controls and measures are implemented and maintained throughout the life of the proposed development's operations.

#### 7.1.3.3 Air

The air quality impact from the proposed development has been assessed using the latest background data (year 2007) released by DECCW from the Prospect (William Lawson Park) background air quality monitoring station. This allows the cumulative air impacts to be determined, hence assessing the cumulative impact on the community. The following were considered within the study.

- Construction phase of the development; and
- Concrete batching plant operations.

A cumulative impact between 2 biophysical aspects have been examined – which is the potential for fugitive dust emissions to cause a build-up of high alkaline substances on any surface of open areas, which are routes for stormwater flow and would then result in contamination and off-site water impacts. This has been examined in detail and it has been determined that there is no potential for this to occur, given that air and water (i.e. contaminated water and wastewater) emissions have been individually assessed and have been provided with its own respective emission controls and precautionary measures.

As discussed in Section 7.1.3.2, the proposed concrete batching plant would be fully enclosed and would be a "closed system" for transfer and handling of materials, except for the raw material dumping activity into the underground hopper. Any contaminated rainwater collected within proximity to this area would be transferred to the wastewater holding tank for treatment and re-use into the process.

The assessment showed that implementing the recommended controls would ensure all the DECCW air quality criteria are met.

#### 7.1.3.4 Waste and Chemicals

All waste generated as part of the construction and the operational phases of the proposed development would be managed in accordance with the current waste guidelines. The nature of the proposal is such that waste generated on site would be recycled as much as practicable into the process, resulting in minor quantities of waste being generated. The cumulative aspects of waste would remain to be minimal and would remain unchanged as per the existing activities on site.

Chemical stored on site, such as Adva and Daracel, would be stored up to a total capacity of 10,000 L combined. Examination of the chemicals used, the nature of use of these chemicals (which would be minor addition of these chemicals into the formulation of the ready-mix concrete), and the precautionary measures and controls utilised, show that any environmental impacts associated with the use of chemicals are considered minimal. Bulk containers of these chemicals are delivered to the site are fully enclosed and wrapped. Decanting, use and transfer of the chemical liquids would be conducted within an enclosed building and areas where this is conducted would be bunded.

Similar to the potential issue with Air Quality, the risk of stormwater contamination due to waste or chemical spills have also been considered as part of this cumulative impact assessment. Bunding proposed and the enclosure of areas where waste and chemicals are handled would be implemented, completely eliminating this potential issue.

#### 7.1.3.5 Firewater Containment

The current site has an existing fire fighting water containment, which is going to be used as the fire fighting water containment for the proposed development. It is anticipated that the existing fire fighting water containment would be sufficient to contain the fire fighting water associated with the proposed development.

#### 7.1.3.6 Flora and Fauna

No indigenous flora and fauna have been identified to be present at the location of areas affected by the construction and the operation of the proposed development. Hence, no flora and fauna study had been warranted or undertaken as part of this EIS.

It has also been identified that no flora and fauna off-site would be affected as a result of the proposed development.

### 7.1.4 Cumulative Socio-economic Impacts

#### 7.1.4.1 Traffic

A cumulative assessment relating to traffic impacts associated with the proposed development has effectively been provided within the Traffic Impact Assessment prepared by Rhodes Haskew & Associates in Section 6.7. No significant (if not, negligible) impacts are associated, given that incoming traffic to the site (predominantly truck mounted concrete trucks) are going to be replaced with raw material trucks.

#### 7.1.4.2 Land Use

The site is located in land zoned as General Industrial under the Fairfield LEP 1994, which is what the subject site is currently being used for. The proposed development for the subject site would not alter its land use and would not cause any changes to the existing socio-economic impact associated with the land use of the subject site.

#### 7.1.4.3 Visibility

Consultation with the relevant stakeholders have raised the issue of visual impacts from the proposed development, as building structures that would encapsulate storage containments, handling and material transfer areas of the activities associated with the proposed development.

Comments obtained from the initial review by Fairfield City Council's officers on the proposed landscaping plan to improve the visual amenity of the subject site as a result of the proposed development.

#### 7.1.4.4 Aboriginal Heritage

No Aboriginal heritage items were identified to be present within the location of the subject site and within the locations affected as part of the construction and operation of the proposed development. Hence, it is anticipated that there would not be any cumulative impacts regarding Aboriginal heritage as a result of the proposed development.

# 8. MITIGATION AND MANAGEMENT

## 8.1 SUMMARY OF IMPACTS

Table 8-1: Summary of Impacts

| Aspect | Potential Impact |
|---|---|
| Noise | • Project Specific Noise Levels were determined through environmental noise monitoring (logging).<br>• Noise would be generated through several activities, including concrete mixer operation, loading and transfer of raw materials, and traffic movements.<br>• Modelling different scenarios has shown noise is easily mitigated using the inherent noise control included in the design of the proposed development.<br>• Deliveries of raw material to the site have been assumed to be limited between 7AM and 6PM, to minimise noise impacts at night.<br>• Vibration and traffic noise impacts are not expected. |
| Air | • Several sources on the development site have the potential to generate dust and particulate emissions, including: raw material dumping, transfer and handling material, including conveyor belts and bin elevators; and transport movements on site.<br>• Bin elevators, conveyor belts, sand and aggregate storage bins, weigh hoppers and the mixing line would be equipped with enclosures or are carried out indoors, minimising emissions.<br>• Dust and particulate emissions can be controlled and are shown to achieve air quality criteria at nearest receptors. |
| Water | • Site activities would not likely to impact groundwater quality.<br>• No other surface water interactions are anticipated to occur except for the natural stormwater interactions, which is segregated from contamination from the processes on site<br>• Rainwater would be collected into the proposed rainwater tanks and would be segregated from areas where handling of high alkaline materials would occur. Rainwater collected would be utilised as process water.<br>• Wastewater generated on site would be collected and treated by a fully automatic water recycling system. |

Table 8-1: Summary of Impacts

| Aspect | Potential Impact |
|---|---|
| | |
| Soil and Land use | • The site is unlikely to contain acid sulphate soils according to the CSIRO's Atlas of Australasian Acid Sulfate Soils database.<br>• Construction works associated with the proposed development would be considered a small scale as the main building to house the concrete batching plant already exists. No significant impact on soil is anticipated. |
| Flora and Fauna | • There is no threatened on endangered species found on site.<br>• No flora and fauna impacts are associated with the proposed development, considering that the site location is a developed industrial premise. Only minor amount of vegetation would be cleared including grasses, weeds and shrubs. |
| Waste Generation and Management | • Waste would be generated from site activities throughout each phase of the development. Generation of these waste streams would be disposed of in a legal and appropriate manner.<br>• No hazardous waste would be generated as a result of the proposed development.<br>• Waste generated during the operation of the existing precast concrete facility is very minor, given that the nature of precast concrete products manufacturing is an "all-in, all-out" basis.<br>• Recycling activities are implemented on site including the fully-automated water recycling system to separate process wastewater from solid material, recycling of waste concrete product and general office waste recycling. |
| Health | • Potential health impacts have been identified as noise impacts and irritations caused by dust.<br>• Dust and noise emissions have been identified as minor health impacts potentially caused by the development. Both impacts are controlled by the dust and noise controls inherently incorporated into the proposed design of the proposed development. |
| Hazards and Security | • Potential hazards would include intentional, unintentional and natural hazards. These would include chemical spills, fires (bushfires or otherwise), arson, bomb threats, civil disturbances, theft, storms and flooding.<br>• Potential hazards would be controlled through security systems including fences, and also emergency response procedures developed as part of an Emergency Response Plan. |

| Table 8-1: Summary of Impacts | |
|---|---|
| **Aspect** | **Potential Impact** |
| Visual Amenity | • The development would cause some changes to the existing appearance of the site. The visual amenity of the site would be improved by shielding the raw materials silos so that it looks similar to the existing building on site. The boundary(s) that adjoins to the street accessible by public would be professionally landscaped with vegetation. Specific efforts have addressed this issue and it has been a major factor in the design of the plant |
| Heritage | • No potential impacts have been determined as a result of desktop studies. |
| Socio-Economic Environment | • Improvements in the socio-economic environment are expected with an increase in local employment. The industry would also support the local economy with a new business enterprise, injection into the economy and associated multiplier effects. |
| Road, Traffic and Transport | • Traffic volumes would increase slightly as a result of the development generating more employment however the existing traffic volumes due to the delivery of ready-mix concrete to the precast plant would reduce. The overall changes in traffic volumes are negligible.<br>• A traffic impact assessment found that there would be no adverse traffic implications. |
| Future Land Use | • Site activities would not limit the future land use potential if environmental controls discussed above are implemented. |

## 8.2 ENVIRONMENTAL CONTROLS AND MITIGATION MEASURES

Table 8-2: Environmental Controls and Mitigation Measures

| Aspect | Control or Mitigation Measures |
|---|---|
| NOISE AND VIBRATION | |
| Operational noise | Enclosures to all processing areas and equipment. |
| Truck delivery noise | Deliveries are limited to the hours between 7am and 6pm. |
| AIR | |
| Dust emissions | Dust would be primarily controlled through enclosures and dust collection system. |
| | The raw materials (sand and aggregates) are dumped to an underground bin instead of being stockpiled outdoor. This would reduce dust emissions due to wind erosion. |
| Use of vehicles and equipment | Vehicles and equipment would be maintained and used within manufacturer's specifications to reduce air emissions from machinery. |
| WATER | |
| Control surface water drainage on-site | Rainwater would be collected into rainwater tanks and would be segregated from areas where handling of high alkaline materials would occur. This is established by roofing of areas where handling of material would occur and bunding of areas where spill of materials may occur. |
| Water contamination | Chemical spills could potentially contaminate surface and groundwater. Chemical storage areas would be bunded to relevant Australian Standard. No dangerous goods would be stored on site for the proposed development. |
| Groundwater | No impact is anticipated therefore no controls are deemed required. |
| SOIL | |
| Soil Contamination | Chemical spills could also potentially contaminate soil. Chemical storage areas would be bunded to relevant Australian Standard. No dangerous goods would be stored on site for the proposed development. |
| FLORA AND FAUNA | |
| Landscaping | Landscape management would be undertaken at the site. The front 10 m verge would be heavily landscaped now that the future use of this area of the site has been proposed. |

| Table 8-2: Environmental Controls and Mitigation Measures | |
|---|---|
| Aspect | Control or Mitigation Measures |
| | |
| WASTE GENERATION AND MANAGEMENT | |
| Minimise waste, maximise resource recovery | Process waste generated is expected to be minimal. Procedure of waste management shall be regularly audited on site to identify opportunities for waste minimisation and improve production yield (i.e. minimise rejects). |
| Wastewater | Wastewater generated on site would be collected and treated by a fully automatic water recycling system. |
| Waste disposal | All waste would be segregated where possible. All waste generated on site would be disposed of in a legal and appropriate manner. |
| | On site, waste would be stored appropriately in designated waste storage areas, waste concrete from the concrete batching plant is able to be fully reused on site. |
| | Contractors would be responsible to waste generated by their activities. |
| HEALTH | |
| | Dust controls would reduce dust emissions and associated health impacts.<br>All processing areas of the proposed development would be enclosed, which achieves compliance with statutory limits. Truck deliveries are limited to the hours of 7AM and 6PM to minimise noise impacts at night. |
| | Occupational health dust sampling has been recommended during operational stage to provide a clearer assessment of health threats. |
| HAZARDS AND SECURITY | |
| | Fencing would safeguard the site against potential security threats. An Emergency Response Procedure would be prepared for control in the event of an emergency. |
| VISUAL AMENITY | |
| | The visual amenity of the site would be improved by shielding the raw materials silos so that it looks similar to the existing building on site. The boundary(s) that adjoins to the street accessible by public would be professionally landscaped with vegetation. |
| HERITAGE | |

| Table 8-2: Environmental Controls and Mitigation Measures | |
|---|---|
| Aspect | Control or Mitigation Measures |
| | Heritage items are not expected to be impacted by the development. No controls have been recommended. |
| SOCIO-ECONOMIC ENVIRONMENT | |
| | Management of the development would be undertaken to ensure sustainability of site operations and employment positions. |
| ROAD, TRAFFIC AND TRANSPORT | |
| | No significant changes in traffic volume are anticipated therefore no additional controls are required. |
| FUTURE LAND USE | |
| | Site activities would not limit the future land use potential if environmental controls discussed above are implemented. |

## 8.3 SITE MANAGEMENT PLANS

Several management plans that already exist for the precast plant and these would need to be reviewed to include the operation of the proposed concrete batching plant and its associated activities. These plans would be reviewed prior to operation commencing. A list of management plans requiring review includes the following:

- Emergency Response Plan (ERP); and
- Environmental Management Plan (EMP).

Further details of selected site management plans are provided below.

### 8.3.1 Environmental Management Plan

The proponent would have an Environmental Policy that would incorporate their commitments to environmental management of the site. The environmental policy would then form the basis of an EMP. The EMP would provide environmental procedures that incorporate the following major elements:

- Legal and Regulatory Requirements;
- Site Description including Environmental Characteristics and General Infrastructure;
- Operational Conditions and Controls;
- Environmental Management Activities in relation to particular aspects and impacts;
- Reporting, Staffing and Training Requirements; and
- Environmental Monitoring and Review.

The EMP Framework adopted would be to maximise consistency and simplicity in the administration and overriding policies, implementation and training of the EMP procedures. The specific differences then relate to the identified environmental aspects and impacts of the activities and the procedures developed to manage these impacts.

The implementation and operation element of the EMP would address the critical function of training and competency of the EMP. This would be the basis of the Environmental Management System for the site.

#### 8.3.1.1 Environmental Management Procedures

The Environmental Management Plan would consist of environmental procedures to ensure that the proponent manages their environmental interactions responsibly. Some procedures will need to be developed in line with regulatory requests.

Monitoring of water, air and noise would be carried out according to the requirements of relevant Environmental Protection legislation.

The following outlines the main procedures that would be included in the EMP:

#### 8.3.1.2 Water Management

This procedure addresses issues relating to water movement and control on site. Process wastewater generated on site would be collected and treated by a fully automatic water recycling system. Rainwater would be collected for reuse in the process. The procedure would include the operation and maintenance of the fully-automated process wastewater recycling system. The EMP would also incorporate any monitoring specified in Development Consent Conditions.

#### 8.3.1.3 Air Management

This procedure relates to controlling air emissions such as dust and particulate matters on-site to prevent degradation to the local amenity. Among other monitoring, inspections would be carried out by the proponent to ensure compliance. Potential non-conformances would be mitigated through the use of corrective and preventative actions. Corrective actions would be monitored to ensure their suitability and effectiveness.

#### 8.3.1.4 Noise Control

This procedure outlines the noise management that would be required on site in relation to proposed activities that are identified as having the potential to create noise. This procedure also indicates levels for noise compliance monitoring as part of the environmental monitoring program. A noise monitoring assessment would be carried out by an acoustic engineer, based on results recorded a suitable monitoring system would be employed. Predictive modelling of site noise has demonstrated compliance of existing design and its inherent noise controls. The effectiveness of these inherent controls will be assessed during the life of the project.

#### 8.3.1.5 Waste Management and Minimisation

This procedure outlines waste control and management on site. This procedure would be sourced from the site's detailed Waste Management Plan. Managements' procedure for diligent waste control would detail several operational measures to manage waste following the waste management hierarchy and to ensure that waste requiring disposal is done so according to the DECCW regulations. Waste minimisation and resource recovery would be practised as part of the company's commitment to the principles of Ecologically Sustainable Development.

#### 8.3.1.6 Emergency Preparedness

This procedure outlines the site's response in an emergency situation. This takes the form of the site's Emergency Response Plan (ERP). This is site-specific and is based on the various types of emergencies that may arise on site. This procedure would need to be modified to account for any future adjustments, different layout and systems the plant may require on the site.

#### 8.3.1.7 Environmental Monitoring

This procedure outlines the monitoring the proponent would undertake in its commitment to environmental protection. Monitoring of surface water, air, waste and noise would be carried out in accordance to the site's Environmental Protection Licence (EPL) and the site's EMP.

Results from regular environmental monitoring would provide regulators confidence of successful environmental management. Environmental monitoring would also provide indicators to the site operators for improved performance.

### 8.3.2 Traffic Management

This procedure outlines the operational practices for vehicle management and monitoring. Traffic control measures for plant equipment operations would be put in place. A site speed limit would also be required. Relevant records of on site traffic incidents and their evaluation would be recorded.

### 8.3.3 Landscape Management

This procedure outlines the operational practices for vegetation and landscape management and monitoring. Procedures and control measures for suitable site management would be put in place. Recommendations from site specific studies would also be implemented to achieve continual improvement in site activities. Relevant records of works conducted and their evaluation would be recorded.

### 8.3.4 Site Procedures

Other procedures that are likely to be included in the EMP are:

- Environmental Training and Awareness;
- Workplace Inspections;
- Control of Documents and Records;
- Communication;
- Complaints and Incident response;
- Corrective and Preventative Actions;
- Use of Fire Fighting Equipment;
- Internal Environmental Auditing
- Pollution Control Equipment Maintenance;
- Spill procedure;
- Receipt of raw materials; and
- Water quality monitoring.

## 8.4 STATEMENT OF COMMITMENTS

The following table summarises activities the proponent are committed to undertake to ensure environmental impacts associated with the development are minimised and appropriate rules and regulations determined by local and state governments are followed.

The statement of commitments closely follows environmental controls and mitigation measures outlined in Section 8.2 and 8.3.

Table 8-3: Statement of Commitments

| Aspect | Commitment |
|---|---|
| Noise | • Recommended noise controls and/or regular noise monitoring would be implemented to achieve project specific noise limits. |
| Air | • Dust emissions suppressed by means of enclosures and dust collection system would ensure air quality criteria are met. |
| | • Equipment that contributes to air emissions (e.g. fossil fuelled equipment) and company vehicles will be maintained on regular basis. |
| Water and Soil | • Chemicals would be stored in accordance with Australian Standards. |
| | • Staff would be trained to control chemical spills. |
| | • Housekeeping procedures will be established to ensure appropriate management of raw materials and chemicals on site. |
| | • Containment system such as bunding will be maintained on regular basis. |
| Land use | • The site will only be utilised for approved activities, which are associated with the operation of the proposed concrete batching facility and the already approved concrete precast plant. Approval from the Council and other relevant authorities will be sought should significant alteration to these facilities that will affect the land use of the site occur in the future. |
| Flora and Fauna | • No development activities shall take place outside the designated development footprint. |
| | • Commitment to protect threatened species should any be identified in the area in the future. |
| Waste Generation and Management | • Waste would be stored and disposed of legally in an appropriate manner. |
| | • A regular internal audit would be conducted to identify opportunities for waste minimisation. |
| Health | • Dust and noise mitigation measures shall be employed to mitigate potential health affects. |
| | • Dust and noise would be monitored on regular basis to ensure criteria are met. |
| Hazards and Security | • Security fencing would be constructed around the perimeter of the development and operational area. |
| | • The existing Emergency Response Plan shall be reviewed prior to proposed development operation. |
| Visual Amenity | • Landscaping will be maintained on regular basis. |
| Heritage | • Commitment to protect heritage artefacts should any be found in the future. |
| Road, Traffic and Transport | • Access points and driveways will be maintained to ensure safety for vehicle entering and exiting the site. |
| | • Traffic flow into and from the site will be managed by scheduling delivery or dispatch times. |

# 9. JUSTIFICATION AND CONCLUDING REMARKS

This section of the EIS examines the justification for the proposal and then concludes the EIS Project.

## 9.1 PROJECT JUSTIFICATION

The site is well positioned to establish principles of ecologically sustainable development.

The proposal and its potential environmental impacts have been considered in detail. Engineering controls have been inherently designed into the development to prevent environmental impacts from occurring. These have strongly influenced the siting of equipment and controls.

The proposal is considered to satisfy the precautionary principle as summarised in the following subsection.

### 9.1.1 Precautionary Principal

There are three aspects to the precautionary principal to which the proposal is evaluated.

#### 9.1.1.1 Inter-Generational Equity

In simple terms, this principal equates to the current generation given consideration to their consumption of future generation's rights to an equal share of the Earth's resources.

The current consumption of fossil fuels and the diminishing resources of oil is the most glaring example of Inter-Generational Equity.

For the proposed development, the use of the site for generating in-situ ready-mix concrete supports this principal. Minimising transport of ready-mix concrete via vehicular movement is the principle behind this.

In addition, the use of a rainwater harvesting tank and recycling of process water also supports this principle.

#### 9.1.1.2 Conservation of Biological Diversity and Ecological Integrity

No flora and fauna impacts are anticipated as a result of the proposed development. Therefore, conservation of biological diversity and ecological integrity is maintained.

#### 9.1.1.3 Improved Valuation, Pricing and Incentive Mechanisms

The relevance of this aspect is assessed against the opportunities that the proposed development provides for the business entity.

- Manufacture of in-situ ready-mix concrete allows the use of low cost raw materials that are ecologically and environmentally-friendly;
- Incentives for recycling of materials due to the first aspect; and
- Efficiency in production process by integrating the availability of raw materials (ready-mix concrete) with the production of precast concrete panels, resulting in financial consistency.

This is considered to fulfil the intent of this third aspect of the Precautionary Principle.

## 9.2 CONCLUDING REMARKS

The proposal for an in-situ concrete batching plant can, at first glance, be considered to have significant impacts on its surrounding environmental amenity and community. However, this Environmental Impact Statement has examined all environmental aspects from the proposed development via a number of environmental impact assessments, including socio-economic impacts.

Benefits that arise from this proposed development include incorporation of ecologically sustainable development factors, efficiency of the existing process and its business, and improvements to the site by raising environmental awareness as a result of the proposed development.

All stakeholders have been consulted, which includes Fairfield City Council, the Department of Environment Climate Change and Water, Department of Planning, and the nearest affected industries including Sydney Water's Water Filtration Plant at Prospect Reservoir. Suggestions from these few stakeholders were obtained and incorporated into the design of the development to ensure that environmental impacts are minimised as much as practicable.

The development as proposed is considered to be suited to this site and the request is made that approval be granted.

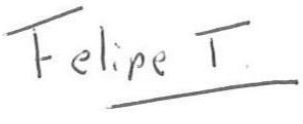
This concludes the report.

Prepared by:

Duke Ismael
Team Leader (Air Group)

Gusni Melington
Senior Environmental Engineer

Filbert Hidayat
Senior Environmental Engineer



Felipe Torres
Acoustical Engineer

Samuel Grieve
Acoustical Engineer

R T Benbow
Principal Consultant

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# ATTACHMENTS

NSW GOVERNMENT
Department of Planning

# Form A

## Request for Director-General's Requirements
for the preparation of an Environmental Impact Statement

Please provide the following information so that we can advise you promptly.

**1. Provide details of the proponent**

Proponent's name _____

Postal address 33-41 COWPASTURE ROAD

WETHERILL PARK State NSW Postcode 2164

Contact name AARON HADFIELD

Telephone (02) 9604 9444 Fax (02) 9604

ACN _____

**2. Describe the land to which the proposal relates**

No. 33-41 Street/ road COWPASTURE ROAD

Suburb/ town/ locality WETHERILL PARK

Local government area FAIRFIELD CITY COUNCIL

Real property description (e.g. lot, DP/ MPS, vol/ fol, parish, portion)

LOT 79 DP 27515

**3. Briefly describe the proposal**

Purpose ADDITION OF CONCRETE BATCHING PLANT AND MODIFICATION OF EXISTING OPERATION OF PRE-CAST CONCRETE

☐ **Yes – Copy of location map and site plan attached**

Components CONCRETE BATCHING PLANT, WATER TREATMENT PLANT

Size 50,000 $m^3$ of CONCRETE PER YEAR

Employment NO ADDITIONAL EMPLOYEE

Other (including approximate value)

MODIFICATION TO EXISTING OPERATION TO FIT THE NEW CONCRETE BATCHING PLANT AND ~~STORM~~WATER TREATMENT PLANT



NSW GOVERNMENT
Department of Planning

**4. The proposal is (tick one of the boxes)**

| | | |
|---|---|---|
| ☑ | permissible with development consent | *Go to question 5* |
| ☐ | permissible without development consent | *Go to question 8* |
| ☐ | prohibited development | *Go to question 8* |
| ☐ | project to which Part 3A of the Act applies (Major Project) | *this form should not be used and you should contact the Department* |

## DEVELOPMENT WITH CONSENT

**5. a) Which environmental planning instrument(s) (EPI) apply to the proposal?**

(ie Council local environmental plan, regional environmental plan or State environmental planning policy)

☑ LEP - FAIRFIELD LEP 1994

☐ REP - _____

☐ SEPP - _____

☐ Other - _____

**b) What is the zoning under the relevant EPI?**

INDUSTRIAL ZONE - GENERAL

**c) Who is the consent authority?**

(Note: If it is development to which Part 3A of the *Environmental Planning and Assessment Act, 1979* applies, the Minister is the approval authority, and this form should not be used)

FAIRFIELD CITY COUNCIL

**d) Is the proposal 'designated development'?**

☑ Yes ☐ No

If yes, what is the basis for designation?

(e.g. Sch. 3 of the *Environmental Planning and Assessment Regulation 2000* or an environmental planning instrument)

INTENDED PRODUCTION CAPACITY OF MORE THAN 30,000 TONNES PER YEAR

What is the category of designated development?

(e.g. extractive industry, artificial waterbody)

CONCRETE WORKS

**You should check this with the local council.**

---

**6. Is the proposal Crown development?**

| | | |
|---|---|---|
| ☑ | No | *Go to question 7* |
| ☐ | Yes. If yes, the proposal is not integrated development. | *Go to question 8* |

---

**7. Mark the relevant boxes next to the approvals which you may require in order to carry out the proposal. If any box is marked, the proposal is integrated development.**

| | | | |
|---|---|---|---|
| ☐ *Roads Act 1993* s. 138 (Council, Lands Department or RTA) | Consent to:<br>a) erect a structure or carry out a work in, on or over a public road, or<br>b) dig up or disturb the surface of a public road, or<br>c) remove or interfere with a structure, work or tree on a public road, or<br>d) pump water into a public road from any land adjoining the road, or<br>e) connect a road (whether public or private) to a classified road | ☑ *Protection of the Environment Operations Act 1997* s. 43, 47, 48, 55, 122 (DEC EPA) | Environment Protection Licence to:<br>a) authorise the carrying out of scheduled development work at any premises (scheduled development work is listed in Schedule 1 of the *POEO Regulation*<br>b) authorise the carrying out of scheduled activities at any premises (excluding an activity described as a 'waste activity' but including any activity described as 'waste facility'<br>c) control carrying out of non-scheduled activities for the purposes of regulating water |
| **Tick the relevant approval body for the Roads Act:**<br>☐ the road works affect a freeway or tollway = RTA<br>☐ the road works affect a Crown road = Lands Department<br>☐ other road works = Council<br>☐ the road works affect a classified road = Council with RTA concurrence<br>Note: If an approval is required from the Council under the Roads Act, the approval is not integrated if Council is also the consent authority | | ☐ *Rural Fires Act 1997* s. 100B (NSW Rural Fire Service) | Bushfire Safety Authority for:<br>a) The subdivision of bushfire prone land* that could lawfully be used for residential or rural residential purposes<br>b) The development of bushfire prone land* for a special fire protection purpose as defined in s. 100B of the *Rural Fires Act 1997*.<br>* bushfire prone land is identified by a 'Bushfire Prone Land Map' prepared under s.146 of the *EP&A Act*. |
| ☑ *Water Management Act 2000* s. 89, 90, 91 (DNR) | Water use approval, water management work approval or activity approval under Part 3 of Chapter 3 | ☐ *Fisheries Management Act 1994* s. 205 (DPI Fisheries) | Permit to cut, remove, damage or destroy marine vegetation on public water, land, an aquaculture lease, or on the foreshore of any such land or lease |
| ☐ *Heritage Act 1977* s. 58 (Heritage Council) | Approval in respect of the doing or carrying out of an act, matter or thing referred to in s.57(1) of the *Heritage Act 1997* | ☐ *Fisheries Management Act 1994* s. 144 (DPI Fisheries) | Aquaculture Permit |
| ☐ *Mine Subsidence Compensation Act* s. 15 (Mine Subsidence Board) | Approval to alter or erect improvements or to subdivide land within a Mine Subsidence District | ☐ *Fisheries Management Act 1994* s. 201 (DPI Fisheries) | Permit to carry out dredging or reclamation work in any waters |
| ☐ *Mining Act 1992* s. 63, 64 (DPI Minerals) | Grant of mining lease | ☐ *Fisheries Management Act 1994* s. 219 (DPI Fisheries) | Permit to:<br>a) set a net, netting or other material, or<br>b) construct or alter a dam, floodgate, causeway or weir, or<br>c) otherwise create an obstruction, across or within a bay, inlet, river or creek, or across or around a flat |
| ☐ *National Parks and Wildlife Act 1974* s. 90 (DEC NPWS) | Consent to knowingly destroy, deface or damage or knowingly cause or permit the destruction or defacement of or damage to, a relic or Aboriginal place | ☐ *Petroleum (Onshore) Act 1991* s. 9 (DPI Minerals) | Grant of production lease |

8. **In your opinion, is the proposed development a 'potentially hazardous industry' or a 'potentially offensive industry'?**

(Refer to the Department's guideline *Applying SEPP 33*)

☐ Yes ☑ No

---

**DEVELOPMENT WITHOUT CONSENT - Only answer the following question if you answered 'permissible WITHOUT development consent' in question 4.**

9. **Does the proposal include an 'activity' (as defined under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act))?**

☐ Yes ☐ No

If yes, what is the basis of this proposal being an 'activity'?

_____

_____

Name all determining authorities, as defined under section 110 of the EP&A Act.

_____

**ALL DEVELOPMENT - Provide the following information for all proposals.**

10. **Provide details of the person requesting the Director-General's requirements, if it is not the proponent**

Name BENBOW ENVIRONMENTAL

Postal address 13 DARLING STREET

NORTH PARRAMATTA State NSW Postcode 2151

Contact name DUKE ISMAEL

Telephone (02) 9890 5099 Fax (02) 9890 5399

ACN 074 404 943

---

11. **Signature of person requesting the Director-General's requirements**

Name DUKE ISMAEL

Signature _____ Date 28/6/2010

**Enquires (02) 9228 6111**

**Please post to:**
**The Director-General, Department of Planning**
**GPO Box 39, Sydney NSW 2001**
**Attention: Director, Major Development Assessment/ Major Infrastructure Assessment**

**...or fax (02) 9228 6466 / 9228 6355**

**Please do not send forms by email as they will not be accepted without a signature**

NSW GOVERNMENT | Planning

**Mining & Industry Projects**
Contact: Andrew Hartcher
Phone: 9228 6495
Fax: 9228 6466
Email: andrew.hartcher@planning.nsw.gov.au

Our ref: 10/20821

Mr Aaron Hadfield
33-41 Cowpasture Road
WETHERILL PARK NSW 2164

Dear Mr Hadfield

**Concrete Batching Plant, Wetherill Park (DGR 527)**
**Director-General's Requirements**

I refer to your application regarding the above development.

I have attached a copy of the Director-General's requirements for the Environmental Impact Statement (EIS).

In your Form A, you indicated that your proposal would require an integrated approval under the *Protection of the Environment Operations Act 1997* and the *Water Management Act 2000*. The Department has consulted with the Department of Environment, Climate Change and Water (DECCW) and the NSW Office of Water (NOW). A copy of the DECCW's requirements for your EIS is attached. Unfortunately, the NOW was unable to provide their requirements for your EIS in time thus you are advised to consult with them directly.

If other integrated approvals are identified before the Development Application (DA) is lodged, you must conduct your own consultation with the relevant agencies, and address their requirements in the EIS.

When you lodge your DA for the proposal, you must provide:

- Three (two hard and one electronic) copies of the EIS to the Department;
- A suitable number of copies of the EIS to each integrated approval authority (you should consult each agency to determine the number of copies required); and
- A cheque for $250 to each integrated approval authority, to offset costs involved in the review of the DA and EIS.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will require an additional approval under the *Commonwealth Environment Protection Biodiversity Conservation Act 1999 (EPBC Act)*. This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Department of the Environment, Water, Heritage and the Arts in Canberra (6274 1111 or www.environment.gov.au).

If you have any enquiries about these requirements, please contact Andrew Hartcher on 9228 6495.

Yours sincerely

C. Ritchie 4/11/10.

Chris Ritchie
**Manager - Industry**
**Mining & Industry Projects**
as delegate for the Director-General

# Director-General's Requirements

**Clause 73 of the *Environmental Planning and Assessment Regulation 2000***

| | |
|---|---|
| **DGR Number** | 527 |
| **Proposal** | Concrete Batching Plant, Fairfield local government area |
| **Location** | 33-41 Cowpasture Road, Wetherill Park (Lot 79 DP 27515) |
| **Applicant** | Aaron Hadfield |
| **Date of Expiry** | November 2012 |
| **General Requirements**<br>(refer Clauses 71 and 72 of the *Environmental Planning and Assessment Regulation 2000*) | The Environmental Impact Statement must include:<br>• an executive summary;<br>• a full/detailed description of the proposal, including:<br>- the need for (objectives of) the development;<br>- alternatives considered, including the consequences of not carrying out the development;<br>- the development to be carried out; and<br>- likely staging of the proposal.<br>• a risk assessment of the potential environmental impacts of the proposal, identifying the key issues for further assessment;<br>• a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above), which includes:<br>- a description of the existing environment, using sufficient baseline data;<br>- any likely interactions between the proposed operations and existing/approved development and landuse in the area;<br>- an assessment of the potential impacts of all stages of the proposal, including any cumulative impacts, taking into consideration any relevant policies, guidelines, plans and statutory provisions (see below);<br>- a description of the measures that would be implemented to avoid, minimise, mitigate and (if necessary) offset the potential impacts of the proposal, including detailed contingency plans for managing any significant risks to the environment;<br>- a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out;<br>• a compilation (in a single section of the Environmental Impact Statement) of all the proposed environmental management and monitoring measures;<br>• a detailed description of how the environmental performance of the proposal would be monitored and managed over time<br>• a conclusion justifying the development on economic, social and environmental grounds, taking into consideration whether the proposal is consistent with the objects of the *Environmental Planning & Assessment Act 1979*; and<br>• a signed declaration from the author of the Environmental Impact Statement, certifying that the information contained within the document is neither false nor misleading. |
| **Key Issues** | • **noise** - during construction, operation and traffic. This assessment must consider any potential impact on nearby private receptors;<br>• **air quality** - including odour and dust in accordance with relevant Department of Environment, Climate Change and Water guidelines. This assessment must consider any potential impacts on nearby private receptors;<br>• **soils and water** - including:<br>– impacts on surface water, stormwater management, wastewater management and flooding;<br>– details of water requirements including water supply; and<br>– the potential for soil and groundwater contamination; |

| | |
|---|---|
| | • **traffic and transport**;<br>• **hazards and risks** - in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development;<br>• **fire and incident management** - including technical information on the environmental protection equipment to be installed on the premises such as dust and noise controls, spill cleanup equipment and fire management and containment measures;<br>• **heritage** - including Aboriginal; and<br>• **flora and fauna**. |
| **Environmental Planning Instruments** | The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to:<br>• *State Environmental Planning Policy (Infrastructure) 2007;*<br>• *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development;*<br>• *Draft West Central Subregional Strategy;*<br>• *Fairfield Local Environmental Plan 1994;*<br>• *Draft Fairfield Local Environmental Plan 2010;* and<br>• relevant development control plans and section 94 plans. |
| **Guidelines** | During the preparation of the EIS, you should/must consult the Departments EIS Guideline – *Concrete Works.* The guideline is available for purchase from the Department's Information Centre, 23-33 Bridge Street, Sydney or by calling 1300 305 695. |
| **Consultation** | During the preparation of the EIS, you should/must consult the relevant Local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult surrounding landowners and occupiers that are likely to be impacted by the proposal.<br><br>Details of the consultations carried out and issues raised must be included in the EIS. |

Attachment 3:  Council Response to Pre-DA Lodgement Meeting

# FAIRFIELD CITY COUNCIL

FairfieldCity
Celebrating diversity

Administration Centre
126 Avoca Road
WAKELEY NSW 2176
Environmental Standards Fax 9757 4708

All communications addressed to:
The City Manager
P O Box 21
FAIRFIELD NSW 1860

## RECORD OF DEVELOPMENT ADVISORY MEETING OF 8 SEPTEMBER 2010

File No:

| VISITORS | COUNCIL OFFICERS | TELEPHONE No. |
|---|---|---|
| DUKE LAMAEL | NELSON MU | 9725-0313. |
| DICK [illegible] | IAN SMITH | 9725-0835. |
| TONY BARRON | STEWART KOPHAM | 9725-0805 |
| | STEPHEN RAJATHURAI | 9725-0319 |
| | | |

PROPERTY: 33-41 CowPASTURE RD, WETHERILL PARK.

SUMMARY OF PROPOSAL CONCRETE BATCHING PLANT

## MATTERS RELEVANT TO DEVELOPMENT APPLICATION

| | Required |
|---|---|
| **Owner's consent** (if Company, then state capacity of signatory) | (Yes) / No |
| **Fee** | (Yes) / No |
| **Advertising fees** | (Yes) / No |
| **Number of sets of plans** | (Yes) / No |
| **A4 set** (one only) | (Yes) / No |
| **Statement of Environmental Effects** | (Yes) / No |
| **Environmental Impact Statement** (Designated Development) ? | (Yes) / No |
| **Preliminary Hazard Analysis** (SEPP 33) | Yes / (No) |
| **Studies** (please circle) Traffic, Soil Contamination, Economic / Retail, Heritage, Flooding, Flora / Fauna, Other | |
| **On-site Detention Drainage Concept Plan** | Yes / (No) |
| **Basix Certificate** | Yes / (No) |
| **Integrated Development** – needs to check EPA Regulation. | Yes / No |

The application must be referred to the following government agencies (circled):-
A separate cheque for $ _____ in favour of **each** agency must accompany each application

RTA DEC Fisheries Heritage NPWS DOWR Waste Authority DOP

**Plans**

| | |
|---|---|
| Survey plan (levels / contours to AHD vegetation, existing structures, natural features) | (Yes) / No |
| Site plan (including location of adjoining buildings) | (Yes) / No |
| Shadow diagrams (9:00am 12 noon 3:00pm) | Yes / (No) |
| Cross and Long sections | (Yes) / No |
| Natural and finished levels | (Yes) / No |
| Landscape plan | (Yes) / No |
| Driveway grades | Yes / (No) |
| Subdivision plan | Yes / (No) |
| BasixCertificate | Yes / (No) |

**Notes to users of Development Advisory Panel**:

1. The advice and comments of Council's Officers at the development Advisory Meeting are provided on **a preliminary basis only**. Further investigation of the proposal and the site, as well as comments by other Statutory Authorities and local residents as part of the assessment of a Development Application, **may** necessitate amendments to any proposed plans of development. Furthermore, Council has the right to refuse a Development Application which is considered unsatisfactory following an assessment pursuant to Section 79C of the Environmental Planning and Assessment Act, 1979.

2. Should a further consultation on the same matter be required with Council's Development Advisory Panel in respect of the proposed development, a minimum fee of $200 would apply.

**RECORD OF COMMENTS BY COUNCIL'S DEVELOPMENT ADVISORY PANEL**

# The proposal may be defined as an Integrated Development & Designated Development under the EPA Act & EPA Regulations. These need to be addressed in the ~~Environmental~~ statement of Environmental Effects. — EIS may be reqd.
# As site is affected by a transmission line, application will be referred to Integral Energy / Transgrid for Comments.
# Location 1 away from the front setback area is the preferred location for the batch plant.
# Proposal should not affect vehicle manoeuvring on site
# Compliance with FIEP & City wide DCP 2006.
# Existing landscaping on site should be upgraded as it is very poor
# The proposed location of the batching plant along the frontage of the site that will be visible from the street is a major concern. ~~Also~~, A 10m landscape area must be provided along the frontage of the site.
# Stormwater runoff from the site needs to be addressed so as to ensure there's no pollution ~~problems~~ problems.
# Proposal may have to be licenced by DECCW.
# Noise assessment in accordance with DECCW's Industrial Noise Policy.
# Liaise with Sydney Water as the site is adjacent to Prospect Reservoir.
# Comply with BCA.

Signature of Applicant/Owner

Signature of Approvals Officer

*ATT: PETER HAMILTON (2 PAGES).
(8204 6370)

**Tony Barron**

**From:** Tony Barron
**Sent:** Wednesday, 27 October 2010 10:32 AM
**To:** 'peter.hamilton@transgrid.com.au'
**Subject:** FW: New Concrete Batching plant

Dear Peter,

At the site visit to The Sasso factory ( now Austral Precast) at No 33-41 Cowpasture Road Wetherill Park with representatives of Transgrid and Austral Bricks around April of this year; Transgrid advised that they were investigating the option to upgrade the transmission line running through the property and as a result the easement width would need to be doubled. If the easement width was increased as per the Transgrid proposal then the proposed batch plant design would infringe into the easement which would not be acceptable to Transgrid.

Austral Precast then investigated the option of moving the batch plant to the front of the factory so as it would be well clear of both the existing and proposed Transgrid easement.
On the 31 August 2010 an Email was sent to you with a layout plan Drg No 092023605 0.2 01 of the proposed batching plant for your comment and on a your follow up phone message you advised that the layout seemed to be acceptable.

Austral Precast has board approval to proceed immediately with the installation of a batching plant. Relocating the batching plant to the front of the factory requires a new Development Application ; therefore Austral Precast is seeking confirmation of the following within the next 14 days:-

- The proposed layout Drg No 092023605 0.2 01 is acceptable to Transgrid.
- Is the upgrading of the Transgrid line going to proceed and if so a timetable of the proposed upgrading program.

Best Regards,

Tony Barron

**Project Manager NSW**

**Austral Bricks Pty Ltd**

Ph: +61 2 9830 7798

Fax: +61 2 9830 7807

Mbl: 0410 422 315

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**From:** Hamilton Peter [mailto:Peter.Hamilton@transgrid.com.au]
**Sent:** Wednesday, 27 October 2010 9:51 AM
**To:** Tony Barron
**Subject:** RE: New Concrete Batching plant

Peter Hamilton I Project Manager
Projects I Capital Program Delivery I TransGrid
70-72 Commonwealth St I Surry Hills NSW 2010
Ph: 02 8204 6373 I Fax: 02 8204 6370

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**From:** Tony Barron [mailto:Tony.Barron@australbricks.com.au]
**Sent:** Tuesday, 31 August 2010 2:49 PM
**To:** Hamilton Peter
**Cc:** Paul Tolomeo
**Subject:** New Concrete Batching plant

Good afternoon Peter,

We had an onsite meeting with you and Linda Butler at our Sasso Precast factory a few months back to discuss the proposed installation of a Concrete Batching Plant.

Originally we were going to install the plant down the southern side of the existing building but now due to the over head power line easement we have decided to install it at the front of the building away from the power lines.

This is shown on the plan drawing RTH-00010130 (2) and marked possibility 2, the other drawing 092023605 0.2 01 shows the proposed layout of the plant positioned at the front of the building.

At the end of the meeting you asked for a copy of the proposed layout drawings which are attached, if you require any further information can you please let me know.

Best Regards,

Tony Barron

**Project Manager NSW**

**Austral Bricks Pty Ltd**

Ph: +61 2 9830 7798

Fax: +61 2 9830 7807

Mbl: 0410 422 315

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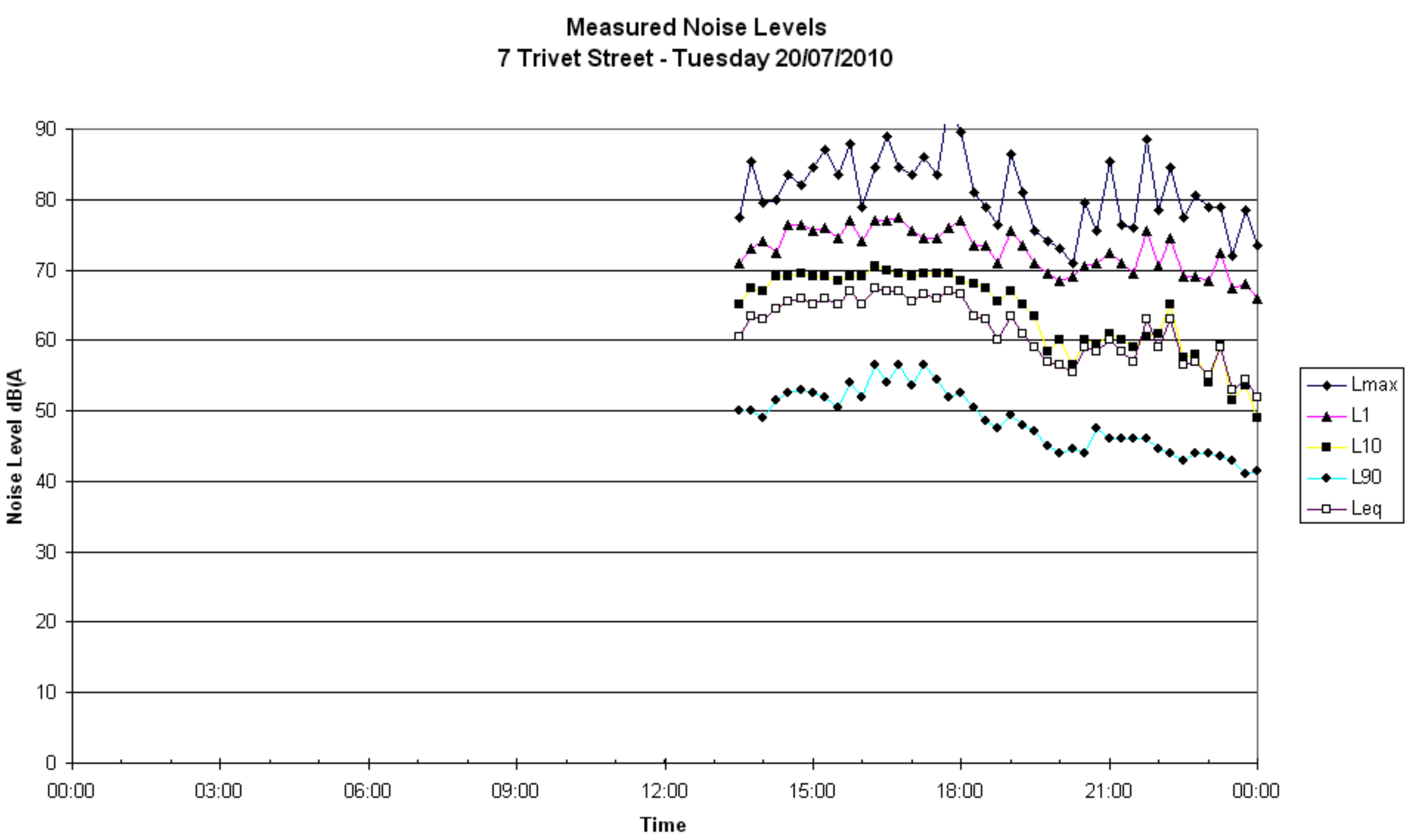
Measured Noise Levels
7 Trivet Street - Tuesday 20/07/2010
Noise Level dB(A
90
80
70
60
50
40
30
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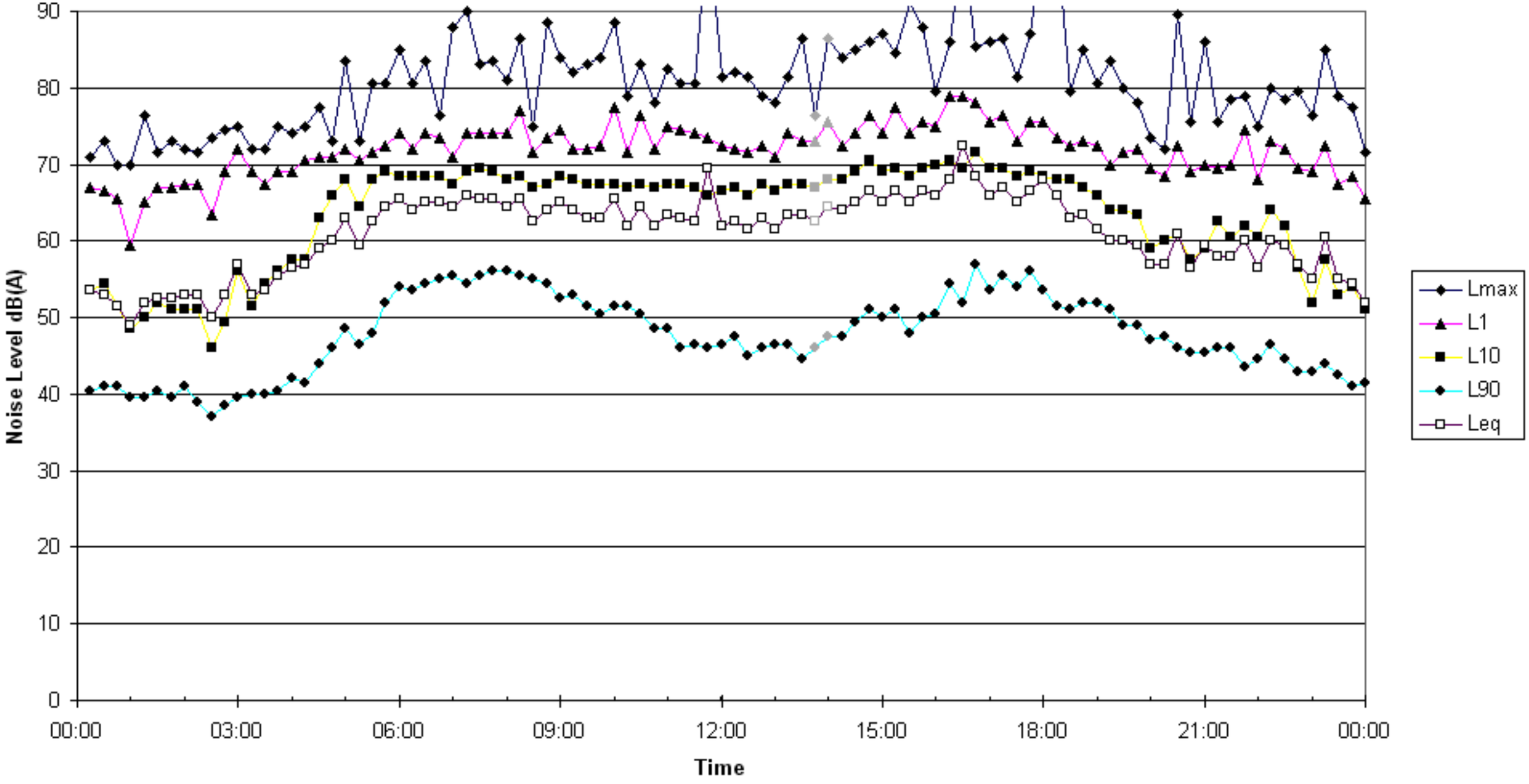
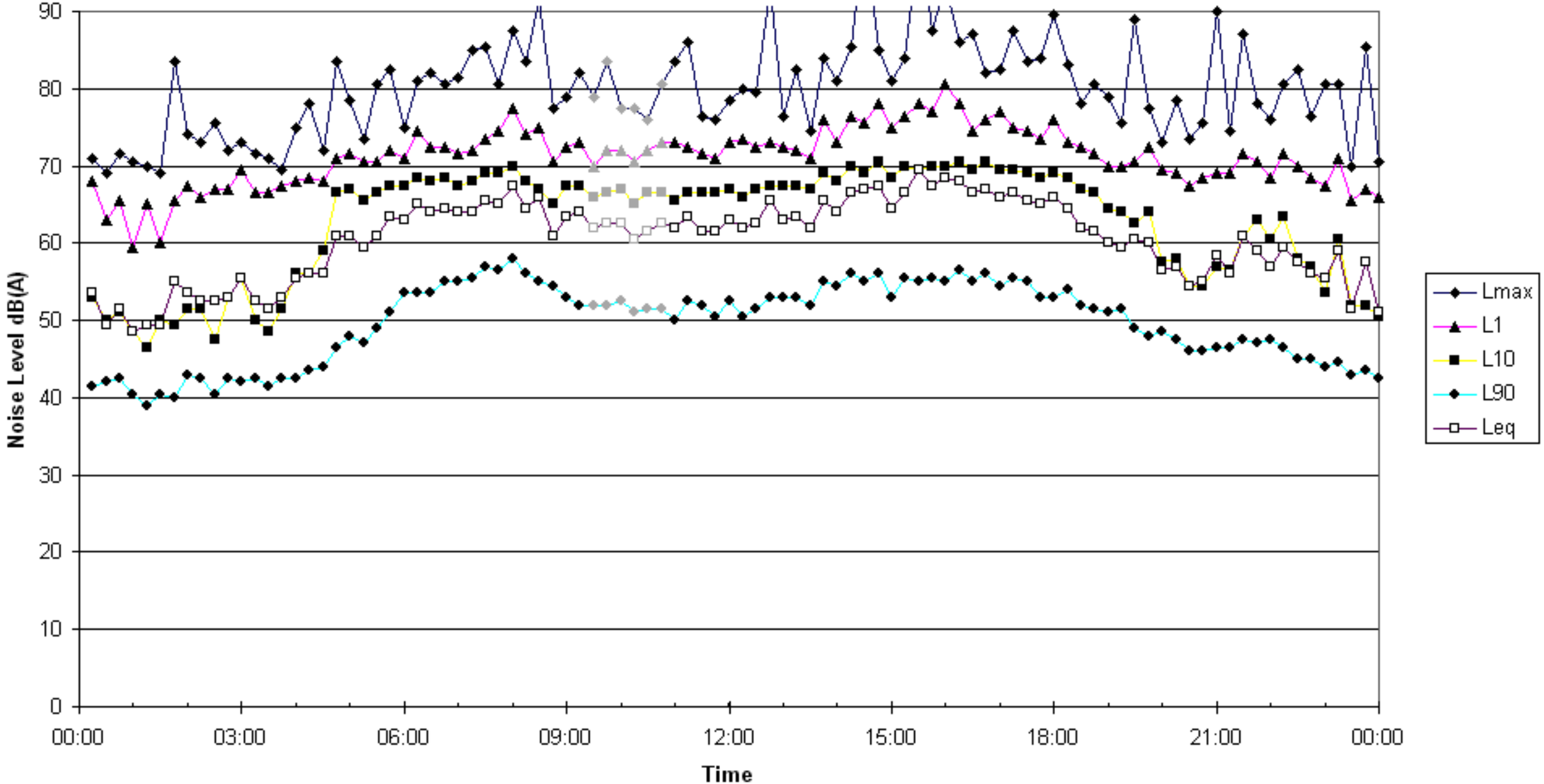
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

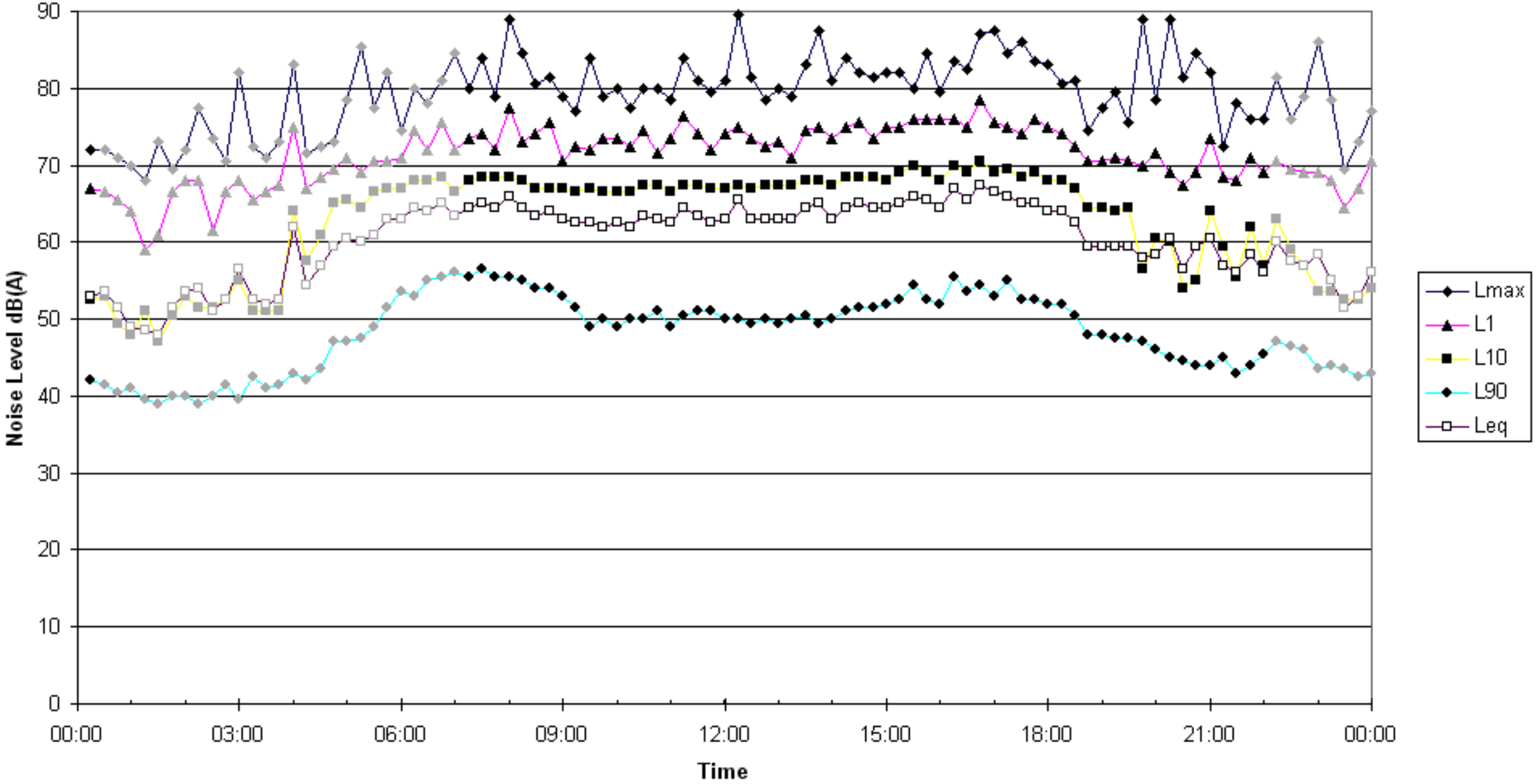
# Measured Noise Levels
## 7 Trivet Street - Wednesday 21/07/2010

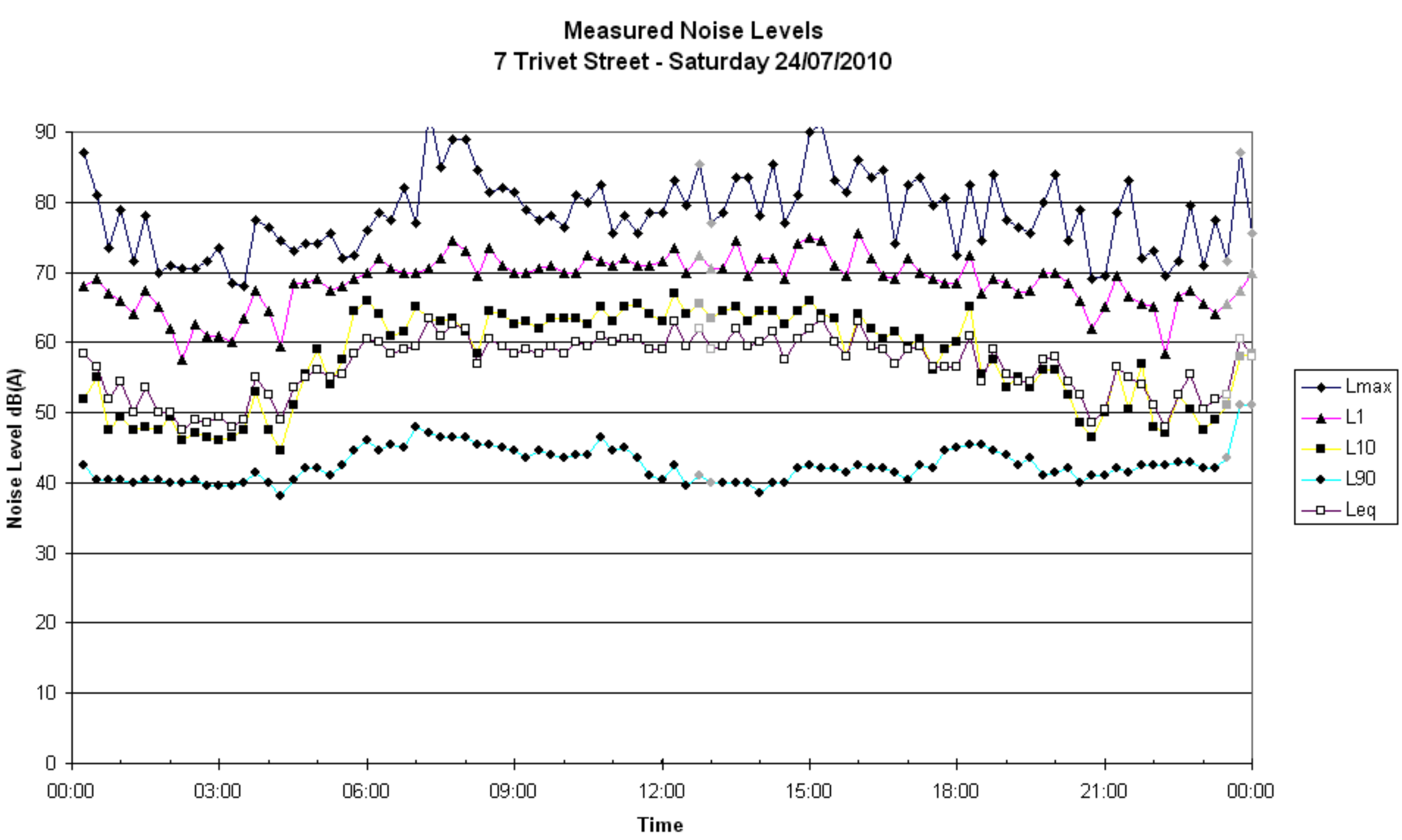


# Measured Noise Levels
## 7 Trivet Street - Thursday 22/07/2010



# Measured Noise Levels
## 7 Trivet Street - Friday 23/07/2010




Measured Noise Levels
7 Trivet Street - Saturday 24/07/2010
Noise Level dB(A)
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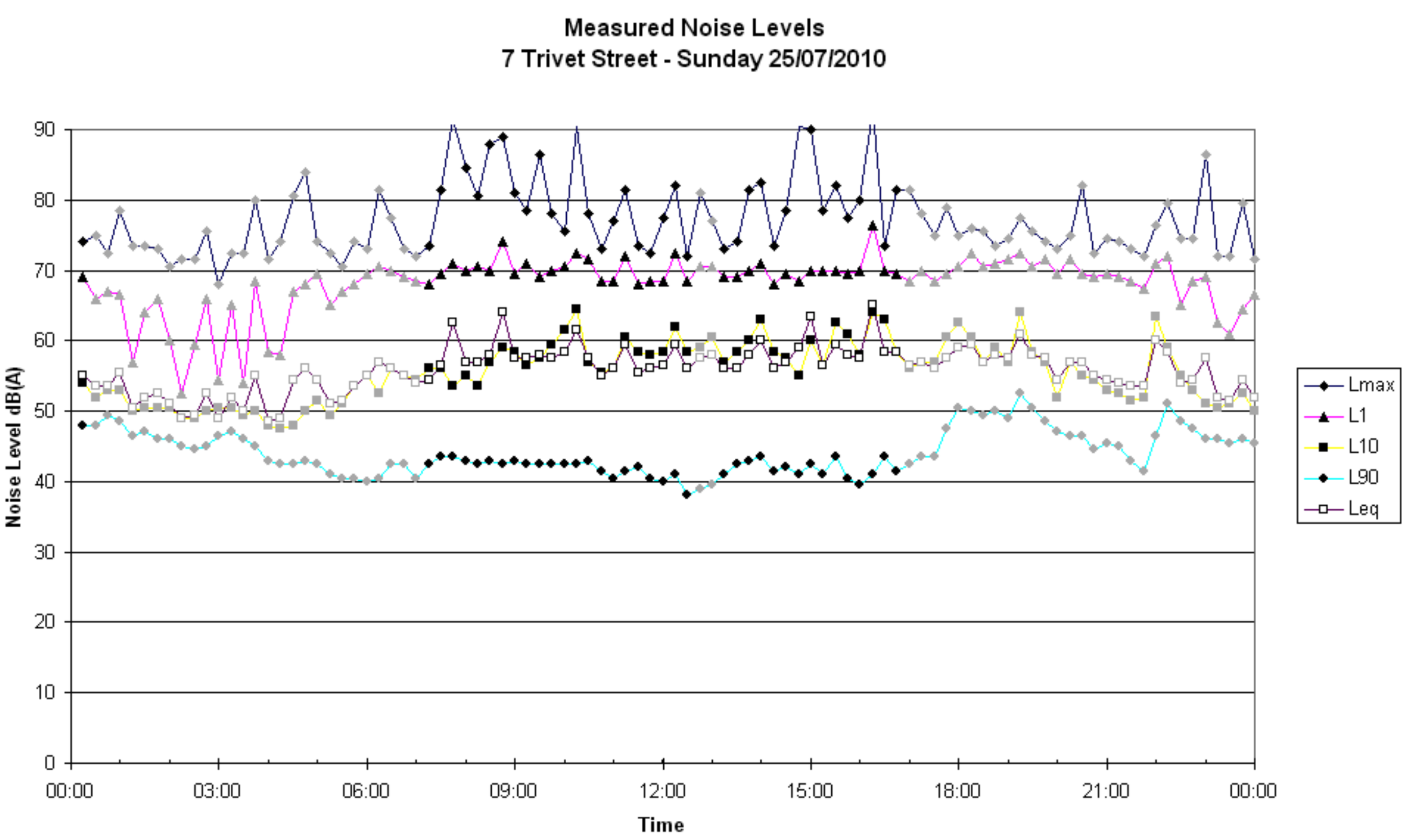
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq


Measured Noise Levels
7 Trivet Street - Sunday 25/07/2010
Noise Level dB(A)
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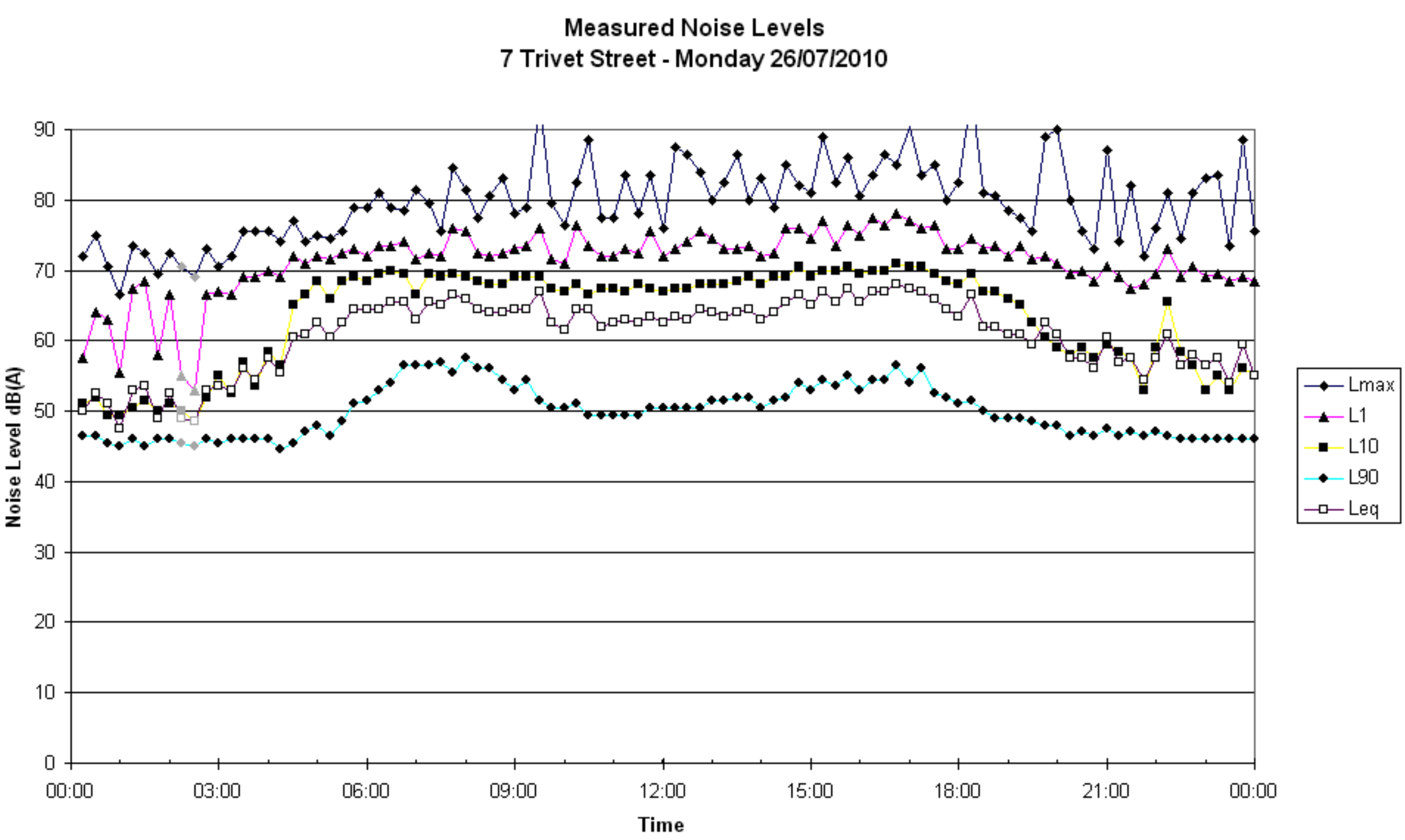
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq


Measured Noise Levels
7 Trivet Street - Monday 26/07/2010
Noise Level dB(A)
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80
70
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40
30
20
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00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
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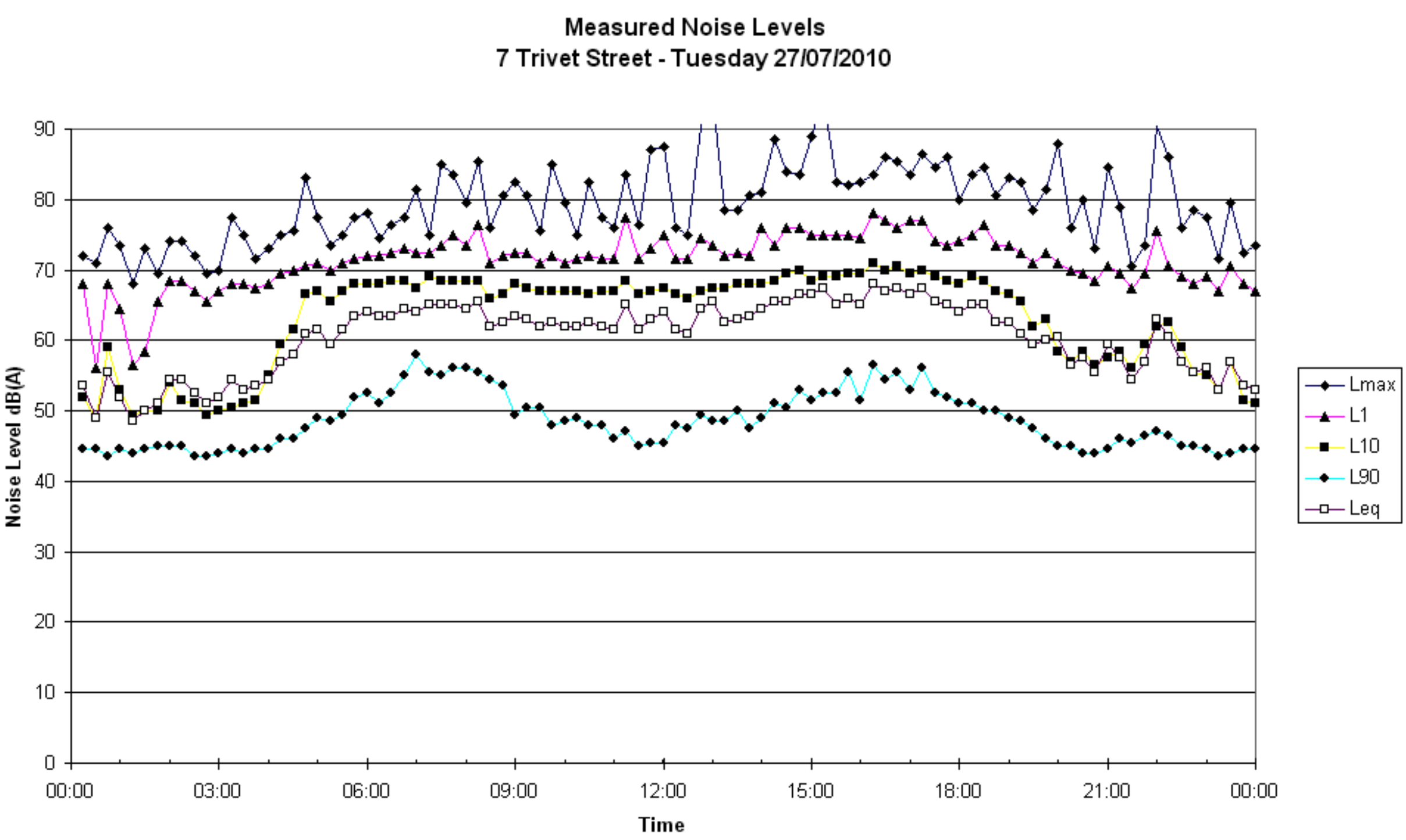
Measured Noise Levels
7 Trivet Street - Tuesday 27/07/2010
Noise Level dB(A)
90
80
70
60
50
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0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
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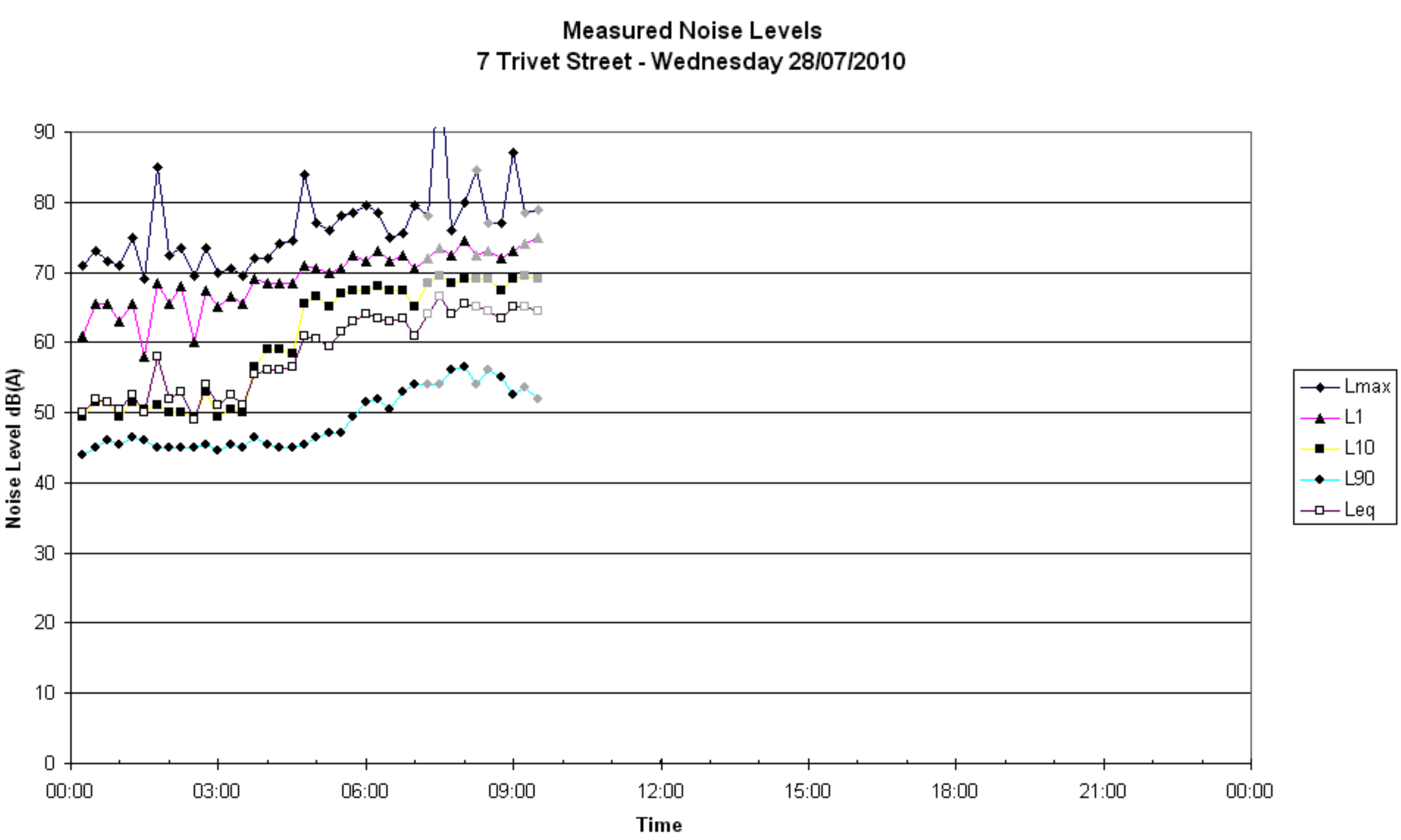
Time
Lmax
L1
L10
L90
Leq


Measured Noise Levels
7 Trivet Street - Wednesday 28/07/2010
Noise Level dB(A)
90
80
70
60
50
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0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
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L10
L90
Leq

**Acoustic Research Laboratories**
Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

# Sound Level Meter Test Report

## Report Number : 09054

**Date of Test :** 16/02/2009

**Report Issue Date :** 17/02/2009

**Equipment Tested:** **ARL Noise Logger**

**Model Number:** EL-215

**Serial Number:** 194702

**Company Name :** Benbow Environmental

13 Daking Street

North Parramatta NSW 2151

**Contact Name :** Ilco Naumoski

**Tested by :** Nicolas Larue

**Approved Signatory :**

**Ken Williams**

**Date : 17 February 2009**

NATA
WORLD RECOGNISED ACCREDITATION

Acoustic Research Laboratories Pty Ltd is NATA Accredited Laboratory Number. 14172.

This document is issued in accordance with NATA's accreditation requirements.

Accredited for compliance with ISO/IEC 17025



Level 7 ♦ Building 2 ♦ 423 Pennant Hills Rd ♦ Pennant Hills ♦ NSW 2120 ♦ AUSTRALIA
Telephone +61 2 9484 0800 ♦ Facsimile +61 2 9484 0884
www.acousticresearch.com.au

Attachment 7:  Material Safety Data Sheets for Adva and Daracel

## SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** ADVA 140 (M)
**MSDS Number:** D-06504
**Cancelled MSDS Number:** D-06078
**MSDS Date:** 03/12/2009
**Chemical Family Name:** Carboxylated Polyether
**Product Use:** Concrete Additive
**Chemical Formula:** Mixture-NA
**CAS # (Chemical Abstracts Service Number):** Mixture-NA

**Manufactured by:**

W.R.Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140

Grace Canada, Inc.
294 Clements Road West
Ajax, Ontario L1S 3C6

**In Case of Emergency Call:**

In USA: (617) 876-1400 In Canada: (905) 683-8561

## SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient | CAS# | Percent (max) |
|---|---|---|
| Ethylene oxide-Propylene oxide copolymer monobutyl ether | 009038-95-3 | 1-10 |

## SECTION 3 - HAZARDS IDENTIFICATION

**Emergency Overview:**

**Caution!**
Causes eye irritation.
Causes skin irritation.
May be harmful if ingested.

**HMIS Rating:**

| | |
|---|---|
| Health: | 1 |
| Flammability: | 1 |
| Reactivity: | 0 |
| Personal Protective Equipment: | B (See Section 8) |

**Potential Health Effects:**

**Inhalation:** Acute inhalation not expected to result in adverse effects.
Prolonged inhalation may cause respiratory tract irritation.
Effects include: No other effects expected unless listed below.
**Eye Contact:** Eye contact causes irritation.
**Skin Contact:** Skin contact causes irritation.
Prolonged skin contact can result in irritation causing redness and itching.
**Skin Absorption:** Not expected to be harmful if absorbed through the skin.
**Ingestion:** Harmful if ingested.
Effects include: Nausea, pain, vomiting, diarrhea and digestive tract irritation.

## SECTION 4 - FIRST AID MEASURES:

**Skin Contact:** Wash with soap and water.
If discomfort or irritation persists, consult a physician.
Remove contaminated clothing and wash before reuse.
**Eye Contact:** Flush eyes with water for at least 15 minutes while holding eyelids open.
If discomfort or irritation persists, consult a physician.
**Ingestion:** Do not induce vomiting.
Never give anything by mouth to an unconscious person.
If discomfort or irritation persists, consult a physician.
**Inhalation:** If symptoms develop, get fresh air. If symptoms persist, consult a physician.

If breathing has stopped, give artificial respiration then oxygen if needed.

## SECTION 5 - FIRE AND EXPLOSION HAZARD DATA

**Flash Point:** >200°F
**Flash Point Method:** Not Applicable
**Lower Explosion Limit:** Not Available
**Upper Explosion Limit:** Not Available
**Auto-Ignition Temperature:** Not Available

**NFPA Rating:**

**Health:** 1
**Flammability:** 1
**Reactivity:** 0

**Extinguishing Media:** In case of fire, use water spray, dry chemical, Carbon dioxide or foam.
**Special Fire Fighting Procedures:** Wear self-contained breathing apparatus and complete personal protective equipment when potential for exposure to vapors or products of combustion exist. Water may be used to cool containers to prevent pressure build-up and possible auto-ignition or explosion. Avoid breathing hazardous vapors or products of combustion, keep upwind. Isolate area and keep unnecessary people away. Prevent run-off from fire control or dilution from entering streams or drinking water supplies.
No special procedures specific to this product.
**Unusual Fire and Explosion Hazards:** None unless noted below.

## SECTION 6 - ACCIDENTAL RELEASE MEASURES:

**Spills/Leaks:** Use proper personal protective equipment. Do not flush to sewer or allow to enter waterways. Keep unnecessary people away.
Contain and/or absorb spill with inert material (i.e. sand, vermiculite) then place in a suitable container. For large spills, dike area and pump waste material into closed containers for disposal or reclamation.

## SECTION 7 - HANDLING AND STORAGE

**Precautionary Measures:** Avoid contact with eyes, skin and clothing.
Do not take internally.
Practice good personal hygiene to avoid ingestion.
Use only with adequate ventilation.
Wash clothing before reuse.
FOR PROFESSIONAL USE ONLY. KEEP OUT OF CHILDREN'S REACH.

## SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

### EXPOSURE GUIDELINES (US)

| Ingredient | ACGIH TLV | | | OSHA PEL | | | Other |
|---|---|---|---|---|---|---|---|
| | TWA | STEL | Ceiling | TWA | STEL | Ceiling | |
| Ethylene oxide-Propylene oxide copolymer monobutyl ether | - | - | - | - | - | | - |

### EXPOSURE GUIDELINES (CANADA)

Employers should consult local Provincial regulatory limits for exposure guidelines which may vary locally.

**Engineering Controls:** Not generally required.

**Personal Protective Equipment:**

**Respiratory Protection:** Respiratory protection is not normally required. However, a chemical cartridge respirator with organic vapor cartridge and a prefilter for dusts/mists is required at or above the applicable exposure limits (Consult above Exposure Guidelines). If no limits exist, use an approved respirator whenever a vapor or mist is generated or if respiratory irritation occurs. Supplied air respirator (SCBA) is required at exposure levels above the capabilities of a chemical cartridge respirator.
**Skin Protection:** Rubber or other impervious gloves should be worn to prevent skin contact.

**Eye Protection:** At minimum, safety glasses with side shields should be worn where exposure to excessive dust or spray is likely.
**Work/Hygienic Practices:** Use good personal hygiene practices.
None beyond those noted above.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical State:** | Liquid |
| **Appearance/Odor:** | Visual |
| **Odor Threshold:** (ppm) | Not Determined |
| **pH:** | 3.8-5.2 |
| **Vapor Pressure:** (Mm Hg) | Unknown |
| **Vapor Density:** (Air = 1) | Unknown |
| **Solubility In Water:** | Unknown |
| **Specific Gravity:** (Water = 1) | 1.010-1.120 |
| **Evaporation Rate:** (Butyl Acetate = 1) | Unknown |
| **Boiling Point:** | >212°F/100°C |
| **Viscosity:** | Unknown |
| **Bulk Density:** (Pounds/Cubic Foot)(Pcf) | Not Applicable |
| **% Volatiles (gr/L):** (70°F) (21°C) | Not Available |

## SECTION 10 - STABILITY AND REACTIVITY

| | |
|---|---|
| **Chemical Stability:** | Stable |
| **Conditions To Avoid:** | None known for this product. |
| **Hazardous Polymerization:** | Will not polymerize. |
| **Hazardous Decomposition Products:** | None known for this product. |

## SECTION 11 - TOXICOLOGICAL INFORMATION

**Ingredient(No data unless listed.)** **CAS Number** **LD50 and LC50**

**Carcinogenicity:**

| Ingredient | IARC Group 1 | IARC Group 2A | IARC Group 2B | NTP Known | NTP Suspect | OSHA |
|---|---|---|---|---|---|---|
| Ethylene oxide-Propylene oxide copolymer monobutyl ether | No | No | No | No | No | No |

| | |
|---|---|
| **Mutagenicity:** | Not applicable. |
| **Teratogenicity:** | Not applicable. |
| **Reproductive Toxicity:** | Not applicable. |

## SECTION 12 - ECOLOGICAL INFORMATION

| | |
|---|---|
| **Environmental Fate:** | No data available for product. |
| **Ecotoxicity:** | No data available for product. |

## SECTION 13 - DISPOSAL CONSIDERATIONS

**Waste Disposal Procedures:** Consult all regulations (federal, state, provincial, local) or a qualified waste disposal firm when characterizing waste for disposal. According to EPA (40 CFR § 261), waste of this product is not defined as hazardous. Dispose of waste in accordance with all applicable regulations.

## SECTION 14 - TRANSPORTATION INFORMATION

| | |
|---|---|
| **Proper Shipping Name:** | Not Applicable |
| **UN/NA Number:** | Not Applicable |
| **Domestic Hazard Class:** | Nonhazardous |
| **Surface Freight Classification:** | Not Applicable |
| **Label/Placard Required:** | Not Applicable |

## SECTION 15 - REGULATORY INFORMATION

**REGULATORY CHEMICAL LISTS:**

**CERCLA (Comprehensive Response Compensation and Liability Act):**
**(None present unless listed below)**

| Chemical Name | CAS # | Wt % | CERCLA RQ |
|---|---|---|---|

**SARA Title III (Superfund Amendments and Reauthorization Act)**

**SARA Section 312/Tier I & II Hazard Categories:**

| | |
|---|---|
| Health Immediate (acute) | Yes |
| Health Delayed (chronic) | No |
| Flammable | No |
| Reactive | No |
| Pressure | No |

**302 Reportable Ingredients (Identification Threshold 1%.):**

| Chemical Name | CAS # | Wt % | SARA 302 TPQ |
|---|---|---|---|

**313 Reportable Ingredients (Chemicals present below reporting threshold are exempt):**

| Chemical Name | CAS # | Wt % |
|---|---|---|

**National Volatile Organic Compound Emission Standards For Architectural Coatings:**

**Volatile Organic Content:** (gr/L) Not Applicable

**WHMIS Classification(s):** D2 B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR). This MSDS contains all the information required by the CPR.

**State Regulatory Information:**

**California Proposition 65:** WARNING! This product contains substances known to the state of California to cause cancer, birth defects or other reproductive harm.

**Massachusetts Hazardous Substance List(Identification threshold 0.0001%(1ppm)):**

| Chemical Name | CAS # | Wt % |
|---|---|---|

**New Jersey Hazardous Substance List(Identification threshold (0.1%)):**

| Chemical Name | CAS # | Wt % |
|---|---|---|

**Pennsylvania Hazardous Substance List(Identification threshold 0.01%):**

| Chemical Name | CAS # | Wt % |
|---|---|---|

**CHEMICAL INVENTORY STATUS**:

**All chemicals in this product are listed or exempt from listing in the following countries:**

| US | CANADA | | EUROPE | AUSTRALIA | JAPAN | KOREA | PHILIPPINES |
|---|---|---|---|---|---|---|---|
| TSCA | DSL | NDSL | EINECS/ELINCS | AICS | ENCS | ECL | PICCS |
| Yes | Yes | No | Not Determined | Not Determined | Not Determined | No | No |

**SECTION 16 - OTHER INFORMATION**

**Non-Hazardous Ingredient Disclosure:**

| Chemical Name | CAS Number |
|---|---|
| Water | 007732-18-5 |
| Polyacrylate Aqueous Solution (43-47%) | NJ801416030 |
| Sodium gluconate | 000527-07-1 |

**Prepared by:** EH&S Department
**Approved by:** EH&S Department
**Approved Date:** 03/12/2009

**Disclaimer:**

"The data included herein are presented in accordance with various environment, health and safety regulations. It is the responsibility of a recipient of the data to remain currently informed on chemical hazard information, to design and update its own program and to comply with all national, federal, state and local laws and regulations applicable to safety, occupational health, right-to-know and environmental protection."

Reference: US EPA AP 42 Appendix B.2 "*Generalized Particle Size Distributions*" (USEPA 1996)
Process: Mechanically generated
Materials: Aggregate, Unprocessed Ores

| Particle size (μm) | Cumulative Mass Percent (%)[1] |
|---|---|
| 2.5 | 15 |
| 6 | 34 |
| 10 | 51 |
| 20* | 100 |

* Estimated from PSD trend.

| Item No. | Q'ty | Description |
|---|---|---|

## *Cement Storage and Conveying*

**6.** **3** **Cement silo 64 m³ approx. 80 to - 2,9 m Ø – telescopic version**
one chamber, control opening, over-/ underpressure flap, connection flange for filter, filling pipe line NW 80 with safety coupling – approx 16 m long, breaking cone in the conical part of the silo, safety railing on silo top, mounting ladder with back railing – approx 16 meter with 2 intermediate platforms, supporting construction (1.500 mm outlet height), one base and one finishing coat.

**Including:**

**3** **Extensions of the filling pipeline by 30 m (one for each silo)**
NW 80

**3** **90-degree bends for the filling pipeline (one for each silo)**

*Material discharge height 1500 mm*

**Note:**
**In the quoted telescopic design no split silos can be supplied.**
**Prices for silos in shell-type design will follow**

**6.1** **1** **Support structure for cement silos (approx. 13,8 tons)**

**7.** **8** **Cement screw conveyors ZF 219-90**
capacity approx. 60 to/h, conveying length 9000 mm, inclination 36 °, AC gear motor unit 7,5 kW, 1 inlet, cleaning flap, connection parts to cement silo and cement weigher, hand operated cement silo shutter NW 250, connection cable and all-pole cut-off switch for electrical lock-out of cement screw conveyor in case of maintenance or repair works

**8.** **4** **Automatic over-charge safety devices for cement silos**
consisting of:
- maximum probe for installation in the cement silo
- pneumatically operated squeeze valve, with hose coupling and 3/2-way magnetic valve
- warning horn (approx. 90 dB A) as pre-warning, when reaching the maximum probe

| Item No. | Q'ty | Description |
|---|---|---|

- automatic control for filter rapping by means of proximity switch, installed in the hose coupling incl. time automatism.
- overpressure switch installed in the silo roof

For cement silo with filling pipe line NW 80

**9.** **4** **Aeration devices for cement silo**
to blow up by means of short air thrust cement piles which can form in the conical part of the cement silos. The device comprises:
the crosswise pipe line with 3 jet nozzles, solenoid valve, non return valve, pressure regulation valve, water separator and air feeding conduit to the compressor unit.

**10.** **4** **Dust collectors for cement silo**
with Polyester filter cartridges, automatic "air shock" filter cleaning, electronic control with sequence timer and automatic after shut down cleaning. Stainless steel enclosure with Polymer weather cover incl. air hose, cable and fixing bolts.

| | |
|---|---|
| Filter surface | 24 m² (260 ft²) |
| Residual cement dust in 1 m³ air | 10 mg |
| Air consumption | 4,5 Nm³/h |

**11.** **4** **Radar level indicators for cement silo**
consisting of:
- radar probe for continuous measuring, including min. and max. indication, complete with fixing parts
- indicator apparatus, measuring range 0 - 100 %

**12.** **4** **Paddle-type level indicators for max. filling level indication**
including control extension as back-up

## *Weighing Systems for liquid Admixtures:*

**13.** **1** **Admixture weighing system**

**14.** **2** **Control systems for admixture weigher**
(assumption: two-chamber weigher, max. 3 filling pumps)

**14.1** **1** **Control extension for each further admixture filling pump**

Attachment 10:  Sample AUSPLUME Input file – $PM_{10}$ Modelling Under 24 Hour and 1 Year Averaging Time

6.0 version

```
************************************************************
* WARNING - WARNING - WARNING - WARNING - WARNING - WARNING *
*                                                          *
* This is a generated file. Please do not edit it manually. *
* If  editing  is  required, under any circumstances do not *
* edit information enclosed in curly braces.  Corruption of *
* this information or changed order of data blocks enclosed *
* in curly braces may render the file unusable.             *
*                                                          *
************************************************************

Simulation Title
{110083 - Sasso Pre-Cast Concrete - SC1 - PM10 - 24 Hours}
Concentration(1)/Deposition(0), Emission rate units, Concentration/Deposition
units,Background Concentration, Variable Background flag,Variable Emission Flag
{True grams/second microgram/m3 0 False False }

Terrain influence tag, 0-ignore, 1 - include
{2}
Egan coefficients
{0.5 0.5 0.5 0.5 0.7 0.7 }
Number of source groups
{0}
Total number of sources (Stack + Area + Volume sources)
{13}

Source Group information
BPIP Run (1-True, 0-False)
{0 }
Total number of buildings
{11 }
Building name, Base elevation, Number of tiers
{B1     68 1 }
Height, Number of sides
{17.3 4 }
X coordinates
{304082 304093 304160 304150 }
Y coordinates
{6254018 6254072 6254063 6254006 }
Building name, Base elevation, Number of tiers
{B2     68 1 }
Height, Number of sides
{17.3 4 }
X coordinates
{304155 304160 304279 304275 }
Y coordinates
{6254025 6254063 6254043 6254006 }
Building name, Base elevation, Number of tiers
{B3     66 1 }
Height, Number of sides
{17.3 4 }
X coordinates
{304276 304279 304333 304328 }
Y coordinates
{6254014 6254043 6254036 6254004 }
Building name, Base elevation, Number of tiers
{B4     64 1 }
Height, Number of sides
{14.3 8 }
X coordinates
{304047 304050 304065 304070 304092 304088 304099 304097 }
Y coordinates
```

{6253920 6253937 6253932 6253968 6253961 6253929 6253927 6253912 }
Building name, Base elevation, Number of tiers
{B5 60 1 }
Height, Number of sides
{17.3 4 }
X coordinates
{304109 304117 304193 304190 }
Y coordinates
{6253913 6253944 6253928 6253901 }
Building name, Base elevation, Number of tiers
{B6 60 1 }
Height, Number of sides
{17.3 4 }
X coordinates
{304197 304204 304285 304275 }
Y coordinates
{6253911 6253964 6253954 6253898 }
Building name, Base elevation, Number of tiers
{B7 66 1 }
Height, Number of sides
{17.3 14 }
X coordinates
{303996 304006 304011 304015 304019 304020 304059 304057 304075 304074 304055 304053
304038 304037 }
Y coordinates
{6253858 6253879 6253878 6253899 6253897 6253920 6253913 6253892 6253891 6253871
6253874 6253858 6253862 6253851 }
Building name, Base elevation, Number of tiers
{B8 62 1 }
Height, Number of sides
{14.3 6 }
X coordinates
{304073 304082 304120 304113 304091 304088 }
Y coordinates
{6253856 6253909 6253903 6253865 6253867 6253856 }
Building name, Base elevation, Number of tiers
{B9 60 1 }
Height, Number of sides
{14.3 5 }
X coordinates
{304108 304120 304151 304138 304138 }
Y coordinates
{6253839 6253903 6253897 6253834 6253834 }
Building name, Base elevation, Number of tiers
{B10 59 1 }
Height, Number of sides
{14.3 6 }
X coordinates
{304158 304167 304204 304198 304183 304181 }
Y coordinates
{6253843 6253893 6253887 6253855 6253858 6253839 }
Building name, Base elevation, Number of tiers
{B11 59 1 }
Height, Number of sides
{17.3 6 }
X coordinates
{304194 304210 304253 304242 304234 304232 }
Y coordinates
{6253824 6253889 6253882 6253828 6253829 6253818 }

Source Information

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates

```
{CL1 1 304085 6254058 68 }
Stack height and diameter
{17.514 1 }
Stack temperature, Velocity, Cross, Height
{290.264 1 0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Number of particle fractions
{1 0 }
Constant emission rate
{0.0000023}

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{CL2 1 304084 6254055 68 }
Stack height and diameter
{17.514 1 }
Stack temperature, Velocity, Cross, Height
{290.264 1 0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Number of particle fractions
{1 0 }
Constant emission rate
{0.0000023}

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{CL3 1 304084 6254051 68 }
Stack height and diameter
{17.514 1 }
Stack temperature, Velocity, Cross, Height
{290.264 1 0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Number of particle fractions
{1 0 }
Constant emission rate
{0.0000023}

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{ML 1 304094 6254062 68 }
Stack height and diameter
{23.34 1 }
Stack temperature, Velocity, Cross, Height
{290.264 5.73 0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Number of particle fractions
{1 0 }
Constant emission rate
{0.0000498}

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{RMD 2 304085 6254058 68 }
Source height
{1 0 }
Source Shape
{6 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.0000006}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{0.25 0 0 0 0 20 4 }
X vertices coordinates
```

{304072 304073 304077 304076 }
Y vertices coordinates
{6254037 6254041 6254040 6254036 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{CB1 2 304085 6254058 68 }
Source height
{14.6 0 }
Source Shape
{6 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.0000028}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{0.5 0 0 0 0 20 5 }
X vertices coordinates
{304079 304084 304087 304084 304078 }
Y vertices coordinates
{6254039 6254052 6254051 6254035 6254037 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{WHL1 2 304085 6254058 68 }
Source height
{2 0 }
Source Shape
{6 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000276}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{0.5 0 0 0 0 20 4 }
X vertices coordinates
{304081 304084 304087 304084 }
Y vertices coordinates
{6254036 6254052 6254051 6254035 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{CB2 2 304085 6254058 69 }
Source height
{1 0 }
Source Shape
{6 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.0003205}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{0.25 0 0 0 0 20 8 }
X vertices coordinates
{304082 304085 304080 304081 304083 304082 304087 304084 }
Y vertices coordinates
{6254035 6254052 6254053 6254063 6254062 6254054 6254054 6254035 }

```
Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{SH 2 304085 6254058 69 }
Source height
{1 0 }
Source Shape
{6 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.0003835}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{0.25 0 0 0 0 20 4 }
X vertices coordinates
{304082 304082 304095 304094 }
Y vertices coordinates
{6254062 6254065 6254063 6254060 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{WHL2 2 304085 6254058 70 }
Source height
{11 0 }
Source Shape
{6 }
Side length, Effective Radius
{0 0 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.0000453}
SigmaZ,XSide,YSide,Angle,Radius,Number of Vertices
{1 0 0 0 0 20 4 }
X vertices coordinates
{304083 304085 304094 304094 }
Y vertices coordinates
{6254059 6254071 6254063 6254060 }

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{BESA 3 304078 6254038 68 }
Source height
{4.56 0 }
Side length, Effective Radius
{1.92 9.11 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.0000398}

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{AS1 3 304084 6254043 68 }
Source height
{3.01 0 }
Side length, Effective Radius
{4.51 6.01 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
```

Attachment 10 - Sample AUSPLUME Input File - PM10 24 Hour Averaging Period.txt
{0}

Source ID, Source Type (1 - stack, 2 - area, 3- volume) and X, Y, Z coordinates
{AS2 3 304087 6254063 69 }
Source height
{0.5 0 }
Side length, Effective Radius
{4.51 1 }
Emission type (1-constant, 2-monthly, 3-hours of the day, 4-wind and stability,
5-hour and season, 6-temperarture), Position in Array, Number of particle fractions
{1 0 }
Constant emission rate
{0.000083}

Receptor information

Discrete receptors
Receptor coordinates type (1-Cartesian,0-Polar),Number of Receptors
{1 14 }
X, Y coordinates and Elevation
{303840 6253618 0 }
X, Y coordinates and Elevation
{303815 6253792 0 }
X, Y coordinates and Elevation
{303749 6253600 0 }
X, Y coordinates and Elevation
{303758 6253569 0 }
X, Y coordinates and Elevation
{303566 6253384 0 }
X, Y coordinates and Elevation
{303711 6253275 0 }
X, Y coordinates and Elevation
{303491 6253979 0 }
X, Y coordinates and Elevation
{303381 6253945 0 }
X, Y coordinates and Elevation
{303238 6254024 0 }
X, Y coordinates and Elevation
{304641 6254325 0 }
X, Y coordinates and Elevation
{304197 6254334 0 }
X, Y coordinates and Elevation
{303694 6254264 0 }
X, Y coordinates and Elevation
{303605 6254059 0 }
X, Y coordinates and Elevation
{303511 6253831 0 }

Gridded receptors
Receptor coordinates type (1-Cartesian, 0-Polar), Number of X and Y coordinates,
Receptor height
{1 100 52 0 }

X grid coordinates
{301502 301555 301607 301660 301713 301766 301819 301872 301925 301978 302030 302083
302136 302189 302242 302295 302348 302401 302453 302506 302559 302612 302665 302718
302771 302824 302876 302929 302982 303035 303088 303141 303194 303247 303299 303352
303405 303458 303511 303564 303617 303670 303722 303775 303828 303881 303934 303987
304040 304093 304145 304198 304251 304304 304357 304410 304463 304516 304568 304621
304674 304727 304780 304833 304886 304939 304991 305044 305097 305150 305203 305256
305309 305362 305414 305467 305520 305573 305626 305679 305732 305785 305837 305890
305943 305996 306049 306102 306155 306208 306260 306313 306366 306419 306472 306525
306578 306631 306683 306736 }

Y grid coordinates
{6252697 6252750 6252802 6252855 6252907 6252960 6253012 6253065 6253117 6253170
6253222 6253275 6253327 6253380 6253432 6253485 6253537 6253590 6253642 6253695
6253747 6253800 6253852 6253905 6253957 6254010 6254062 6254115 6254167 6254220
6254272 6254325 6254377 6254430 6254482 6254535 6254587 6254640 6254692 6254745
6254797 6254850 6254902 6254955 6255007 6255060 6255112 6255165 6255217 6255270
6255322 6255375 }

Model settings and parameters
Emission conversion factor, Averaging Time
{1000000 0 }

Land use (surface roughness)
{0.8}

Averaging time flags (1,2,3,4,6,8,12,24 hrs, 7, 90 days, 3 month, All hrs
{0 0 0 0 0 0 0 1 0 0 0 0 }

Statistical output options
{0 0 }

Output options (All meteodata, Every concentration/deposition, Highest/2nd highest,
100 worst case table, Save all calculations
{0 0 0 1 0 0 }
Write concentration (1-yes, 0-no), Concentration rank, Write frequency, Frequency
Level
{1 1 0 -1 }

Disregard exponents (1-yes, 0-no), Exponent Scheme (1-Irvin urban, 2-Irvin rural,
3-ISCST, 4-User Defined
{0 1 }
Dispersion exponents
{0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.2 0.2 0.2 0.2 0.2 0.2
0.25 0.25 0.25 0.25 0.25 0.25 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.6 0.6 0.6 0.6 0.6 }

Building wake effects (1-include,0-not) , Default decay coefficient, Anemometr
height, Sigma-theta averaging period, Roughness at vane site, Smooth stability
changes, ConvectivePDF)
{1 0 10 60 0.3 0 0 }

Deposition options, Depletion options
{False False False False False False }

Stability class adjustments (0-None, 1-Urban1, 2-Urban2)
{0}
Building wake algorithms (1-Huber-Sneider, 2-Hybrid, 3-Schulman-Scire)
{4}

Gradual plume rise (1-yes,0-no), Stack tip downwash (1-yes,0-no), Disregard
Temperature Gradient (1-yes,0-no), Partial Penetration, Temp Gradient,  Adiabatic
Entrainment, Stable Entrainment
{1 1 0 0 0.004 0.6 0.6 }
Temperature Gradients for Wind and Stability categories
{0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0.02 0.02 0.02 0.02 0.02 0.02 0.035
0.035 0.035 0.035 0.035 0.035 }

Dispersion curves (1-Pasquill Gifford, 2- Briggs rural,  3-Sigma theta) horizontal <
100 m, ditto vertical < 100 m, ditto horizontal > 100 m, ditto vertical > 100 m
{3 1 2 2 }
Adjust PG curves for roughness - Horizontal, Vertical (1-yes,0-no)
{1 1 }
Enhance plume for buyoancy - Horizontal, Vertical (1-yes,0-no)

```
{1 1 }
Adjust for wind direction shear
{0}
Shear rates
{0.005 0.01 0.015 0.02 0.025 0.035 }

Wind Speed categories
{1.54 3.09 5.14 8.23 10.8 }

Output file
{'C:\Active Jobs\110083\110083 - SC1 - PM10 - 24 Hours.txt'}
Meteorological file
{'C:\Active Jobs\110083\110083 The Horsley Park - 2009.met'}
Receptor file
{'C:\Active Jobs\110083\110083 Ausplume Terrain.ter'}
Concentration file
{'C:\Active Jobs\110083\110083 - SC1 - PM10 - 24 Hours.dat'}
```

Attachment 11: Sample AUSPLUME Output file – $PM_{10}$ Modelling Under 24 Hour and 1 Year Averaging Time

110083 - Sasso Pre-Cast Concrete - SC1 - PM10 - 24 Hours

| | |
|---|---|
| Concentration or deposition | Concentration |
| Emission rate units | grams/second |
| Concentration units | microgram/m3 |
| Units conversion factor | 1.00E+06 |
| Constant background concentration | 0.00E+00 |
| Terrain effects | Egan method |
| Smooth stability class changes? | No |
| Other stability class adjustments ("urban modes") | None |
| Ignore building wake effects? | No |
| Decay coefficient (unless overridden by met. file) | 0.000 |
| Anemometer height | 10 m |
| Roughness height at the wind vane site | 0.300 m |
| Use the convective PDF algorithm? | No |
| Averaging time for sigma-theta values | 60 min. |

DISPERSION CURVES

| | |
|---|---|
| Horizontal dispersion curves for sources <100m high | Sigma-theta |
| Vertical dispersion curves for sources <100m high | Pasquill-Gifford |
| Horizontal dispersion curves for sources >100m high | Briggs Rural |
| Vertical dispersion curves for sources >100m high | Briggs Rural |
| Enhance horizontal plume spreads for buoyancy? | Yes |
| Enhance vertical plume spreads for buoyancy? | Yes |
| Adjust horizontal P-G formulae for roughness height? | Yes |
| Adjust vertical P-G formulae for roughness height? | Yes |
| Roughness height | 0.800m |
| Adjustment for wind directional shear | None |

PLUME RISE OPTIONS

| | |
|---|---|
| Gradual plume rise? | Yes |
| Stack-tip downwash included? | Yes |
| Building downwash algorithm: | PRIME method. |
| Entrainment coeff. for neutral & stable lapse rates | 0.60,0.60 |
| Partial penetration of elevated inversions? | No |
| Disregard temp. gradients in the hourly met. file? | No |

and in the absence of boundary-layer potential temperature gradients given by the hourly met. file, a value from the following table (in K/m) is used:

| Wind Speed Category | Stability Class A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.035 |
| 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.035 |
| 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.035 |
| 4 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.035 |
| 5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.035 |
| 6 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.035 |

WIND SPEED CATEGORIES
Boundaries between categories (in m/s) are: 1.54, 3.09, 5.14, 8.23, 10.80

WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

AVERAGING TIMES
24 hours

1

110083 - Sasso Pre-Cast Concrete - SC1 - PM10 - 24 Hours

SOURCE CHARACTERISTICS

STACK SOURCE: CL1

| X(m) | Y(m) | Ground Elev. | Stack Height | Diameter | Temperature | Speed |
|---|---|---|---|---|---|---|
| 304085 | 6254058 | 68m | 18m | 1.00m | 17C | 1.0m/s |

Effective building dimensions (in metres)

| Flow direction | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 100° | 110° | 120° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 69 | 76 | 83 | 86 | 87 | 86 | 82 | 75 | 66 | 58 | 69 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 58 | 69 | 78 | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 83 |
| Along-flow distance from stack | -40 | -39 | -36 | -33 | -28 | -23 | -17 | -10 | -3 | 4 | 3 | 0 |
| Across-flow distance from stack | -39 | -41 | -41 | -40 | -38 | -35 | -30 | -25 | -19 | -11 | -4 | 3 |

| Flow direction | 130° | 140° | 150° | 160° | 170° | 180° | 190° | 200° | 210° | 220° | 230° | 240° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 82 | 86 | 87 | 86 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 86 | 88 | 86 | 82 | 75 | 66 | 58 | 69 | 78 | 85 | 89 | 90 |
| Along-flow distance from stack | -3 | -6 | -8 | -11 | -13 | -14 | -18 | -30 | -42 | -52 | -61 | -68 |
| Across-flow distance from stack | 10 | 16 | 23 | 28 | 32 | 36 | 39 | 41 | 41 | 40 | 38 | 35 |

| Flow direction | 250° | 260° | 270° | 280° | 290° | 300° | 310° | 320° | 330° | 340° | 350° | 360° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 82 | 75 | 57 | 39 | 60 | 78 | 85 | 89 | 90 | 89 | 85 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 89 | 85 | 124 | 123 | 128 | 128 | 86 | 88 | 86 | 82 | 75 | 66 |
| Along-flow distance from stack | -72 | -75 | -194 | -196 | -196 | -191 | -83 | -82 | -78 | -71 | -63 | -52 |
| Across-flow distance from stack | 31 | 25 | 24 | 1 | -23 | -45 | -10 | -16 | -23 | -28 | -32 | -36 |

(Constant) emission rate = 2.30E-06 grams/second
No gravitational settling or scavenging.

STACK SOURCE: CL2

| X(m) | Y(m) | Ground Elev. | Stack Height | Diameter | Temperature | Speed |
|---|---|---|---|---|---|---|

| X(m) | Y(m) | Ground Elev. | Stack Height | Diameter | Temperature | Speed |
|---|---|---|---|---|---|---|
| 304084 | 6254055 | 68m | 18m | 1.00m | 17C | 1.0m/s |

Effective building dimensions (in metres)

| Flow direction | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 100° | 110° | 120° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 69 | 76 | 83 | 86 | 87 | 86 | 82 | 75 | 66 | 58 | 69 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 58 | 69 | 78 | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 83 |
| Along-flow distance from stack | -37 | -36 | -33 | -30 | -25 | -20 | -15 | -9 | -2 | 4 | 3 | -1 |
| Across-flow distance from stack | -39 | -41 | -41 | -39 | -37 | -33 | -28 | -22 | -16 | -8 | -1 | 6 |

| Flow direction | 130° | 140° | 150° | 160° | 170° | 180° | 190° | 200° | 210° | 220° | 230° | 240° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 82 | 86 | 87 | 86 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 86 | 88 | 86 | 82 | 75 | 66 | 58 | 69 | 78 | 85 | 89 | 90 |
| Along-flow distance from stack | -4 | -8 | -11 | -13 | -16 | -17 | -21 | -34 | -45 | -55 | -64 | -70 |
| Across-flow distance from stack | 13 | 19 | 25 | 30 | 34 | 37 | 39 | 41 | 40 | 39 | 37 | 33 |

| Flow direction | 250° | 260° | 270° | 280° | 290° | 300° | 310° | 320° | 330° | 340° | 350° | 360° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 82 | 75 | 57 | 39 | 60 | 78 | 85 | 89 | 90 | 89 | 85 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 89 | 85 | 124 | 123 | 128 | 83 | 86 | 88 | 86 | 82 | 75 | 66 |
| Along-flow distance from stack | -74 | -76 | -195 | -197 | -196 | -82 | -82 | -80 | -76 | -69 | -60 | -49 |
| Across-flow distance from stack | 28 | 23 | 21 | -3 | -26 | -6 | -13 | -19 | -25 | -30 | -34 | -37 |

(Constant) emission rate = 2.30E-06 grams/second
No gravitational settling or scavenging.

STACK SOURCE: CL3

| X(m) | Y(m) | Ground Elev. | Stack Height | Diameter | Temperature | Speed |
|---|---|---|---|---|---|---|
| 304084 | 6254051 | 68m | 18m | 1.00m | 17C | 1.0m/s |

Effective building dimensions (in metres)

| Flow direction | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 100° | 110° | 120° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 69 | 76 | 83 | 86 | 87 | 86 | 82 | 75 | 66 | 58 | 69 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 58 | 69 | 78 | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 83 |
| Along-flow distance from stack | -33 | -32 | -30 | -27 | -23 | -18 | -13 | -8 | -2 | 4 | 1 | -3 |
| Across-flow distance from stack | -38 | -39 | -39 | -37 | -34 | -29 | -24 | -18 | -12 | -4 | | |

3 10

| Flow direction | 130° | 140° | 150° | 160° | 170° | 180° | 190° | 200° | 210° | 220° | 230° | 240° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 82 | 86 | 87 | 86 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 86 | 88 | 86 | 82 | 75 | 66 | 58 | 69 | 78 | 85 | 89 | 90 |
| Along-flow distance from stack | -7 | -11 | -14 | -17 | -19 | -21 | -25 | -37 | -49 | -58 | -66 | -72 |
| Across-flow distance from stack | 16 | 21 | 27 | 31 | 35 | 37 | 38 | 39 | 38 | 37 | 34 | 29 |

| Flow direction | 250° | 260° | 270° | 280° | 290° | 300° | 310° | 320° | 330° | 340° | 350° | 360° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 82 | 75 | 57 | 39 | 60 | 78 | 85 | 89 | 90 | 89 | 85 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 89 | 85 | 124 | 123 | 128 | 83 | 86 | 88 | 86 | 82 | 75 | 66 |
| Along-flow distance from stack | -76 | -77 | -195 | -196 | -195 | -80 | -80 | -77 | -72 | -65 | -56 | -45 |
| Across-flow distance from stack | 24 | 19 | 17 | -7 | -30 | -10 | -16 | -22 | -27 | -31 | -35 | -37 |

(Constant) emission rate = 2.30E-06 grams/second
No gravitational settling or scavenging.

STACK SOURCE: ML

| X(m) | Y(m) | Ground Elev. | Stack Height | Diameter | Temperature | Speed |
|---|---|---|---|---|---|---|
| 304094 | 6254062 | 68m | 23m | 1.00m | 17C | 5.7m/s |

Effective building dimensions (in metres)

| Flow direction | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 100° | 110° | 120° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 69 | 76 | 83 | 86 | 87 | 86 | 82 | 75 | 66 | 58 | 69 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 58 | 69 | 78 | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 83 |
| Along-flow distance from stack | -46 | -46 | -44 | -42 | -38 | -32 | -27 | -20 | -12 | -4 | -4 | -6 |
| Across-flow distance from stack | -30 | -34 | -35 | -36 | -36 | -34 | -31 | -27 | -23 | -17 | -11 | -5 |

| Flow direction | 130° | 140° | 150° | 160° | 170° | 180° | 190° | 200° | 210° | 220° | 230° | 240° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 85 | 89 | 90 | 89 | 85 | 78 | 69 | 76 | 82 | 86 | 87 | 86 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 86 | 88 | 86 | 82 | 75 | 66 | 58 | 69 | 78 | 85 | 89 | 90 |
| Along-flow distance from stack | -7 | -9 | -10 | -10 | -10 | -10 | -13 | -24 | -34 | -44 | -52 | -58 |
| Across-flow distance from stack | 1 | 7 | 13 | 18 | 23 | 27 | 30 | 34 | 35 | 36 | 36 | 34 |

| Flow direction | 250° | 260° | 270° | 280° | 290° | 300° | 310° | 320° | 330° | 340° | 350° | 360° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effective building width | 82 | 75 | 57 | 39 | 60 | 78 | 85 | 89 | 90 | 89 | 85 | 78 |
| Effective building height | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Along-flow building length | 89 | 85 | 124 | 123 | 128 | 128 | 86 | 88 | 86 | 82 | 75 | 66 |
| Along-flow distance from stack | -63 | -65 | -185 | -188 | -189 | -185 | -79 | -79 | -77 | -72 | -65 | -56 |
| Across-flow distance from stack | 31 | 28 | 28 | 7 | -16 | -37 | -1 | -7 | -13 | -18 | -23 | -27 |

(Constant) emission rate = 4.98E-05 grams/second
No gravitational settling or scavenging.

INTEGRATED POLYGON AREA SOURCE: RMD

| X0(m) | Y0(m) | Ground El | No. Vertices | Ver. spread | Height |
|---|---|---|---|---|---|
| 304072 | 6254037 | 68m | 4 | 0m | 1m |

Integrated Polygon Area Source Vertice Locations (in metres)

| No. | X | Y | No. | X | Y |
|---|---|---|---|---|---|
| 1 | 304072 | 6254037 | 2 | 304073 | 6254041 |
| 3 | 304077 | 6254040 | 4 | 304076 | 6254036 |

(Constant) emission rate = 6.00E-07 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED POLYGON AREA SOURCE: CB1

| X0(m) | Y0(m) | Ground El | No. Vertices | Ver. spread | Height |
|---|---|---|---|---|---|
| 304079 | 6254039 | 68m | 5 | 1m | 15m |

Integrated Polygon Area Source Vertice Locations (in metres)

| No. | X | Y | No. | X | Y |
|---|---|---|---|---|---|
| 1 | 304079 | 6254039 | 2 | 304084 | 6254052 |
| 3 | 304087 | 6254051 | 4 | 304084 | 6254035 |
| 5 | 304078 | 6254037 | | | |

(Constant) emission rate = 2.80E-06 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED POLYGON AREA SOURCE: WHL1

| X0(m) | Y0(m) | Ground El | No. Vertices | Ver. spread | Height |
|---|---|---|---|---|---|
| 304081 | 6254036 | 68m | 4 | 1m | 2m |

Integrated Polygon Area Source Vertice Locations (in metres)

| No. | X | Y | No. | X | Y |
|---|---|---|---|---|---|
| 1 | 304081 | 6254036 | 2 | 304084 | 6254052 |
| 3 | 304087 | 6254051 | 4 | 304084 | 6254035 |

(Constant) emission rate = 2.76E-04 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED POLYGON AREA SOURCE: CB2

| X0(m) | Y0(m) | Ground El | No. Vertices | Ver. spread | Height |
|---|---|---|---|---|---|
| 304082 | 6254035 | 69m | 8 | 0m | 1m |

Integrated Polygon Area Source Vertice Locations (in metres)

| No. | X | Y | No. | X | Y |
|---|---|---|---|---|---|
| 1 | 304082 | 6254035 | 2 | 304085 | 6254052 |
| 3 | 304080 | 6254053 | 4 | 304081 | 6254063 |
| 5 | 304083 | 6254062 | 6 | 304082 | 6254054 |
| 7 | 304087 | 6254054 | 8 | 304084 | 6254035 |

(Constant) emission rate = 3.20E-04 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED POLYGON AREA SOURCE: SH

| X0(m) | Y0(m) | Ground El | No. Vertices | Ver. spread | Height |
|---|---|---|---|---|---|
| 304082 | 6254062 | 69m | 4 | 0m | 1m |

Integrated Polygon Area Source Vertice Locations (in metres)

| No. | X | Y | No. | X | Y |
|---|---|---|---|---|---|
| 1 | 304082 | 6254062 | 2 | 304082 | 6254065 |
| 3 | 304095 | 6254063 | 4 | 304094 | 6254060 |

(Constant) emission rate = 3.84E-04 grams/second per square metre
No gravitational settling or scavenging.

INTEGRATED POLYGON AREA SOURCE: WHL2

| X0(m) | Y0(m) | Ground El | No. Vertices | Ver. spread | Height |
|---|---|---|---|---|---|
| 304083 | 6254059 | 70m | 4 | 1m | 11m |

Integrated Polygon Area Source Vertice Locations (in metres)

| No. | X | Y | No. | X | Y |
|---|---|---|---|---|---|
| 1 | 304083 | 6254059 | 2 | 304085 | 6254071 |
| 3 | 304094 | 6254063 | 4 | 304094 | 6254060 |

(Constant) emission rate = 4.53E-05 grams/second per square metre
No gravitational settling or scavenging.

VOLUME SOURCE: BESA

| X(m) | Y(m) | Ground Elevation | Height | Hor. spread | Vert. spread |
|---|---|---|---|---|---|
| 304078 | 6254038 | 68m | 9m | 2m | 5m |

(Constant) emission rate = 3.98E-05 grams/second
No gravitational settling or scavenging.

VOLUME SOURCE: AS1

| X(m) | Y(m) | Ground Elevation | Height | Hor. spread | Vert. spread |
|---|---|---|---|---|---|
| 304084 | 6254043 | 68m | 6m | 5m | 3m |

(Constant) emission rate = 0.00E+00 grams/second
No gravitational settling or scavenging.

VOLUME SOURCE: AS2

| X(m) | Y(m) | Ground Elevation | Height | Hor. spread | Vert. spread |
|---|---|---|---|---|---|

304087 6254063 69m 1m 5m 1m

(Constant) emission rate = 8.30E-05 grams/second
No gravitational settling or scavenging.

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110083 - Sasso Pre-Cast Concrete - SC1 - PM10 - 24 Hours

RECEPTOR LOCATIONS

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The Cartesian receptor grid has the following x-values (or eastings):
301502.m 301555.m 301607.m 301660.m 301713.m 301766.m 301819.m
301872.m 301925.m 301978.m 302030.m 302083.m 302136.m 302189.m
302242.m 302295.m 302348.m 302401.m 302453.m 302506.m 302559.m
302612.m 302665.m 302718.m 302771.m 302824.m 302876.m 302929.m
302982.m 303035.m 303088.m 303141.m 303194.m 303247.m 303299.m
303352.m 303405.m 303458.m 303511.m 303564.m 303617.m 303670.m
303722.m 303775.m 303828.m 303881.m 303934.m 303987.m 304040.m
304093.m 304145.m 304198.m 304251.m 304304.m 304357.m 304410.m
304463.m 304516.m 304568.m 304621.m 304674.m 304727.m 304780.m
304833.m 304886.m 304939.m 304991.m 305044.m 305097.m 305150.m
305203.m 305256.m 305309.m 305362.m 305414.m 305467.m 305520.m
305573.m 305626.m 305679.m 305732.m 305785.m 305837.m 305890.m
305943.m 305996.m 306049.m 306102.m 306155.m 306208.m 306260.m
306313.m 306366.m 306419.m 306472.m 306525.m 306578.m 306631.m
306683.m 306736.m

and these y-values (or northings):
6252697.m 6252750.m 6252802.m 6252855.m 6252907.m 6252960.m 6253012.m
6253065.m 6253117.m 6253170.m 6253222.m 6253275.m 6253327.m 6253380.m
6253432.m 6253485.m 6253537.m 6253590.m 6253642.m 6253695.m 6253747.m
6253800.m 6253852.m 6253905.m 6253957.m 6254010.m 6254062.m 6254115.m
6254167.m 6254220.m 6254272.m 6254325.m 6254377.m 6254430.m 6254482.m
6254535.m 6254587.m 6254640.m 6254692.m 6254745.m 6254797.m 6254850.m
6254902.m 6254955.m 6255007.m 6255060.m 6255112.m 6255165.m 6255217.m
6255270.m 6255322.m 6255375.m

DISCRETE RECEPTOR LOCATIONS (in metres)

| No. | X | Y | ELEVN | HEIGHT | No. | X | Y | ELEVN | HEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 303840 | 6253618 | 80.0 | 0.0 | 8 | 303381 | 6253945 | 99.0 | 0.0 |
| 2 | 303815 | 6253792 | 82.0 | 0.0 | 9 | 303238 | 6254024 | 85.0 | 0.0 |
| 3 | 303749 | 6253600 | 72.0 | 0.0 | 10 | 304641 | 6254325 | 64.0 | 0.0 |
| 4 | 303758 | 6253569 | 72.0 | 0.0 | 11 | 304197 | 6254334 | 70.0 | 0.0 |
| 5 | 303566 | 6253384 | 65.0 | 0.0 | 12 | 303694 | 6254264 | 80.0 | 0.0 |
| 6 | 303711 | 6253275 | 60.0 | 0.0 | 13 | 303605 | 6254059 | 79.0 | 0.0 |
| 7 | 303491 | 6253979 | 84.0 | 0.0 | 14 | 303511 | 6253831 | 78.0 | 0.0 |

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METEOROLOGICAL DATA : The Horsley Park 2009

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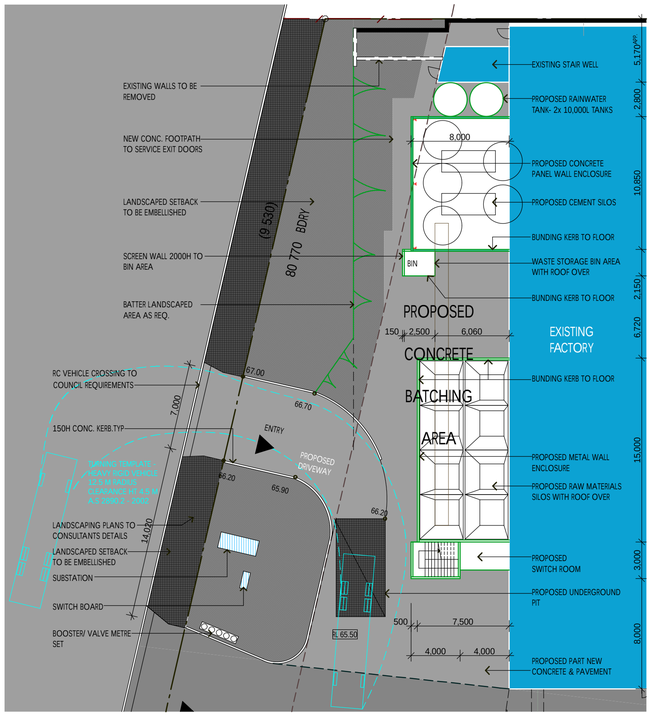
1 Peak values for the 100 worst cases (in microgram/m3)
Averaging time = 24 hours

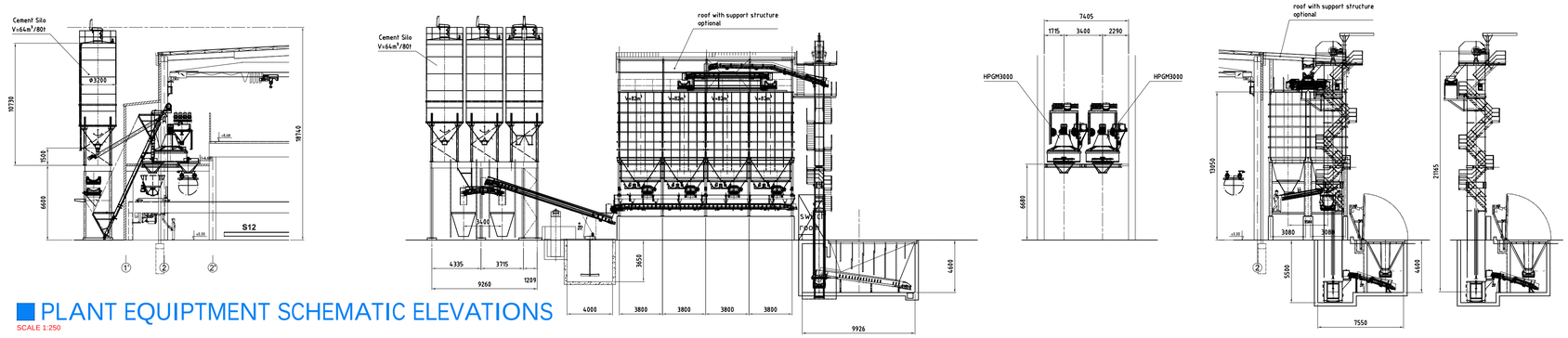
| Rank | Value | Time Recorded hour,date | Coordinates (* denotes polar) | | |
|---|---|---|---|---|---|
| 1 | 3.76E+02 | 24,14/06/09 | (304093, | 6254062, | 0.0) |
| 2 | 3.32E+02 | 24,13/05/09 | (304093, | 6254062, | 0.0) |
| 3 | 3.23E+02 | 24,06/07/09 | (304093, | 6254062, | 0.0) |
| 4 | 3.19E+02 | 24,27/05/09 | (304093, | 6254062, | 0.0) |
| 5 | 3.04E+02 | 24,07/05/09 | (304093, | 6254062, | 0.0) |
| 6 | 2.84E+02 | 24,21/08/09 | (304093, | 6254062, | 0.0) |
| 7 | 2.82E+02 | 24,27/06/09 | (304093, | 6254062, | 0.0) |
| 8 | 2.81E+02 | 24,04/05/09 | (304093, | 6254062, | 0.0) |
| 9 | 2.75E+02 | 24,15/07/09 | (304093, | 6254062, | 0.0) |
| 10 | 2.70E+02 | 24,18/07/09 | (304093, | 6254062, | 0.0) |
| 11 | 2.53E+02 | 24,26/07/09 | (304093, | 6254062, | 0.0) |
| 12 | 2.45E+02 | 24,05/06/09 | (304093, | 6254062, | 0.0) |
| 13 | 2.43E+02 | 24,10/04/09 | (304093, | 6254010, | 0.0) |
| 14 | 2.43E+02 | 24,26/12/09 | (304093, | 6254062, | 0.0) |
| 15 | 2.41E+02 | 24,27/07/09 | (304093, | 6254062, | 0.0) |
| 16 | 2.40E+02 | 24,23/06/09 | (304093, | 6254010, | 0.0) |
| 17 | 2.39E+02 | 24,07/12/09 | (304093, | 6254062, | 0.0) |
| 18 | 2.36E+02 | 24,28/07/09 | (304093, | 6254062, | 0.0) |
| 19 | 2.31E+02 | 24,12/04/09 | (304093, | 6254062, | 0.0) |
| 20 | 2.31E+02 | 24,05/08/09 | (304093, | 6254062, | 0.0) |
| 21 | 2.27E+02 | 24,13/06/09 | (304093, | 6254062, | 0.0) |
| 22 | 2.27E+02 | 24,11/04/09 | (304093, | 6254062, | 0.0) |
| 23 | 2.22E+02 | 24,09/04/09 | (304093, | 6254062, | 0.0) |
| 24 | 2.22E+02 | 24,28/03/09 | (304093, | 6254062, | 0.0) |
| 25 | 2.21E+02 | 24,24/06/09 | (304093, | 6254062, | 0.0) |
| 26 | 2.21E+02 | 24,13/03/09 | (304093, | 6254010, | 0.0) |
| 27 | 2.20E+02 | 24,28/06/09 | (304093, | 6254062, | 0.0) |
| 28 | 2.18E+02 | 24,02/06/09 | (304093, | 6254062, | 0.0) |
| 29 | 2.16E+02 | 24,05/07/09 | (304093, | 6254062, | 0.0) |
| 30 | 2.14E+02 | 24,08/04/09 | (304093, | 6254062, | 0.0) |
| 31 | 2.12E+02 | 24,04/07/09 | (304093, | 6254062, | 0.0) |
| 32 | 2.11E+02 | 24,26/05/09 | (304093, | 6254062, | 0.0) |
| 33 | 2.09E+02 | 24,15/03/09 | (304093, | 6254062, | 0.0) |
| 34 | 2.08E+02 | 24,25/07/09 | (304093, | 6254062, | 0.0) |
| 35 | 2.08E+02 | 24,04/06/09 | (304093, | 6254062, | 0.0) |
| 36 | 2.03E+02 | 24,12/05/09 | (304093, | 6254062, | 0.0) |
| 37 | 2.01E+02 | 24,03/08/09 | (304093, | 6254062, | 0.0) |
| 38 | 2.01E+02 | 24,20/06/09 | (304093, | 6254062, | 0.0) |
| 39 | 1.99E+02 | 24,30/09/09 | (304093, | 6254062, | 0.0) |
| 40 | 1.98E+02 | 24,14/03/09 | (304093, | 6254010, | 0.0) |
| 41 | 1.96E+02 | 24,10/08/09 | (304093, | 6254062, | 0.0) |
| 42 | 1.96E+02 | 24,08/07/09 | (304093, | 6254062, | 0.0) |
| 43 | 1.96E+02 | 24,20/07/09 | (304093, | 6254062, | 0.0) |
| 44 | 1.95E+02 | 24,25/06/09 | (304093, | 6254062, | 0.0) |
| 45 | 1.94E+02 | 24,14/08/09 | (304093, | 6254062, | 0.0) |
| 46 | 1.94E+02 | 24,17/05/09 | (304093, | 6254062, | 0.0) |
| 47 | 1.92E+02 | 24,01/08/09 | (304093, | 6254062, | 0.0) |
| 48 | 1.87E+02 | 24,28/02/09 | (304093, | 6254010, | 0.0) |
| 49 | 1.86E+02 | 24,02/09/09 | (304093, | 6254062, | 0.0) |
| 50 | 1.86E+02 | 24,17/06/09 | (304093, | 6254062, | 0.0) |
| 51 | 1.83E+02 | 24,31/07/09 | (304093, | 6254062, | 0.0) |
| 52 | 1.83E+02 | 24,04/08/09 | (304093, | 6254062, | 0.0) |
| 53 | 1.83E+02 | 24,27/12/09 | (304093, | 6254062, | 0.0) |
| 54 | 1.81E+02 | 24,21/10/09 | (304093, | 6254062, | 0.0) |
| 55 | 1.81E+02 | 24,25/05/09 | (304093, | 6254062, | 0.0) |
| 56 | 1.81E+02 | 24,10/09/09 | (304093, | 6254062, | 0.0) |
| 57 | 1.81E+02 | 24,21/03/09 | (304093, | 6254062, | 0.0) |
| 58 | 1.80E+02 | 24,15/04/09 | (304093, | 6254062, | 0.0) |
| 59 | 1.76E+02 | 24,09/08/09 | (304093, | 6254062, | 0.0) |

| | | | | |
|---|---|---|---|---|
| 60 | 1.76E+02 | 24,17/03/09 | (304093, 6254062, | 0.0) |
| 61 | 1.76E+02 | 24,11/06/09 | (304093, 6254062, | 0.0) |
| 62 | 1.74E+02 | 24,07/10/09 | (304093, 6254062, | 0.0) |
| 63 | 1.71E+02 | 24,30/04/09 | (304093, 6254062, | 0.0) |
| 64 | 1.70E+02 | 24,22/06/09 | (304093, 6254062, | 0.0) |
| 65 | 1.70E+02 | 24,12/06/09 | (304093, 6254062, | 0.0) |
| 66 | 1.69E+02 | 24,19/07/09 | (304093, 6254010, | 0.0) |
| 67 | 1.69E+02 | 24,11/02/09 | (304093, 6254062, | 0.0) |
| 68 | 1.66E+02 | 24,12/01/09 | (304093, 6254062, | 0.0) |
| 69 | 1.66E+02 | 24,14/04/09 | (304093, 6254062, | 0.0) |
| 70 | 1.64E+02 | 24,05/10/09 | (304093, 6254062, | 0.0) |
| 71 | 1.63E+02 | 24,09/09/09 | (304093, 6254062, | 0.0) |
| 72 | 1.62E+02 | 24,01/05/09 | (304093, 6254062, | 0.0) |
| 73 | 1.62E+02 | 24,09/07/09 | (304093, 6254062, | 0.0) |
| 74 | 1.61E+02 | 24,04/03/09 | (304093, 6254062, | 0.0) |
| 75 | 1.61E+02 | 24,09/05/09 | (304093, 6254062, | 0.0) |
| 76 | 1.60E+02 | 24,06/03/09 | (304093, 6254062, | 0.0) |
| 77 | 1.60E+02 | 24,11/07/09 | (304093, 6254062, | 0.0) |
| 78 | 1.58E+02 | 24,29/07/09 | (304093, 6254062, | 0.0) |
| 79 | 1.58E+02 | 24,16/10/09 | (304093, 6254062, | 0.0) |
| 80 | 1.57E+02 | 24,19/08/09 | (304093, 6254062, | 0.0) |
| 81 | 1.56E+02 | 24,20/08/09 | (304093, 6254062, | 0.0) |
| 82 | 1.51E+02 | 24,10/06/09 | (304093, 6254062, | 0.0) |
| 83 | 1.51E+02 | 24,11/09/09 | (304093, 6254062, | 0.0) |
| 84 | 1.50E+02 | 24,05/03/09 | (304093, 6254062, | 0.0) |
| 85 | 1.50E+02 | 24,08/09/09 | (304093, 6254062, | 0.0) |
| 86 | 1.50E+02 | 24,19/11/09 | (304093, 6254010, | 0.0) |
| 87 | 1.50E+02 | 24,29/09/09 | (304093, 6254062, | 0.0) |
| 88 | 1.49E+02 | 24,14/07/09 | (304093, 6254062, | 0.0) |
| 89 | 1.49E+02 | 24,17/04/09 | (304093, 6254062, | 0.0) |
| 90 | 1.48E+02 | 24,05/09/09 | (304093, 6254062, | 0.0) |
| 91 | 1.48E+02 | 24,29/05/09 | (304093, 6254062, | 0.0) |
| 92 | 1.47E+02 | 24,29/04/09 | (304093, 6254062, | 0.0) |
| 93 | 1.46E+02 | 24,26/06/09 | (304093, 6254062, | 0.0) |
| 94 | 1.43E+02 | 24,10/02/09 | (304093, 6254062, | 0.0) |
| 95 | 1.43E+02 | 24,05/04/09 | (304093, 6254062, | 0.0) |
| 96 | 1.42E+02 | 24,19/06/09 | (304093, 6254062, | 0.0) |
| 97 | 1.39E+02 | 24,29/03/09 | (304093, 6254062, | 0.0) |
| 98 | 1.36E+02 | 24,21/06/09 | (304093, 6254010, | 0.0) |
| 99 | 1.36E+02 | 24,27/04/09 | (304093, 6254062, | 0.0) |
| 100 | 1.36E+02 | 24,28/09/09 | (304093, 6254062, | 0.0) |



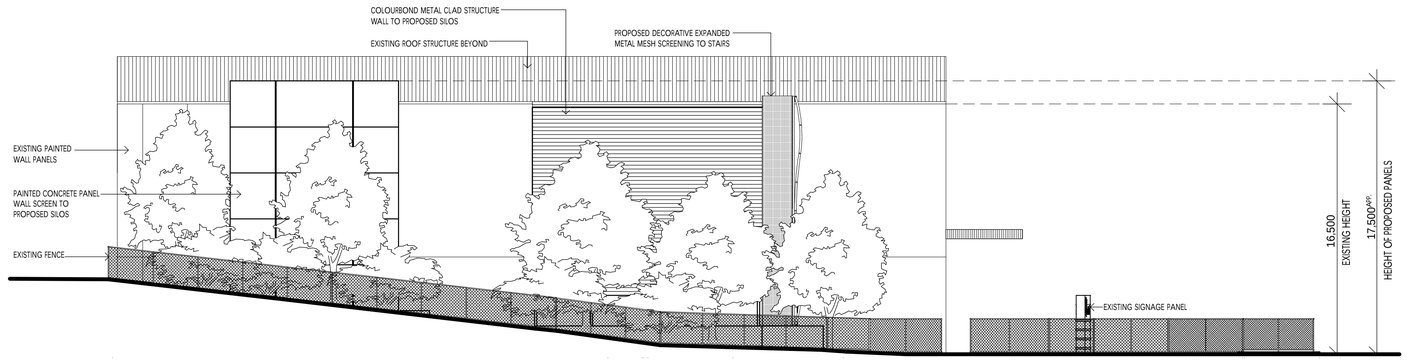

## GROUND FLOOR PLAN

SCALE 1:250



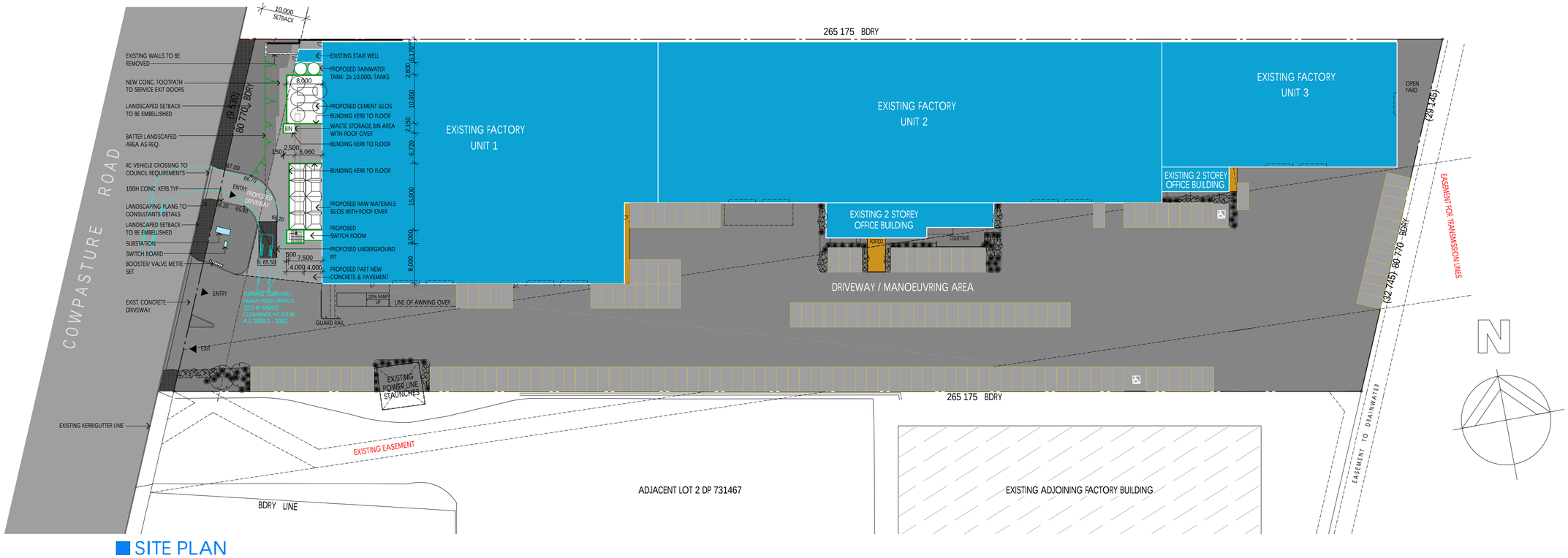

## PLANT EQUIPTMENT SCHEMATIC ELEVATIONS

SCALE 1:250




## STREET VIEW ELEVATION

SCALE 1:200




## SITE PLAN

SCALE 1:500

| Issue | By | Description | Date |
|---|---|---|---|
| A | CZ | FOR DA | 09.12.10 |

General Notes:

1) All dimensions and floor areas are to be verified by the Builder prior to the commencement of any building work. Any discrepancies are to be brought to the attention of the designer.
2) Levels shown are approximate unless accompanied by reduced levels.
3) Figured dimensions must be taken in preference to scaling.
4) All boundary clearances must be verified by the surveyor prior to the commencement of
5) Where engineering drawings are required such must take preference to this drawing.
6) Stormwater to be discharged to Councils' requirements and AS 3500.3-1990.
7) All services to be located and verified by the Builder with relevant authorities before



Consultants

| | |
|---|---|
| Date | DEC 2010 |
| Scale | 1:500 UNO |
| Drawn | S.PASSARELLI |
| Checked | C.ZAPPIA |

ALGORRY ZAPPIA & ASSOCIATES PTY. LTD.
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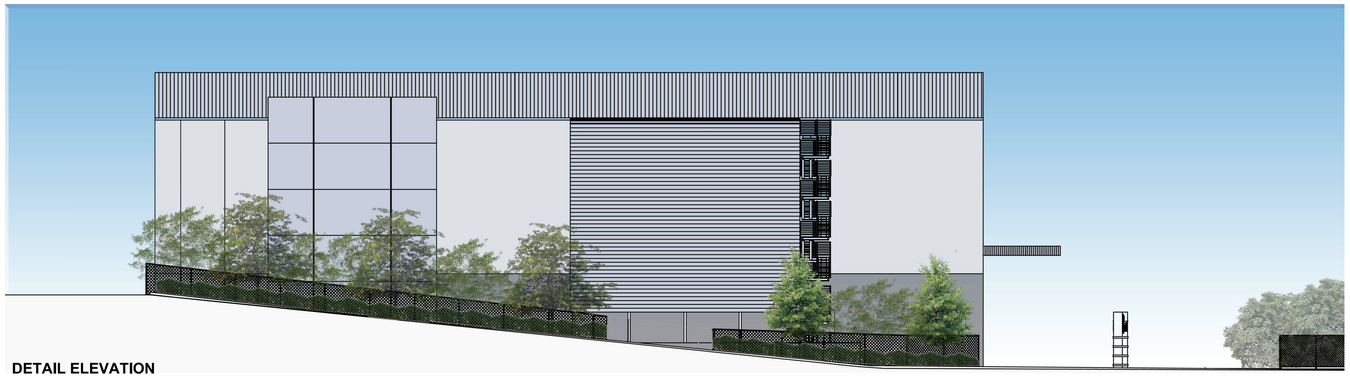
E-mail: admin@algorryzappia.com.au

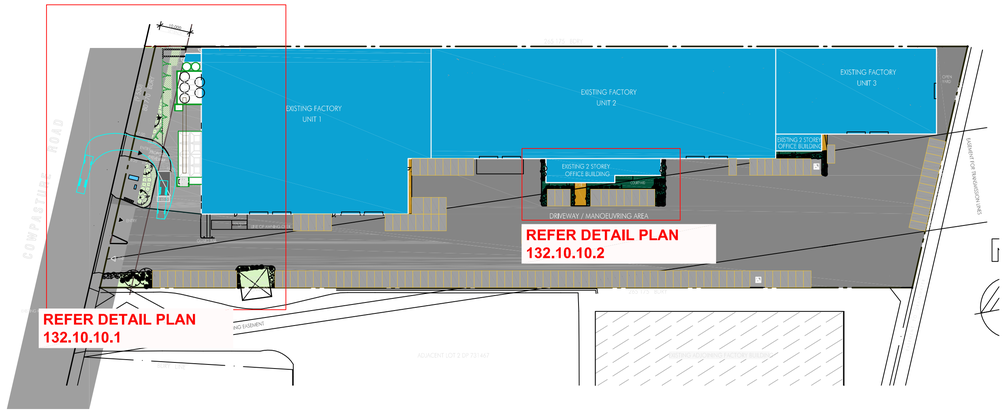
Project: INDUSTRIAL DEVELOPMENT
LOT 79 DP 27515 COWPASTURE ROAD
WETHERILL PARK

Client: AUSTRAL PRECAST CONCRETE — Project No.: P3383

| Title | Activity Type: | Job No.: | Sheet No.: | Issue |
|---|---|---|---|---|
| SITE PLAN & DETAILS. | SK | 1605-10 | A01 | A |

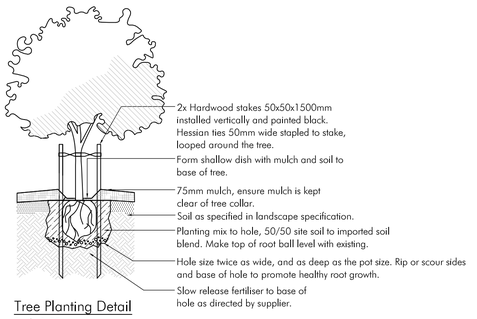


**DETAIL ELEVATION**
**132.10.10.2**
**1: 200**

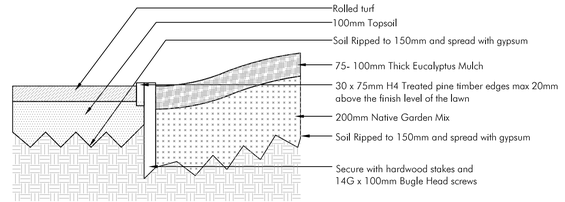



**SITE PLAN**
**1:1000**


**DETAIL PLAN 132.10.10.1**
**1: 200**




Tree Planting Detail
Scale 1:20




Typical Detail: Timber Edge to Lawn & Garden
Scale 1:10

CALLISTEMON

MYOPORUM PARVIFOLIUM

TRISTANIOPSIS LAURINA

WESTRINGIA 'ZENA'

**LEGEND**

- PROPOSED TREE.
- TREES TO BE RETAINED
- TREES TO BE REMOVED SUBJECT TO COUNCIL PERMISSION
- PROPOSED GARDEN WITH PAVER EDGE.
- TIMBER — TIMBER EDGE
- LAWN — LAWN TO BE SOFT LEAF BUFFALO
- PROPOSED CONCRETE.
- EXISTING BOUNDARY FENCE TO1800mm.

GENERAL NOTES-
Location of all services is to be carried out by all contractors prior to commencement of works. Phone Dial-Before-You-Dig Ph: 1100.
Refer plans by Architect, Engineers & Surveyors for other working drawings.
Information on Distinctive plans is for reference & co-ordination only.

This drawings are to be read in conjunction with prepared specifications & details.
It is the responsibility of the contractor to notify Distinctive of any contradiction within the plans & receive appropriate direction prior to construction works.
Final layout is to be determined on site and at the direction of the site supervisor.
Irrigation is to be used in accordance with current Water Restrictions.



| REVISION: | REVISION NOTE: | DWN BY: |
|---|---|---|
| A | Revised landscape - additional planting. 14.12.10 | VP |

PROJECT: COMMERCIAL DEVELOPMENT
ADDRESS: Lot 79 Cowpasture Road, Wetherill Park
CLIENT: Austral Precast Concrete

distinctive Living Design
landscape & interior designers, planners and consultants
distinctive DESIGN LIVING
146 Argyle Street, Camden NSW 2570
PO Box 166, Camden NSW 2570
PH: 02 4655 1881 FAX: 02 4655 5065
www.distinctive.net.au
Distinctive Gardens & Interior T/A distinctive Living Design & DLP Distinctive Land Planning

DRAWING: LANDSCAPE PLAN

| | | | |
|---|---|---|---|
| PROJECT #: | 132.10 | DWG STATUS: | DA |
| DWG DATE: | 10.11.2010 | FILE NAME: | 132.10.10 |
| PLOT DATE: | 14.12.2010 | DWG #: | 132.10.10 |
| ORIGINAL SHEET SIZE: | A1 | REVISION: | A |
| SCALE AT A1: | 1:500 | TOTAL SHEETS: | 1 |
| DRAWN: | GM/VP | SHEET #: | 1 OF 1 |
| CHECK BY: | DB | | |