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26 OCT 2015
MORELAND CITY COUNCIL

26 October 2015

Mr Robert Shatford
Planning Coordinator
Moreland City Council
Locked Bag 10
Moreland, VIC 3058

Dear Mr Shatford,

Planning Permit MPS/2013/896
34 Breese Street, Brunswick

We continue to act for Alocor Investments Pty Ltd, the owner of the above land. We write in relation to Planning Permit MPS/2013/896 ('the Planning Permit'), issued by Council on 19 January 2015, which allows:

'Construct a 5 storey building for residential use and reduction of car parking requirement.'

In response to the relevant requirements of Condition 1 of the Planning Permit, we enclose the following material:

- updated development plans prepared by *Plus Architecture*;
- an Acoustic Report prepared by *Renzo Tonin & Associates*; and
- an Environmental Audit prepared by *Aecom Australia Pty Ltd*.

Additionally, we provide the following responses to the Condition 1 requirements of the Planning Permit in numeric order.

Condition 1a

Sheets TP104 & TP105 have been updated to show opaque glazing to a height of 1.7 metres contained in a powdercoated metal frame to the south facing balcony elements.

Condition 1b

Sheet TP105 has been updated to detail the deletion of the balcony roof over Dwelling 35 to a depth of 1.8 metres from the southern boundary.

Condition 1c

Sheets TP101 has been updated to reduce the setback of the residential dwelling entrance to 3.5 metres from Breese Street.

Condition 1d

Sheet TP203 provides internal elevations that demonstrate that all habitable room windows with views to an internal light court, void or terrace are designed as floor to ceiling windows.

Condition 1e

All plan drawings have been update to specify at least one window within each room of each dwelling is operable.

Condition 1f

Sheet TP100 has been updated with dimensions demonstrating that all storage lockers maintain a minimum internal width of 1.0 metre.

Condition 1g

Sheet TP100 includes twenty-two (22) bicycle spaces, being one (1) space per dwelling and one (1) space for every five (5) dwellings.

Condition 1h

The bicycle parking area shown on Sheet TP100 has been designed in accordance with Bicycle Victoria's Bicycle Parking Handbook and is dimensioned accordingly.

Condition 1i

Section B on TP302 demonstrates that the car stacker pits maintain a depth of two (2) metres.

Condition 1j

The proposed vehicle crossing to Breese Street as shown on Sheet TP101 has been updated to include one (1) metre straight splays on both sides in accordance with Council's Standard Vehicle Crossing design.

Condition 1k

The updated plans demonstrate that no portion of the habitable building including planter boxes extends more than 300mm into the road reserve.

Condition 1l

All references to the northern 'laneway' have been delete in lieu of a 'Council Land' notation.

Condition 1m

We confirm that no substation is required by the relevant power authority for the approved development.

Condition 1n

We enclose copies of the materials and finishes schedule previously submitted with the application and referenced as Part 7.1.

Condition 1o

Sheets TP105 & TP202 have been annotated with the dimensions, materials and finishes of the pergola structure associated with Dwelling 41.

Condition 1p

Please refer to the accompanying Acoustic Report prepared by *Renzo Tonin & Associates*. The Acoustic Report finds that the impacts of traffic noise on the proposed apartments are considered minor. Accordingly, report recommends typical construction methods and no changes to the plans are required as a result and satisfying Condition 8 of the Planning Permit.

Condition 1q

Please refer to the accompanying Environmental Audit prepared by *Aecom Australia Pty Ltd*. The Environmental Audit concludes that *'the site is suitable for the issue of a Certificate of Environmental Audit (CoEA). A copy of the CoEA is attached to the Executive Summary at the start of this Environmental Audit Report. The CoEA states that the site is suitable for any beneficial use'*. Accordingly, no changes to the plans are required as a result of the Environmental Audit undertaken on the subject site, further satisfying Condition 3 of the Planning Permit.

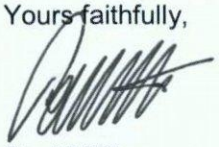
Additionally, we provide the following consultant documents to satisfy further conditions of the Planning Permit:

- An updated Waste Management Plan has been prepared by *Leigh Design Pty Ltd* to satisfy the requirements of Condition 4 of the Planning Permit;
- A landscape plan prepared by *John Patrick Pty Ltd* to satisfy the requirements of Condition 5 of the Planning Permit; and
- An updated Sustainability Management Plan has been prepared by *Lucid Consulting Australia*.

We trust that the accompanying plans and consultant documents satisfy the relevant requirements of the Planning Permit and are suitable for endorsement.

If you have any queries in relation to this matter please contact the undersigned on 8626-9070.

Yours faithfully,



Paul Little
Planning and Property Partners Pty Ltd

Encl.

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waste management plans for all urban developments	

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WASTE MANAGEMENT PLAN

Proposed Development:

34 Breese Street, Brunswick, Victoria

Prepared for:

Alocor Pty Ltd

Document Control	
Report Date:	25 October 2015 (supersedes report dated 28-10-13)
Prepared By:	Carlos Leigh, GradIEAust
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WASTE MANAGEMENT SUMMARY

- The operator, as defined below, shall be responsible for managing the waste system and for developing and implementing adequate safe operating procedures.
- Waste shall be stored within the development (hidden from external view).
- Users shall sort their waste and dispose garbage and recyclables into allocated collection bins.
- Council shall collect residential recycling. A private contractor shall collect residential garbage and all retail waste.

GLOSSARY

Operator: refers to the Owners Corporation, who shall manage site operations (via staff and contractors, if required).

User: refers to residents and commercial tenants, who shall utilise the waste system.

1 SPACE AND SYSTEM FOR WASTE MANAGEMENT

1.1 Development Description and Use

This development shall consist of residential apartments and commercial tenancies. The number of residences and commercial floor-areas are stated in Table 1 (below).

1.2 Estimated Garbage and Recycling Generation

The following table summarises the waste estimate (m^3/week):

Table 1: Waste Estimate

Waste Source	Base Qty (est.)	Garbage	Recycling
Apartments (1 bed)	No. of units = 9	0.54	0.54
Apartments (2 bed)	No. of units = 9	0.72	0.72
Retail (shop)	area (m^2) = 42	0.15	0.15
TOTAL (m^3/wk)		**1.41**	**1.41**

Note: Waste figures are based on adjusted Sustainability Victoria Guidelines.

1.3 Collection Services

Residential Waste: Based on the insufficient space for onsite storage of 12 municipal wheelie bins, Council services shall be limited to recycling collections and a private service shall be required for garbage bins. Also, this reduces the impact on the streetscape since the number of kerbside bins would be limited to 6 Council bins for recycling.

Retail Waste: Based on the expected waste volume, a private contractor shall be engaged to collect waste.

For both residential garbage and all retail waste, the operator shall choose a waste collection provider, negotiate a service agreement, and pay for these services.

Note: Every rateable tenement is liable to pay for municipal charges irrespective of the level of collection services provided by Council.

1.4 Location, Equipment, and System Used for Managing Waste

The waste management system is summarised as follows:

- Apartment receptacles for garbage and recycling.
- Tenancy receptacles at internal areas.
- Residential Bin Store located at Ground Level.
- Retail Bin Store located within the tenancy).
- Collection bins (kept within the Bin Stores - refer to Table 2).

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The various collection waste-streams are summarised as follows:

Garbage: General waste shall be placed in tied plastic bags and stored within bins.

Recycling: All recyclables shall be commingled into a single type of collection bin (for loose paper, cardboard, PET, glass, aluminum, steel, and HDPE containers).

Green Waste: Based on negligible landscaping, minimal garden waste generation is anticipated (if required, the operator shall provide a bin and request green waste services from Council).

Compost: At this development, composting is considered impractical, as there would be minimal onsite demand for compost.

Other Waste Streams: The disposal of hard/electronic/liquid and other wastes (polystyrene, batteries, paint, chemicals and detox items, etc) shall be organised with the assistance of the operator.

The following table summarises bin quantity/capacity, collection frequency, and area requirements (based on Table 1):

Table 2: Bin Schedule and Collection Frequency

Waste Source	Waste Stream	Bin Qty	Bin Litres	Collections per Week	Bin Area m^2
Apartments (shared bins)	Garbage (private)	2	660	1	2.4
	Recycling (Council)	6	240	1	3.0
Retail (dedicated bins)	Garbage (private)	1	240	1	0.5
	Recycling (private)	1	240	1	0.5
Net Bin Storage Area (excludes circulation), m^2:					**6.4**

Notes:

- Council shall provide residential recycling bins (supply cost applies).
- Private bins shall be sourced by the operator (either purchased from a supplier or leased from the collection contractor).
- Subject to stakeholders' preference/capability (and as built constraints), private bin sizes and quantities can be changed. Also, recyclables can be either commingled or split into bins for separate recycling streams.

1.5 Planning Drawings, Waste Areas, and Management of the Waste System

The plans illustrate that sufficient space has been allocated for onsite bin storage, as required by the above schedule.

Notwithstanding the above, the operator shall stipulate procedures for effective management of the available space.

1.6 Collection Bin Information

The following bins shall be utilised (see Sect. 4.3 for signage requirements):

Table 3: Bin Details

Capacity (litres)	Height (mm)	Width (across front, mm)	Depth (side on, mm)	Empty Weight (kg)	Average* Gross Weight (kg)
240	1060	585	730	13	45
660	1250	1240	780	43	130

Notes:

- * = Average Gross Weight is based on domestic waste studies (which vary subject to locality and waste-type). Expect greater weight for wet or compacted waste.
- Use the above details as a guide only – variations will occur. The above is based on Sulo plastic (HDPE) bins.

Table 4: Moreland Colour Coding

Bin	Garbage	Commingled Recycling	Green Waste
Lid	Green	Yellow	Lime
Body	Green	Green	Green

Note: For private bins, AS4123.7 bin colours can be adopted. Private bins shall be labeled to identify the waste generator and site address.

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2 ACCESS FOR USERS, COLLECTORS, AND COLLECTION VEHICLES

2.1 User Access to Waste Facilities

Residents shall dispose sorted garbage and recyclables into shared collection bins (access via the lift/stairs).

Commercial tenants shall dispose sorted waste into their bins.

2.2 Collection Arrangements and Access to Waste Facilities

- Waste shall be collected on Breese Street (site's frontage).
- Prior to the collection, the operator shall transfer Council bins from the Bin Store to kerbside (returning the bins once the collection has taken place). For private bins, the collection contractor (driver and assistant) shall transfer the bins between the Bin Stores and the truck.
- The waste collection shall be carried-out by side/rear-lift vehicles (nom. 8.8m long and 4m operational height).

3 AMENITY, LOCAL ENVIRONMENT, AND FACILITY DESIGN

3.1 Noise Minimisation Initiatives

- Collection bins shall feature rubber castors for quiet rolling during transfers.
- Waste areas shall meet BCA and AS2107 acoustic requirements.
- Local laws shall be observed for all operations in public and private areas.
- Municipal waste collections shall take place as per Council's timing/schedule.
- For private services, the hours of waste collections shall be as specified in Council's local laws. Also, Section 5 of the Victorian EPA Noise Control Guideline Publication 1254 (see below) shall be observed to protect the acoustic amenity of the development and surroundings.

Victorian EPA Noise Control Guideline Publication 1254 October 2008 (excerpt)

[Section] 5. Domestic [and Commercial] Refuse Collection

The main annoyance produced by domestic refuse collections occurs in the early morning (i.e. before 7:00am). Therefore, if possible, routes should be selected to provide the least impact on residential areas during that time.

Collection of refuse should be restricted to the following criteria:

- Collection occurring once a week should be restricted to the hours: 6am to 6pm Monday to Saturday.
- Collections occurring more than once a week should be restricted to the hours: 7am to 6pm Monday to Saturday.
- Compaction should only be carried out while on the move.
- Bottles should not be broken up at the point of collection.
- Routes which service entirely residential areas should be altered regularly to reduce early morning disturbance.
- Noisy verbal communication between operators should be avoided where possible.

3.2 Litter Reduction and Prevention of Stormwater Pollution

The operator shall be responsible for:

- Promoting adequate waste disposal into the bins (to avoid waste-dumping).
- Securing the waste areas.
- Preventing overfilled bins, keeping lids closed and bungs leak-free.
- Abating any site litter and taking action to prevent dumping and/or unauthorised use of waste areas.
- Requiring the collection contractor to clean-up any spillage that might occur when clearing bins.

The above will minimise the dispersion of site litter and prevent stormwater pollution (thus avoiding impact to the local amenity and environment).

3.3 Ventilation, Washing, and Vermin-Prevention Arrangements

Waste areas shall feature:

- Ventilation in accordance with Australian Standard AS1668.
- Impervious flooring (also, smooth, slip-resistant, and appropriately drained).

- A graded bin wash area, hosecock, hose, and a suitable floor-waste connected in accordance with the relevant authority requirements (alternatively, the operator shall engage a contractor to conduct off-site bin washing). The bin and wash areas may overlap, as stored bins can be moved so that a bin can be washed.

The operator shall regularly clean waste areas/equipment. Also, access doors and bin-lids shall be kept closed.

3.4 Design and Aesthetics of Waste Storage Areas and Equipment

Waste shall be placed within the bins and stored in designated onsite areas (hidden from external view). Following waste collection activities, bins shall be returned to the storage areas as soon as practicable.

Waste facilities shall be constructed of durable materials and finishes, and maintained to ensure that the aesthetics of the development are not compromised. These facilities and associated passages shall be suitably illuminated (this provides comfort, safety, and security to users, staff, and contractors). Access doors shall feature keyless opening from within. The design and construction of waste facilities and equipment shall conform to the Building Code of Australia, Australian Standards, and local laws.

4 MANAGEMENT AND SUSTAINABILITY

4.1 Waste Sorting, Transfer, and Collection Responsibilities

Garbage shall be placed within tied plastic bags prior to transferring into the collection bins. Cardboard shall be flattened and recycling containers un-capped, drained, and rinsed prior to disposal into the appropriate bin. Bagged recycling is not permitted.

Refer to Section 2 for waste transfer requirements and collection arrangements.

4.2 Facility Management Provisions to Maintain & Improve the Waste System

The operator shall manage site operations (refer to the glossary in page 2).

It shall be the responsibility of the operator to maintain all waste areas and components, to the satisfaction of users, staff, and the relevant authority (users shall maintain their internal waste receptacles).

The operator shall ensure that maintenance and upgrades are carried-out on the facility and components of the waste system. When required, the operator shall engage an appropriate contractor to conduct services, replacements, or upgrades.

4.3 Arrangements for Protecting Waste Equipment from Theft and Vandalism

It shall be the responsibility of the operator to protect the equipment from theft and vandalism. This shall include the following initiatives:

- Secure the waste areas.
- Label the bins according to property address.
- The private collection contractor shall transfer bins between the site and the truck (only Council bins allowed to await collection on kerbside, which once collected, shall be promptly returned to the storage areas).

4.4 Arrangements for Bins/Equipment Labelling and Ensuring Users and Staff are Aware of How to Use the Waste System Correctly

- The operator shall provide appropriate signage for the bins. Signage is available at the following internet address: www.sustainability.vic.gov.au.
- The operator shall publish/distribute "house rules" and educational material to:
  - Inform users/staff about the waste management system and the use/location of the associated equipment (provide the summary in page 2 of this report).
  - Improve facility management results (lessen equipment damage, reduce littering, and achieve cleanliness).
  - Advise users/staff to sort and recycle waste with care to reduce contamination of recyclables.

4.5 Sustainability and Waste Avoidance/Reuse/Reduction Initiatives

The *Environment Protection Act 1970* includes principles of environment protection and guidance for waste management decision making. Also, the *Sustainability Victoria Act 2005* established Sustainability Victoria as the statutory authority for delivering programs on integrated waste management and resource efficiency.

From a design perspective, the development shall support the acts by providing an adequate waste system with ability to sort waste.

The operator shall promote the observance of the acts (where relevant and practicable) and encourage users and staff to participate in minimising the impact of waste on the environment. For improved sustainability, the operator shall consider the following:

- Observe the waste hierarchy in the *Environment Protection Act 1970* (in order of preference): a) waste avoidance, b) reuse, c) recycle, d) recovery of energy, e) treatment, f) containment, and g) disposal.
- Peruse the Sustainability Victoria website: www.sustainability.vic.gov.au.
- Participate in Council and in-house programs for waste minimisation.
- Establish waste reduction and recycling targets; including periodic waste audits, keeping records, and monitoring of the quantity of recyclables found in landfill-bound bins (sharing results with users/staff).

4.6 Waste Management Plan Revisions

For any future appropriate council request, changes in legal requirements, changes in the development's needs and/or waste patterns (waste composition, volume, or distribution), or to address unforeseen operational issues, the operator shall be responsible for coordinating the necessary Waste Management Plan revisions, including (if required):

- A waste audit and new waste strategy.
- Revision of the waste system (bin size/quantity/streams/collection frequency).
- Re-education of users/staff.
- Revision of the services provided by the waste collector(s).
- Any necessary statutory approval(s).

5 SUPPLEMENTARY INFORMATION

- The operator shall ensure that bins are not overfilled or overloaded.
- Waste incineration devices are not permitted, and offsite waste treatment and disposal shall be carried-out in accordance with regulatory requirements.
- For bin traffic areas, either level surfaces (smooth and without steps) or gentle ramps are recommended, including a roll-over kerb or ramp. Should ramp gradients, bin weight, and/or distance affect the ease/safety of bin transfers, the operator shall consider the use of a suitable tug.
- The operator and waste collector shall observe all relevant OH&S legislation, regulations, and guidelines. The relevant entity shall define their tasks and:
  - Comply with Worksafe Victoria's Occupational Health and Safety Guidelines for the Collection, Transport and Unloading of Non-hazardous Waste and Recyclable Materials (June 2003).
  - Assess the Manual Handling Risk and prepare a Manual Handling Control Plan for waste and bin transfers (as per regulatory requirements and Victorian COP for Manual Handling).
  - Obtain and provide to their staff/contractors equipment manuals, training, health and safety procedures, risk assessments, and adequate personal protective equipment (PPE) to control/minimise risks/hazards associated with all waste management activities. As a starting point, these documents and procedures shall address the following:

Task (to be confirmed)	Hazard (TBC)	Control Measures (TBC)
Sorting waste and cleaning the waste system	Bodily puncture. Biological & electrical hazards	Personal protective equipment (PPE). Develop a waste-sorting procedure
Bin manual handling	Sprain, strain, crush	PPE. Maintain bin wheel-hubs. Limit bin weight. Provide mechanical assistance to transfer bins
Bin transfers and emptying into truck	Vehicular strike, run-over	PPE. Develop a Hazard Control Plan for transfers and collections. Maintain visibility. Use a mechanical bin-tipper
Truck access	Vehicular incident, strike, run-over	PPE. Use a trained spotter. Develop a truck-manoeuvring and traffic-control procedure

Note: The above shall be confirmed by a qualified OH&S professional who shall also prepare site-specific assessments, procedures, and controls (refer to Section 6).

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6 CONTACT INFORMATION

Moreland City Council (local council), ph 03 9240 1111

SITA Environmental Solutions (private waste collector), ph 131335

Wayne Cleaning Systems (private waste collector), ph 03 9484 5366

Solution for Workplace Health and Safety (OH&S consultant), ph 0425 802 669

Sulo MGB Australia (bin supplier), ph 1300 364 388

One Stop Garbage Shop (bin supplier), ph 03 9338 1411

Warequip (tug supplier – for bin transfers), ph 1800 337 711

Note: The above includes a complimentary listing of contractors and equipment suppliers. The stakeholders shall not be obligated to procure goods/services from these companies. Leigh Design does not warrant (or make representations for) the goods/services provided by these suppliers.

7 LIMITATIONS

The purpose of this report is to document a Waste Management Plan, as part of a Planning Permit Application.

This report is based on the following conditions:

- Operational use of the development (excludes demolition/construction stages).
- Drawings and information supplied by the project architect.
- The figures presented in this report are estimates only. The actual amount of waste will depend on the development's occupancy rate and waste generation intensity, the user's disposition toward waste and recycling, and the operator's approach to waste management. The operator shall make adjustments, as required, based on actual waste volumes (if the actual waste volume is greater than estimated, then the number of bins and/or the number of collections per week shall be increased).
- This report shall not be used to determine/forecast operational costs, or to prepare feasibility studies, or to document operational/safety procedures.

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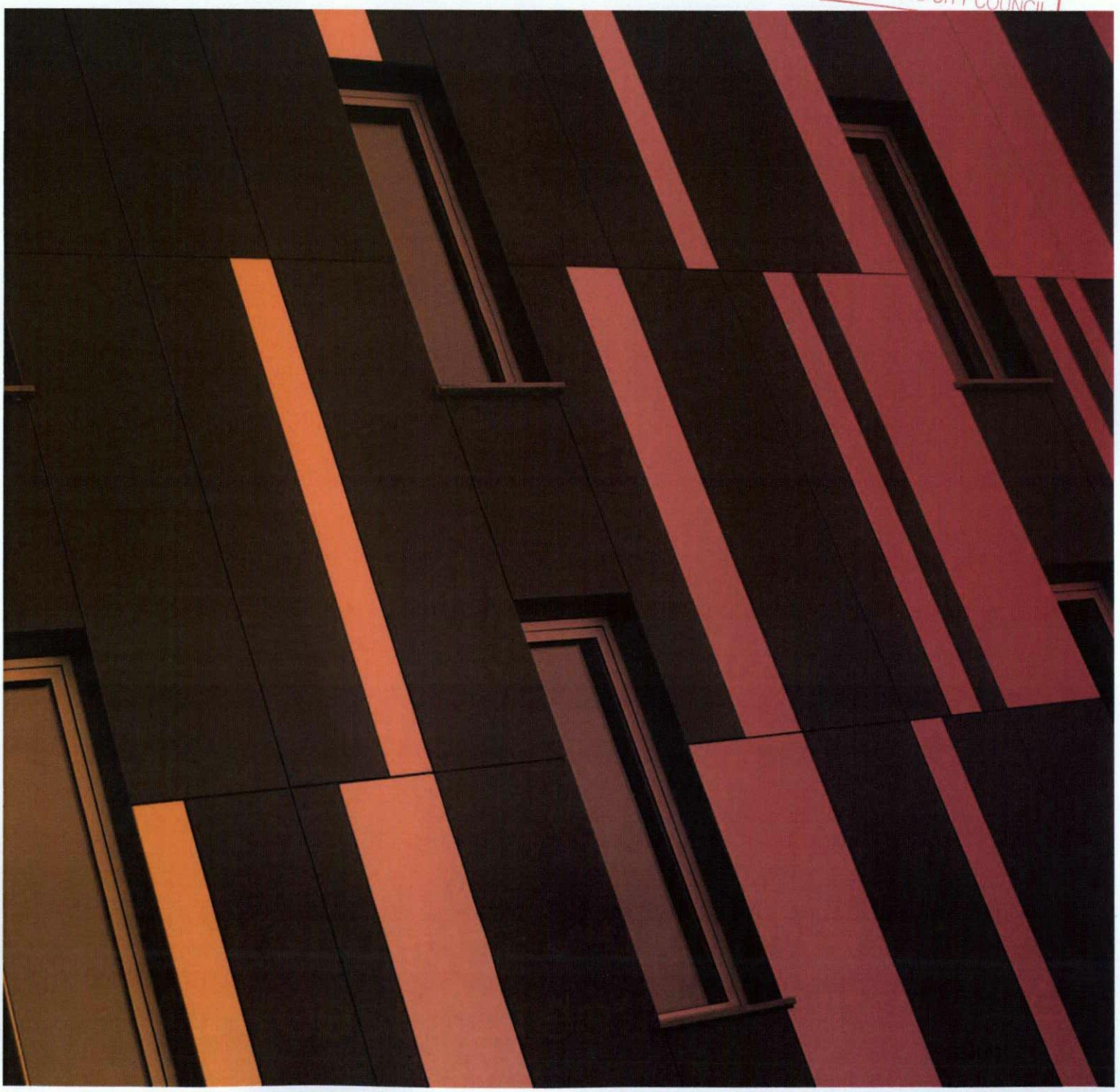
AECOM

Alocor Investments Pty Ltd
23-Sep-2015

Environmental Audit Report: 34 Breese Street, Brunswick

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EPA - CARMS: 73645-1 and SON: 8004687



Environmental Audit Report: 34 Breese Street, Brunswick

EPA - CARMS: 73645-1 and SON: 8004687

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Quality Information

Document Environmental Audit Report: 34 Breese Street, Brunswick

Ref 60428698

Date 23 September 2015

Auditor Todd Mitchell

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
0	23-Sept-2015	Document Issue	Todd Mitchell – Environmental Auditor (Contaminated Land)	

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ENVIRONMENT PROTECTION ACT 1970

CERTIFICATE OF ENVIRONMENTAL AUDIT

I, Todd Mitchell of AECOM Australia Pty Ltd, a person appointed by the Environment Protection Authority ('the Authority') under the *Environment Protection Act* 1970 ('the Act') as an environmental auditor for the purposes of the Act; having

1. been requested by Nadia Aloe of Alocor Investments Pty Ltd to issue a certificate of environmental audit in relation to the site located at 34 Breese Street, Brunswick 3056 ('the site') [Lot 2 on TP379591, title plan attached to this Certificate of Environmental Audit] owned by Alocor Investments Pty Ltd;

2. had regard to, among other things:

(i) guidelines issued by the Authority for the purposes of Part IXD of the Act;

(ii) the beneficial uses that may be made of the site; and

(iii) relevant State environment protection policies/industrial waste management policies, namely:

- State Environment Protection Policy - *Prevention and Management of Contamination of Land*;
- State Environment Protection Policy - *Groundwaters of Victoria*;
- State Environment Protection Policy - *Waters of Victoria*,
- State Environment Protection Policy – *Ambient Air Quality;*
- State Environment Protection Policy – *Air Quality Management;* and

in making a total assessment of the nature and extent of any harm or detriment caused to, or the risk of any possible harm or detriment which may be caused to, any beneficial use made of the site by any industrial processes or activity, waste or substance (including any chemical substance); and

3. completed an environmental audit report in accordance with section 53X of the Act, a copy of which has been sent to the Authority and the relevant planning and responsible authority.

HEREBY CERTIFY that I am of the opinion that the condition of the site is neither detrimental nor potentially detrimental to any beneficial use of the site.

Other related information:

(i) Groundwater at the site is assumed to be polluted such that certain beneficial uses permitted under the SEPP (Groundwaters of Victoria) are precluded. The site is not the source of the pollution and the pollution is considered not to affect any relevant beneficial uses of the site. The precluded beneficial uses include maintenance of ecosystems and agriculture, parks and gardens. The beneficial use of stock watering, industrial water use, primary contact recreation and building and structures are considered to be protected beneficial use of groundwater;

(ii) The auditor has determined that groundwater has been cleaned up to the extent practicable;

(iii) In accordance with Clause 19(3) of the SEPP (Groundwaters of Victoria) the Authority may require periodic reassessment of the practicability of groundwater clean-up;

(iv) No groundwater investigation has been undertaken at the site. Any person proposing to extract groundwater from beneath the site in the future should engage a suitably qualified professional to complete a groundwater investigation (to assess its suitability for a specific use); and

(v) Any soil that is proposed to be removed from the site after the completion of the Environmental Audit must be tested and disposed of in accordance with IWRG621 and to statutory requirements (or replacement publication/s). Also, any soil that is proposed to be imported onto the site must be classified "Fill Material" prior to use onsite (in accordance with IWRG621 or replacement publication/s).

This certificate forms part of the Environmental Audit Report (*AECOM Australia Pty Ltd, 34 Breese Street, Brunswick, 60428698, 23 September 2015).* Further details regarding the condition of the site may be found in the environmental audit report.

DATED 23.09.2015

Signed: _____

Todd Mitchell of AECOM Australia Pty Ltd
ENVIRONMENTAL AUDITOR
(appointed pursuant to the *Environment Protection Act 1970*)

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TITLE PLAN		EDITION 2	TP 379591T

Location of Land

Parish: JIKA JIKA
Township:
Section:
Crown Allotment:
Crown Portion: 125(PT)

Last Plan Reference:
Derived From: VOL 8744 FOL 249
Depth Limitation: NIL

Notations

LOT 2 ON THIS PLAN TOGETHER WITH A RIGHT OF CARRIAGE WAY OVER THE ROAD COLOURED BROWN ON THE MAP ON C/T VOL. 4745 FOL. 877

ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN

Description of Land / Easement Information

THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT
COMPILED: 03/04/2000
VERIFIED: SO'C

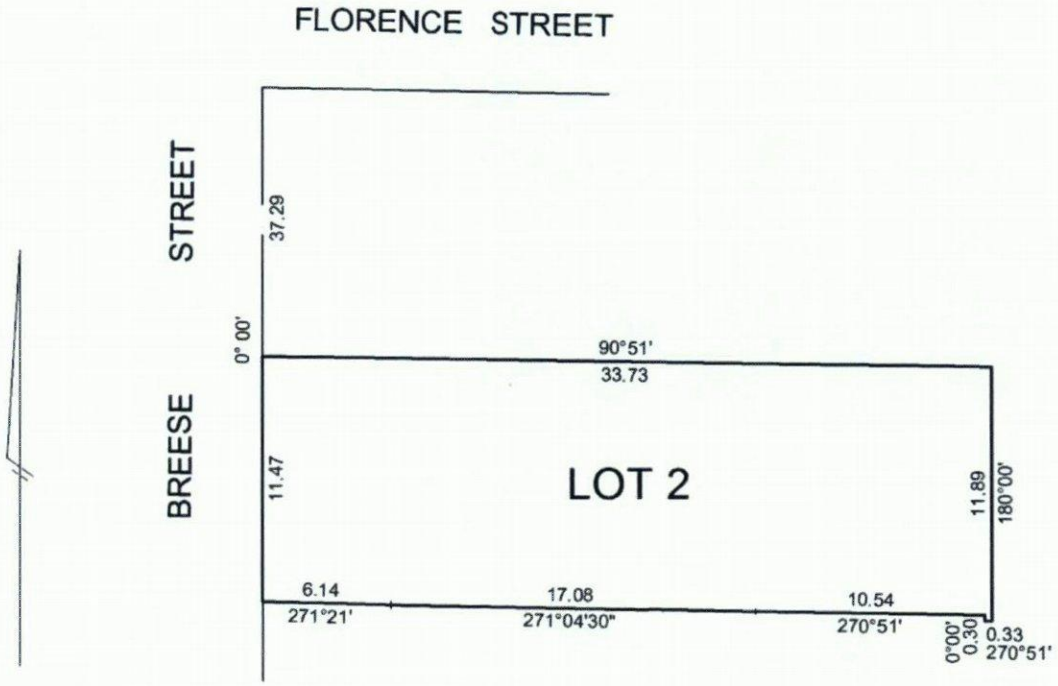


TABLE OF PARCEL IDENTIFIERS
WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962
PARCEL 2 = CP 125 (PT)

LENGTHS ARE IN METRES			Sheet 1 of 1 sheets

Executive Summary

This Environmental Audit Report has been prepared in response to a request for a Certificate of Environmental Audit (CoEA), in accordance with Part IXD of the *Environment Protection Act 1970*. In accordance with the Environment Protection Authority of Victoria (EPA) (December 2012) *Publication 1147.1 Environmental Auditor Guidelines – Provision of Environmental Audit Reports, Certificates and Statements*, a summary of the Environmental Audit is presented in Table 1.

Table 1 Summary of Environmental Audit Information

Summary of Environmental Audit Information	
Auditor	Todd Mitchell
Auditor account number	75640
Auditor appointment end date	26 February 2016
Auditors appointment category	Contaminated Land
Audit Type	53X
Date EPA notified of audit	22 May 2015
Audit service order number	8004687
Name of person requesting audit	Name: Nadia Aloe Company: Alocor Investments Pty Ltd ACN: 122 948 154 Title: Account Manager Mobile: 0412 740 573 EPA Ref.: na
Relationship of person requesting audit to site	Owner
Date of auditor engagement	21 May 2015
Completion date of audit	23 September 2015
Reason for audit	Environmental Audit Overlay
Audit Categorisation	Risk
Environmental Segments	Air, Land, Groundwater, Surface Water
If the audit was requested by EPA notice, licence or other (provide ref)	NA
Current land use zoning	Commercial 1 Zone
EPA Region	Metro
Municipality	Moreland
Dominant Lot on title plan	Lot 2 on TP379591
Additional Lot on title plan(s)	-
Site/Premises name	-
Building/complex sub-unit/lot No.	-
Street/Lot – Lower No.	34

Summary of Environmental Audit Information	
Street/Lot – Upper No.	-
Street Name	Breese
Street type	Street
Street suffix (North, South etc)	-
Suburb	Brunswick
Postcode	3056
GIS coordinate of site centroid: Latitude/Easting (GDA94) Longitude/Northing (GDA94)	 -37.762057 144.961892
Site area (m^2)	390
Plan of site showing audit boundary	Yes (Figure F1)
Plan of site in a spatial format	Yes
Members and categories of support team utilised	None
Further work or requirements	None
Nature and extent of continuing risk	None
Outcome of audit	Certificate of Environmental Audit
Has EPA determined CUTEP?	No
Has the Auditor determined CUTEP?	Yes
Has a GQRUZ been identified at the site/beyond the site by EPA?	No
Does NAPL remain at the site?	No
Protected Beneficial Uses of groundwater that are precluded due to pollution	Maintenance of Ecosystems Agriculture, Parks and Gardens
Historic land use	Clothing manufacturers
Current land use	Commercial (tool lending library)
Proposed land use	Residential – High density
Surrounding Land Use – North	Commercial
Surrounding Land Use – South	Residential (high density)
Surrounding Land Use – East	Commercial
Surrounding Land Use – West	Residential (high density)
Proposed land-use zoning	Not known
Nearest surface water receptor	Merri Creek
Distance to surface water receptor	1.7 km
Direction to surface water receptor	East

Summary of Environmental Audit Information		
Likely point of groundwater discharge	Moonee Ponds Creek (2.0 km west of the site at the closest point)	
Site aquifer formation	Newer Volcanics basalt	
Groundwater flow direction	South to south-west	
Groundwater TDS range (mg/L)	Regional salinity assumed to be 1,001 – 3,500 mg/L	
Groundwater segment	Assumed to be Segment B	
Are multiple aquifers impacted by pollution at the site?	N/A	
Perched groundwater depth (upper)	-	mbgl
Perched groundwater depth (lower)	-	mbgl
Regional groundwater depth (upper)	Not known (assumed to be between 10 and 15 m)	mbgl
Regional groundwater depth (lower)	Not known	mbgl
Number of bores within 2km	476	
Closest extractive use (distance)	1.2 km south-east of the site (cross-gradient)	
Zone of groundwater plume influence	None known	
Year groundwater last monitored	Not applicable	
Current groundwater analytical results summary table	Not applicable	

This summary must be read in conjunction with the full Environmental Audit Report and the CoEA that has been issued for the site. The Environmental Audit Report provides more data and discussions that are not in the above summary table for reasons of space and clarity. All owners of the site, all occupiers and those made responsible for the management of the site (including any future sub divisions) should be provided with a copy of this Audit report, including the CoEA.

Environmental Audit limitations are included in Section 12.0 of this report.

Table 2 Distribution List

Distribution List		
Number of copies	**Document type**	**Distributed to**
1	CD-ROM (EPA format)	Nadia Aloe – Alocor Investments Pty Ltd
	Paper copy	
1	CD-ROM (EPA format)	Principal Environmental Auditor - EPA
	Paper copy	
1	CD-ROM (EPA format)	CEO – Moreland City Council
	Paper copy	
1	Electronic	AECOM Australia Pty Ltd

1.0 Introduction

On 21 May 2015, Nadia Aloe of Alocor Investments Pty Ltd (the owner) requested Todd Mitchell (the Auditor) to complete an Environmental Audit of 34 Breese Street, Brunswick. The property is legally described as Lot 2 on TP379591 (Vol. 10968 Fol. 241), hereinafter referred to as "the site".

Figure F1 (included in Appendix A of this Environmental Audit Report) shows the site locality and boundaries of the site that is subject to this Environmental Audit. The positions of sampling locations investigated by Alpha Environmental (the Assessor) are provided in **Figure F2** (Appendix A).

1.1 Background Information

The site was used for residential purposes until 1968 when it was re-developed for commercial use by construction of the current warehouse building. Clothing manufacturers operated at the site until 2007 when the site was purchased by the current owner. The clothing manufacturer operations included cutting and sewing fabrics. Between 2007 and 2012 the site was used for an art studio. The Brunswick Tool Library (a community tool-lending library) has occupied the site since approximately 2012.

A description of the site history has been provided by Alpha Environmental (Alpha) in its Detailed Site Investigation (Alpha 2015). The site history is primarily drawn from a Phase 1 Site Contamination Assessment completed by Diomides & Associates Pty Ltd (Diomides) in September 2013 (Diomides 2013). The Auditor has further discussed this site history in Section 2 below.

The site is zoned Commercial 1 Zone (C1Z) in the municipality of Moreland City Council and has an Environmental Audit Overlay.

The Auditor has been advised that Alocor Investments Pty Ltd intends to develop the site for high density residential use. Proposed development plans are attached to Appendix C of Alpha 2015.

1.2 Purpose and objective of the Environmental Audit

The general purpose of an Environmental Audit is to evaluate whether a site is suitable for the issue of a Certificate of Environmental Audit (CoEA) indicating that the site is suitable for any beneficial use. If it is not suitable for one or more beneficial uses, then a Statement of Environmental Audit (SoEA) would be issued (stating which uses it is suitable for). A Statement may contain conditions on the use of the site.

1.3 Environmental Audit scope and methodology

The scope of work undertaken as part of this Environmental Audit included the following:

- site inspection to discuss works with the Assessor and to observe the site and surrounds;
- review and provision of comment on the Assessor's environmental reports (in regards to the completeness/adequacy of the environmental works undertaken, particularly in regards to quality assurance/quality control – QA/QC);
- liaison with the Assessor, the Client and the EPA;
- prepare and issue an Environmental Audit Report; and
- prepare and issue a Certificate of Environmental Audit.

1.4 Environmental Audit requirements

An Environmental Audit is a total assessment of the nature and extent of any harm caused to, or the risk of any possible harm or detriment which may be caused to, any beneficial use made of any segment of the environment by any industrial process or activity, waste, substance (including any chemical substance) or noise. It is noted that Section 3 of Environment Protection Authority of Victoria (February 2014) *Publication 759.2 Environmental Auditor (Contaminated Land) - Guidelines for Issue of Certificates and Statements of Environmental Audit* states that *"noise is not a relevant consideration when conducting an Environmental Audit (contaminated land) but is a factor which can impact on a beneficial use".*

The document entitled Minister for Planning (27 September 2001) *Direction No. 1 - Planning and Environment Act 1987 Section 12 (2) (a) - Potentially Contaminated Land* was originally issued in 1989, revised in 1992 and then again in 2001. This document was issued to Councils, which directed them that they must satisfy themselves that potentially contaminated land (which is proposed to be allowed under an amendment to a planning scheme) is suitable for more sensitive uses. These sensitive uses include residential use, a child care centre, a pre-school centre or a primary school.

Councils must satisfy themselves by obtaining either a CoEA or SoEA by an appointed Environmental Auditor pursuant to Part IXD of the *Environment Protection Act 1970* and its amendments for the nominated land-use(s).

A CoEA certifies that the site is suitable for all beneficial uses. A SoEA is a conditional certification with some restriction on the use of the site.

An Environmental Auditor must have regard to the requirements of relevant State Environment Protection Policies, Industrial Waste Management Policies, guidelines issued by EPA for the purpose of the *Environment Protection Act 1970*, and any National Environment Protection Measure publication. In addition, the Environmental Auditor should also refer to published guidelines and standards relevant to the assessment and Environmental Auditing of sites.

This Environmental Audit has been undertaken using the guidance contained in EPA guidelines, in particular EPA Publication 759. A full list of site specific and general reference documents used is provided in Section 13.0 of this Environmental Audit Report.

2.0 Site Setting and History

2.1 Site definition and zoning

Key site information is summarised in Table 3.

Table 3 Site Details

Site Details	
Site address	34 Breese Street
Suburb	Brunswick (3056)
Site area	390 m^2
Current site owner	Alocor Investments Pty Ltd
Lot and plan	Lot 2 on TP379591
Certificate of Title	Vol. 10968 Fol. 241
Council Property Number	12126
Local government	City of Moreland
Planning zone	Commercial 1 Zone (C1Z)
Overlays	Environmental Audit Overlay (EAO)
Current site use	Commercial (tool-lending library)

Figure F1 (in Appendix A of this Environmental Audit Report) shows the locality and boundaries of the site. A copy of the current certificate of title and plan is included in **Appendix B** of this Environmental Audit Report.

2.2 Site status and features

At the time of the Auditor final site inspection (6 August 2015) the site was covered by a two-level brick warehouse with a concrete hardstand to the west for parking three vehicles. Parking exists to the north and east of the building, however these are outside of the site boundary. A high density residential development exists directly south of the site.

2.3 Adjacent site uses

The nearby site uses are summarised in Table 4.

Table 4 Adjacent Site Uses

Adjacent Site Uses		
Direction		**Site use**
North:	Across lane	Commercial (fruit and vegetable store)
South:	Adjacent	Residential (high density)
East:	Across lane	Commercial
West:	Across Breese Street	Residential (high density)

2.4 Proposed site use

The Assessor has included in its Detailed Site Investigation (Alpha 2015, Appendix A) a series of architectural plans for the site. These plans show a five storey high density residential development comprising 18 apartments, ground floor retail and parking and a one level basement carpark.

2.5 Topography and vegetation

The site is considered generally flat, with the general area sloping gently to the south-west. The approximate site elevation is 51 mAHD (metres Australian Height Datum). The site building is slightly raised with the driveway from Breese Street gently ramped up to the building. Minor low lying vegetation is present onsite adjacent to the driveway.

2.6 Soil and geology

The Assessor described the subsurface soil and geological profile of the site and surrounds as part of the Quaternary aged Newer Volcanics Formation consisting of olivine basalts with minor scoria and ash. The Newer Volcanics are underlain by Silurian aged sandstone and siltstone of the Dargile Formation (Melbourne Formation). This was generally consistent with the subsurface profile encountered during intrusive works conducted by the Assessor. The typical soil profile that was encountered during intrusive investigations is summarised in Table 5.

Table 5 Typical Subsurface Profile

Typical Subsurface Profile	
Approximate depth range (mbgs)	Description
0.0 – 0.1	Concrete
0.1 – 0.4	Sand, minor gravel, loose, coarse-grained, brown (fill)
0.4 – limit of investigation (1.0 m)	Clay, highly plastic, firm (weathered Newer Volcanics)

2.7 Hydrology and hydrogeology

2.7.1 Surface water receptors

The Assessor identified that the nearest surface water receptor of groundwater beneath the site is likely to be Moonee Ponds Creek, located approximately 2 km to the west of the site at the closest point. Merri Creek, located approximately 1.7 km east of the site, is the closest surface water body to the site. Based on topography and the groundwater flow direction at nearby audit sites, groundwater beneath the site is considered to flow south to south-west to Moonee Ponds Creek.

There are no surface waters on-site.

2.7.2 Groundwater occurrence

Based on review of surrounding audit sites, groundwater beneath the site is expected to occur within the Newer Volcanics (a basalt fractured rock aquifer) and expected to be between 10 and 15 m below ground level (bgl).

No groundwater assessment has been conducted (or required) by the Assessor as part of this Audit.

2.7.3 Groundwater salinity and beneficial uses

Based on a desktop assessment, the Assessor described groundwater beneath the site as having a salinity in the range of 1,001 to 3,500 milligrams per litre total dissolved solids (mg/L TDS). The Assessor has concluded that groundwater beneath the site is inferred to be within Segment B in accordance with Victorian Government (December 1997) *State Environment Protection Policy - Groundwaters of Victoria* (SEPP GoV).

The protected beneficial uses of Segment B are:

- maintenance of ecosystems;
- potable mineral water supply;
- agriculture, parks and gardens;
- stock watering;
- industrial water use;
- primary contact recreation; and
- buildings and structures.

2.7.4 Nearby groundwater users

A groundwater bore search was undertaken by Diomides in September 2013 (Section 3.4 of Diomides 2013). No bores licensed for extractive uses were identified within 2 km of the site.

A review of the Visualising Victoria's Groundwater website by the Auditor on 16 September 2015 indicates that there is a total of 476 bores within 2 km radius of the site, of which 8 bores are licensed for domestic and stock purposes. The closest bores licensed for domestic and stock purposes are located approximately 1.2 km south-east of the site. The other 474 bores are not licensed for extractive purposes.

2.8 Review of EPA records

2.8.1 Nearby completed Environmental Audits

Numerous environmental audits have been completed in the vicinity of the site. Diomides reviewed six audits located within 200 m of the site in Section 3.3 of Diomides 2013. Alpha Environmental reviewed a further five audits which are summarised in Section 3.3 of Alpha 2015.

Groundwater investigations were carried out at four of the six sites reviewed by Diomides. All four sites are down-gradient or cross-gradient of this audit site. Groundwater at 597-605 Sydney Road, Brunswick (CARMS 61671-1) was reported to be impacted by trichloroethene (TCE) and nitrate. The site was not considered to be the source of the pollution. Elevated concentrations of chromium, copper, nickel, zinc and phenol were detected at 10-12 Breese Street, Brunswick (CARMS 63250-1) and were considered to be from upgradient off-site sources. Nitrate concentrations were elevated at 7-9 Florence Street, Brunswick (CARMS 69801-1), however, the site Auditor did not consider this to be pollution. Chlorinated hydrocarbons were detected in groundwater at 210 Albion Street, Brunswick (CARMS 67364-1) but did not exceed the adopted groundwater quality objectives.

The closest audit site is 37-43 Breese Street, Brunswick (CARMS 72363-1), which is the neighbouring property across Breese Street to the west of the site. Groundwater at the audit site was encountered at a depth of approximately 14 m bgl in the Newer Volcanics basalt and was anticipated to flow in a south-westerly direction to Moonee Ponds Creek. Elevated ammonia (up to 0.03 mg/L) and nitrate concentrations (up to 68 mg/L) were detected in groundwater which was considered by the site Auditor to be indicative of a diffuse source of contamination (i.e. leaking sewers). Elevated concentrations of metals (chromium, copper, nickel and zinc) were considered to be naturally occurring. The Auditor notes that the ammonia concentrations reported would not exceed the criteria that would be adopted for this audit site.

The closest upgradient audit site is 3 William Street, Brunswick (CARMS 57703-1), which is located approximately 100 m north-east of the site. One groundwater well was sampled on one occasion only. Concentrations of nitrate, copper, cyanide, phosphorus and fluoride were detected in groundwater above the adopted criteria for that site. Elevated concentrations of copper in groundwater were considered to be naturally occurring. The site Auditor considered that the nitrate, phosphorus and fluoride were likely to be associated with leaking services and that cyanide may be associated with the historical deposition of gasworks waste in the general Brunswick area. The Auditor notes that the cyanide concentration reported would not exceed the criteria that would be adopted for this audit site.

There is one groundwater quality restricted use zone (GQRUZ) within 500 m of the site. The former Brunswick Gasworks site at 21-35 Hope Street, Brunswick, approximately 250 m south-west of the site, is within a GQRUZ. Groundwater at the former gasworks site (CARMS 52306-1) was reported to be polluted with ammonia, cyanide and benzene sourced from historical site activities.

Based on the review of surrounding audit reports, the Auditor considers that the site is in the vicinity of diffuse sources of nitrate (e.g. leaking sewers) and that groundwater beneath the site may be impacted.

2.8.2 Priority sites register

The site is not listed (or within the vicinity of a site) on the EPA priority sites register.

2.9 Site history

The Auditor is of the opinion that Diomides completed a thorough site history investigation of sufficient scope to identify (as far as was practical) the potential sources and types of contamination at and about the site.

The sources of information included:

- Department of Sustainability and Environment
  - Historical Titles from 1968 to current ownership (2007 to present)
- Aerial Photographs
  - Seven aerial photographs were obtained ranging from 1951 to 2006.
- Sands & McDougall's *Directories of Victoria*
- Melbourne Metropolitan Board of Works (MMBW) Historical maps
- Victorian Groundwater Database
- Site interviews
- EPA Victoria
  - Priority sites register
  - Certificates and Statements of Environmental Audit
  - Environmental Audit Reports:
    - There are numerous environmental audit reports completed for sites in close proximity to the subject site. Diomides conducted a review of six of these (Section 3.3 of Diomides 2013). Alpha reviewed a further five reports (Section 3.3 of Alpha 2015).

The historical research indicates the site was occupied by a single residential dwelling until 1968 when it was re-developed for commercial use by construction of the current warehouse building. Clothing manufacturers operated at the site until 2007 when the site was purchased by the current owner. According to the previous site owner, clothing manufacturer operations included cutting and sewing fabrics. Between 2007 and 2012 the site was used for an art studio. The Brunswick Tool Library (a community tool-lending library) has occupied the site since approximately 2012.

The site history review has enabled the Assessor to understand the contaminants of potential concern for the site (which are further discussed in Section 3). The Auditor notes that the analytical schedule undertaken has given consideration to this.

3.0 Conceptual Site Model

A discussion of the potential sources, the potential receptors and pathways for contaminants of potential concern (COPC) is presented below. A conceptual site model has been prepared by the Assessor (Section 4 of Alpha 2015).

3.1 Contaminants of potential concern and source

The Auditor has assessed the site history and reported laboratory analysis and is satisfied that the analytes cover the COPC for the site. The analytes included:

- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethylbenzene & Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Organochlorine pesticides;
- Polychlorinated biphenyls;
- Cyanide; and
- Metals (arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium and zinc).

The source/s of these chemicals includes use of site for clothing manufacture operations and previous importation of fill material to the site.

Diomides also considered that volatile organic compounds (VOCs) were possible COPC due to the potential for use of chemicals during the site's use for clothing manufacture. VOCs were not included in the analytical suite by Alpha. The Auditor notes that the site history information did not suggest that the clothing manufacture operations included the use of volatile chemicals (for the purpose of cutting and sewing fabric) and is satisfied with the analytical suite adopted by Alpha.

Asbestos was also considered a COPC. As no asbestos was observed in soil, no laboratory analysis for asbestos was undertaken.

3.2 Potential receptors

The potential receptors of COPC beneath the site include the following:

- future commercial or residential occupiers (the Auditor is aware of the proposed high density residential development);
- site workers (during construction works during development of the site); and
- maintenance workers (conducting intrusive works).

3.3 Potential pathways

The potential pathways for exposure of receptors to the identified COPC are listed below:

- exposure of construction or maintenance workers to contaminated soil via dermal contact, ingestion, dust inhalation or vapour inhalation; and
- exposure of site occupiers to contaminants via direct contact (under the unrestricted use scenario) and vapour inhalation.

A discussion of the contamination status of the site and whether it precludes any beneficial use of the site (considering the conceptual site model) is presented in Section 8.0.

4.0 Environmental Report Review

This section of the Environmental Audit Report presents a summary of key information presented in the environmental investigation report prepared for the site. The key documents, references and their location in appendices are shown in Table 6.

Table 6 Existing Environmental Reports

Report	Reference	Location within this Audit report
Diomides & Associates Pty Ltd (September 2013) – *RE: Phase 1 Site Contamination Assessment Property: 34 Breese Street, Brunswick* (ref. CD1425 DA1595)	Diomides 2013	Appendix D of Alpha 2015
Alpha Environmental (August 2015) – *Detailed Site Investigation, 34 Breese Street, Brunswick* (ref. AE1502023-R01B)	Alpha 2015	Appendix D

4.1 Diomides 2013 – Phase 1 Site Contamination Assessment

Diomides 2013 was prepared and issued prior to the engagement of the Auditor.

The content of this report included:

- Summary of relevant background information (Diomides 2013, Sections 1 and 2);
  - Information included proposed land use, project objectives and scope of the Phase 1 assessment.
- Summary of site setting and site inspection (Sections 3.1 and 3.2);
  - Information included site description, topography and surrounding land use.
- Review of nearby audit reports (Section 3.3);
- Summary of geology, hydrogeology and groundwater database search (Sections 3.4 and 3.5);
- Review of site history information (Section 3.6);
  - The various sources of information used to evaluate the history of the site are listed in Section 0 of this Audit report.
- Identification of potential COPC based on the site history (Section 3.7);
  - The Auditor has summarised these in Section 3.1 of this Audit report.
- Discussion and conclusions (Section 4):
- Recommendations for further works (Section 5):
  - Diomides recommended that a Phase 2 site contamination assessment be completed.

4.2 Alpha 2015 – Detailed Site Investigation

The soil investigation documented in the DSI was completed prior to the engagement of the Auditor. Alpha 2015 was reviewed in detail by the Auditor as a draft report. Written feedback was provided to the Assessor and a final report was issued and reviewed.

The content of this report included:

- Summary of relevant background information (Alpha 2015, Section 1);
  - Information included project objectives and the scope of works for the assessment which comprised a grid-based soil assessment (five locations, SB01-SB05).
- Summary of site setting (Sections 2.1 to 2.6);
  - Information included site description, surrounding land use, topography, geology, hydrogeology and local groundwater uses.

- Review of site history information from Diomides 2013 (Section 2.7);
  - The various sources of information used to evaluate the history of the site are listed in Section 0 of this Audit report.
- Review of information from EPA (Section 3);
- Development of a basic conceptual site model (Section 4);
- Identification of soil screening criteria (Section 5);
- Discussion of the soil sampling methodology, results and comparison of the results against the screening criteria (Section 6);
  - Analytical results were below the adopted screening criteria for all soil samples.
- Discussion of the potential for groundwater at the site to be contaminated (Section 7);
  - The Assessor concluded that groundwater beneath the site may potentially be impacted by metals and nitrate from off-site sources.
- Identification of data quality objectives (Section 8);
- An assessment of quality assurance and control (Section 9);
  - The Auditor has evaluated Assessor QA/QC in Section 6.0 of this Audit report.
- Discussion on the protection of the beneficial uses of land based on the soil data obtained (Section 10):
  - The Assessor concluded that the beneficial uses of land were protected.
- Conclusions (Section 11); and
- Recommendations (Section 12).

The Auditor concludes that Alpha 2015 contains information of sufficient depth and breadth to adequately describe the condition of the site at the time of the assessment. The report generally meets the EPA guidelines for a site assessment report (Appendix 2 of EPA Publication 759.2).

4.3 Summary of Testing Works Conducted

The testing works conducted during the soil investigation program are summarised as follows:

- 13 April 2015:
  - Five sampling point locations were investigated;
  - Eleven primary soil samples were analysed;
  - One blind duplicate sample and one split duplicate sample were analysed; and
  - One rinsate blank and one trip blank sample were analysed.

The soil sampling locations are shown in **Figure F2** in Appendix A of this report.

5.0 Auditor Verification of Site Conditions

The Environmental Auditor and/or his representative completed inspections of the site as shown in Table 7 below.

Table 7 Auditor Site Inspections

Inspection Date	Purpose	Verification Sample Collected?
6 August 2015	Site inspection	N

The objective of the site inspection was to:

- verify the conditions of the site and surrounds; and
- inspect the Assessor sampling point locations.

It is noted that the soil sampling program undertaken by the Auditor was conducted on 13 April 2015. The Auditor was appointed on 21 May 2015. As a result, the Auditor was not able to observe the Assessor's field sampling works.

The following section presents the findings of the site inspection.

5.1 6 August 2015

During the inspection undertaken on 6 August 2015 the Auditor noted the following:

- Breese Street has a mix of residential and commercial uses. A number of former light commercial properties on Breese Street appear to have been converted for residential use;
- The site was occupied almost entirely by a two-level brick building;
- Three car parking spaces (concrete) were available fronting Breese Street;
- A very thin (~300mm) strip of land had exposed soil either side of the car space which was on a low ramp into the building (roller door). Weeds were observed in these two strips;
- A small area of exposed soil exists beside the front entrance door which has a few small plants and weeds;
- On the rear of the building residual cement was visible on the upper wall that indicates a former saw-tooth building had previously abutted the site;
- There were no obvious signs of contamination; and
- A number of photographs were taken, of which two are included below as Plates 1 and 2.



Plate 1: **View of the front of the building from Breese Street (facing east).**



Plate 2: **Rear view of building (facing north-west).**

6.0 Evaluation of Quality and Completeness

This section of the Environmental Audit Report details the QA/QC procedures and documentation undertaken by the Assessor throughout the project. This section also provides the Environmental Auditor's conclusion on the adequacy of the Assessor's QA/QC procedures (and whether the data produced can be relied upon for the purpose of the Environmental Audit).

6.1 Findings

The findings of the QA/QC review are summarised in Table 8.

Table 8 Quality Assurance and Quality Control Evaluation

Quality Assurance and Quality Control Evaluation		
Item	**Soil Investigation**	**Adequate**
Qualifications of field staff	Based on the review of the report, correspondence with project managers and known experience of scientists used, the Auditor is of the opinion that Assessor staff are suitably qualified and experienced.	Yes
Sample preservation	The Assessor stated that samples were placed into laboratory supplied containers before being placed on ice in an insulated cooler, while in transit to the laboratory. The Assessor stated that laboratory supplied vessels were pre-preserved (where required) by the laboratory.	Yes
Analytical schedule	On the basis of the site history and potential contaminants of concern, the Auditor is of the opinion that the analytical program undertaken sufficiently characterises COPC in soil at the site.	Yes
Laboratories used	Alpha used Eurofins | mgt as the primary laboratory and Envirolab Services as its secondary laboratory. The laboratories used by the Assessor are National Association of Testing Authorities (NATA) accredited for the analysis requested.	Yes
Equipment decontamination	The Assessor stated that they used a new pair of disposable nitrile gloves to collect samples. The Assessor also stated that sampling equipment was decontaminated between sampling points.	Yes
Selection of investigation locations	The soil assessment works consisted of five (5) grid-based boreholes (SB01 to SB05) across the site. The Auditor has undertaken a review of the distribution of sampling locations and is of the opinion that they are satisfactory for the purposes of this project.	Yes
Sampling density	The sampling density recommended for site characterisation in *Australian Standard AS4482.1 - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil* is five (5) locations for a site of 0.05 ha. Samples were collected and analysed from five locations investigated during the soil assessment works (the site is 0.04 ha in area). The Auditor is satisfied with the sampling density investigated as part of this project.	Yes
Sampling methods	The Assessor collected samples using a hand auger. The Auditor is of the opinion that the sampling method employed is adequate.	Yes
Target depths	The Auditor is of the opinion that the depths advanced were sufficient to characterise soils and COPC at the site. Samples were collected of fill material and natural soils.	Yes
Equipment calibration	A PID is noted to have been used during the soil assessment works. The calibration certificate is included in Appendix G of Alpha 2015.	Yes

Quality Assurance and Quality Control Evaluation		
Item	**Soil Investigation**	**Adequate**
Sample nomenclature	The Assessor utilised sample nomenclature to distinguish between soil bore samples. The Auditor is satisfied that the labelling used is adequate to identify the soil location, depth and date of samples collected.	Yes
Logging	The Auditor has reviewed bore logs prepared by the Assessor which are included in Appendix H of Alpha 2015. The bore logs are considered adequate for the purpose of this Audit.	Yes
Field screening	Field observations of odour, staining and fill types were noted on the bore logs. In addition, soil samples were field screened for the presence of VOCs using a PID.	Yes
Chain of Custody (CoC) documentation	The Assessor has prepared CoC documentation for soil sampling and included these in its report (Appendix J of Alpha 2015).	Yes
QC rinsate blanks	One rinsate blank sample was collected during the soil assessment works. The results are discussed in Section 6.2 of Alpha 2015. The rinsate sample was analysed for TRHs, BTEX, naphthalene and metals. Results were below the LOR. The Auditor considers that the Assessor has undertaken adequate decontamination and collected adequate rinsate samples.	Yes
QC trip blanks	One trip blank sample was collected during the soil assessment works. The results for the trip blank sample are discussed in Section 6.2 of Alpha 2015. The trip blank was analysed for C6-C10 TRHs, BTEX and naphthalene. No analytes were detected in the trip blank sample submitted for analysis. The Auditor is satisfied that cross-contamination has not occurred and that the data can be relied upon.	Yes
QC field duplicate and split sample collection density	In total the Assessor collected one blind (intra-laboratory) duplicate [QC1] and one split (inter-laboratory) duplicate [QC1A]. AS4482.1 recommends that duplicates are collected at a rate of 1 in 20 (5%). A total of 11 primary samples were collected. As a percentage the duplicate collection rate equates to 9% and exceeds the minimum requirement of AS4482.1. The Auditor is of the opinion that sufficient quality control (blind and split duplicate) samples have been collected and analysed.	Yes
QC field duplicate and split data precision	Data precision has been evaluated by the Assessor and reviewed by the Auditor. The results are discussed in Section 6.1 and tabulated in Appendix K of Alpha 2015. There were a number of duplicate sets which had a RPD value greater than the acceptance criteria (50% was applied), however, the Assessor has considered each of these in the context of the whole QC data set. The Assessor notes that heterogeneity of the fill material may have been a factor. The Auditor is satisfied that there is sufficient data which meets the requirements of AS4482.1 to enable the analytical results to be considered precise.	Yes
Laboratory internal QC procedures	A review of laboratory internal QC procedures was discussed by the Assessor in Section 6.4 of Alpha 2015 and has been reviewed by the Auditor. Elements such as duplicate sample RPD, laboratory control spike recovery, matrix spike recovery and laboratory blanks. The findings of the review were that no non-conformances were identified and their review indicated the primary results reported by the laboratories could be relied upon.	Yes

Quality Assurance and Quality Control Evaluation		
Item	**Soil Investigation**	**Adequate**
Holding times	The Auditor has reviewed analytical reports prepared by the laboratory and is satisfied that samples have been extracted and analysed within acceptable holding times.	Yes
Laboratory's LOR	The laboratory LORs were less than the adopted investigation criteria in soil samples.	Yes
Data validation	The Assessor prepared a validation of assessment data. A statistical assessment has not been prepared for the soil data given the relatively small number of samples. The validation of assessment data has been reviewed by the Auditor and is considered acceptable for the purposes of this Audit.	Yes
Completeness of data set	The Auditor considers that the number of samples collected and chemicals analysed is sufficient to characterise soil at the site.	Yes
Composites	No compositing of soil samples was undertaken.	Yes
Waste management	The Assessor advised that soil cuttings were re-instated at the site.	Yes

6.2 Soil Gas Investigation

A soil gas investigation was not undertaken as it was not considered necessary for the site. The site soils are not impacted with respect to volatile chemicals.

6.3 Data Set Quality Assurance

In addition to the field and laboratory QA/QC assessment already undertaken, the Auditor has considered the following elements (in making a conclusion on whether the data set can be relied upon):

- scope of works undertaken;
- geology (regional anticipated and actual encountered during intrusive works);
- topography (regional anticipated and actual encountered during site inspections);
- the anticipated COPC (derived from the desktop site history review) and the actual COPC encountered during intrusive works.

The Auditor concludes the following:

- the scope of work undertaken is adequate;
- the site specific geology and topography encountered during the Assessor's field work program (and confirmed during the Audit site inspection) is in agreement with the anticipated regional conditions;
- the COPC encountered in soil during the Assessor's field work program were what was anticipated during the desktop site history review; and
- based on this, the data set is considered to be accurate, precise and representative of actual site conditions (and can be relied upon for the purpose of this Environmental Audit).

6.3.1 Auditor conclusion on QA/QC and on the reliability of data

In conclusion, the Auditor is of the opinion that the procedures conducted and data set obtained is of sufficient quality and quantity to adequately characterise the status of contaminant indicators at the site. As such, the Auditor considers it can be relied upon for the purposes of this Environmental Audit.

7.0 Beneficial Uses and Environmental Quality Objectives

The Environmental Audit process requires that the levels of contaminant indicators reported be assessed in the context of beneficial uses that need to be protected. The applicable segments of the environment need to be considered (i.e. soil, groundwater, surface water and air), which are discussed in more detail below.

7.1 National Environment Protection Measure & Amendment

The National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (referred to herein as 'the NEPM') is the premier guidance document in Australia for the assessment of site contamination. The NEPM is made under the *National Environment Protection Council Act 1994* and is given effect by individual legislation and guidelines in each state and territory. In Victoria, these include the regulatory frameworks established in the relevant State Environment Protection Policy (SEPP) documents discussed in the following sections.

The NEPM guidance document was subject to a review process that commenced in 2004 and concluded with the NEPC approving an amending instrument to the 1999 NEPM in April 2013 (NEPC, 2013, *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*). The amended 2013 NEPM guidance came into effect on 16 May 2013. The amendment includes repealing all the original schedules to the 1999 NEPM guidance and the substitution of new schedules. Implementation of the amended 2013 NEPM is the responsibility of each state jurisdiction.

Regulators in the states and territories of Australia agreed to a transition period of up to 12 months for full implementation of the amended 2013 NEPM via any legislative or administrative steps required to put the amendment into effect (Standing Council on Environment and Water, 2013). During this transition period regulators may allow companies to finalise and submit work which is consistent with the original NEPM and already substantially progressed. The transition period ended on 16 May 2014. It is noted that the SEPP (PMCL) was varied on 24 September 2013 to capture modifications to the schedules within the NEPM.

7.2 Soil (Land)

The Victorian Government (June 2002) *State Environment Protection Policy - Prevention and Management of Contamination of Land* [SEPP (PMCL)] provides the framework for the protection of land and associated beneficial uses throughout Victoria. This policy allows for a consistent approach to the prevention of contamination of land, and clean-up of pollution of land in Victoria, and sets environmental quality indicators and objectives for each beneficial use. The SEPP (PMCL) defines certain land use categories and associated beneficial uses of land to be protected - summarised in Table 9. The environmental quality indicators and objectives are detailed further in Table 10.

At the time of this Environmental Audit, the site is zoned Commercial 1 Zone and has an Environmental Audit Overlay.

It should be noted that regardless of the proposed or potential future site use, in order to issue a CoEA for a site an assessment of all beneficial uses of land is required. These land use scenarios defined in SEPP (PMCL) are as follows:

- parks and reserves;
- agricultural;
- sensitive use (high density);
- sensitive use (other);
- recreation/open space;
- commercial; and
- industrial.

The beneficial uses that are protected for a site where any land use is being assessed are as follows:

- maintenance of ecosystems;
- human health;

- buildings and structures;
- aesthetics; and
- production of food, flora and fibre.

Table 9 Protected Beneficial Uses of Land

Beneficial Use	Land Use						
	Parks and Reserves	Agricultural	Sensitive Use		Recreational / Open Space	Commercial	Industrial
			High Density	Other			
Maintenance of ecosystems							
Natural ecosystems	✓						
Modified ecosystems	✓	✓		✓	✓		
Highly modified ecosystems		✓	✓	✓	✓	✓	✓
Human health	✓	✓	✓	✓	✓	✓	✓
Buildings and structures	✓	✓	✓	✓	✓	✓	✓
Aesthetics	✓		✓	✓	✓	✓	
Production of food, flora & fibre	✓	✓		✓			

Table 10 Indicators and Objectives for Land

Beneficial use	Indicators	Objectives
Maintenance of ecosystems	Concentration of COPC	Contamination must not adversely affect the maintenance of relevant ecosystems, and the level of any indicator must not be greater than any regional Ecological Investigation Level developed in accordance with the NEPM, levels derived using the risk assessment methodology in NEPM or levels approved by EPA.
Human health	Concentration of COPC	Contamination must not cause an adverse effect on human health and the level of any indicator must not be greater than the investigation level (IL) specified for human health in NEPM, levels derived using a risk assessment methodology described in NEPM, or levels approved by EPA.
Buildings and structures	pH; sulphate; ORP; salinity; other substance or waste that may have a detrimental impact on the structural integrity of buildings and other structures.	Contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials.

Beneficial use	Indicators	Objectives
Aesthetics	Any chemical substance or waste that may be offensive to the senses.	Contamination must not cause the land to be offensive to the senses of human beings.
Production of food, flora and fibre	Concentration of COPC	Contamination must not adversely affect produce quality or yield; and affect the level of an indicator in the food, fibre or flora produced at the site (or that may be produced) such that the level of that indicator is greater than that specified in the Australian and New Zealand Food Authority Standards Codes.

7.2.1 Maintenance of Ecosystems

Schedule B1 of the NEPM Amendment provides ecologically based investigation levels (EILs) for the protection of terrestrial ecosystems for a small number of common contaminants developed for Australian conditions. These include:

- Generic level for aged arsenic (As);
- Added contaminant limit for copper (Cu) using cation exchange capacity (CEC) or pH;
- Added contaminant limit for chromium III (CrIII) using %clay;
- Added contaminant limit for nickel (Ni) using CEC;
- Added contaminant limit for lead (Pb);
- Generic level for fresh DDT;
- Generic level for fresh naphthalene; and
- Added contaminant limit for aged zinc (Zn) using pH and CEC.

Alpha calculated EILs for urban residential and public open space land use using the average CEC (rounded to the nearest five) and pH for fill material and natural material, respectively. The mean concentrations of metals in the natural soils were considered to be representative of the ambient background concentrations. The Auditor is satisfied that the EILs calculated are suitable for the purposes of this Audit.

Ecological Screening Levels (ESLs) are also provided for TPH, BTEX and B(a)P.

Both EILs and ESLs relate to the three generic land use settings as follows:

- areas of ecological significance;
- urban residential areas and public open space; and
- commercial and industrial land uses.

The Auditor has applied the EILs and ESLs for urban residential areas and public open space using fine texture and aged (greater than 2 years) contamination where appropriate.

Site specific EILs are to be derived 'as needed' in accordance with Schedule B5c of the NEPM Amendment. Other alternative reference criteria can be referred to if justifiable and suitable for the site setting.

For analytes where there are no EILs published in the NEPM Amendment the Auditor has adopted the following (please also refer to Table 11):

- ANZECC (1992) Environmental Investigation Levels:
  - Environmental Investigation Levels from ANZECC (1992) have been adopted for tin as there is no NEPM EIL;

- USEPA Ecological Soil Screening Levels (as amended from time to time):
  - The USEPA Ecological Soil Screening Levels (Eco-SSLs) are adopted by the Auditor for barium, beryllium, chromium (VI), cobalt[1], vanadium and total PAHs as there is no NEPM EIL.
- CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (2007):
  - For the protection of modified ecosystems, the Auditor has adopted the CCME (2007) Residential/Parkland values for Total PCBs and TCE.
  - The CCME (2007) Residential/Parkland values have been adopted for some metals where there is no NEPM EIL or USEPA Ecological Soil Screening Levels Eco-SSLs (i.e. cadmium[2] and mercury).
- The upper limit for fill material for selenium from EPA Publication IWRG621 has been adopted[3].

7.2.2 Human Health

Schedule B1 of the NEPM Amendment provides Health-based investigation levels (HILs) for a broad range of metals and organic chemicals.

The HILs are generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. The HILs are intentionally conservative and are based on a reasonable worst case scenario for the following four generic land use settings:

- **HIL A:** residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools);
- **HIL B:** residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats;
- **HIL C:** public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate; and
- **HIL D:** commercial/industrial such as shops, offices, factories and industrial sites.

Levels slightly in excess of the HILs do not imply unacceptability, or that a significant health risk is likely to be present. Exceeding an HIL means further investigation is required and not 'risk is present, clean-up required'.

Schedule B1 of the NEPM Amendment also provides Health Screening Levels (HSLs) for selected petroleum compounds and fractions, and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physicochemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to greater than 4 mBGL. Further detail on their use is provided in Friebel, E and Nadebaum, P (September 2011) *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide Australia* (CRC CARE 2011). The screening levels shown for TRHs, BTEX and naphthalene are Direct Contact guidelines.

For the assessment of asbestos, the Auditor has referred to the NEPM Amendment which in turn refers to the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (WA DoH 2009). Schedule B1 and Schedule B2 recommends a general process for the assessment of asbestos. The process starts with a Preliminary Site Investigation (PSI), which may lead to a Detailed Site Investigation (DSI). It is noted that a DSI is not necessary where there is a high degree of confidence that the asbestos contamination is confined to bonded ACM in superficial soil. The WA guidelines apply screening levels of:

- 0.01% w/w asbestos in soil for ACM (being asbestos in bonded ACM) to residential sites equivalent to land use setting HIL A. Additional criteria are provided for other land uses based on the default exposure ratios of the NEPM (1999); and
- 0.001% w/w asbestos in soil for friable asbestos (FA) and asbestos fines (AF) for all site uses.

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[1] The Auditor has adopted the Eco-SSL for avian wildlife rather than the more conservative Eco-SSL for plants as the plant Eco-SSL is similar to the median background concentration for soils derived from Newer Volcanics basalt (Diomides 2005).

[2] It is noted that there is a USEPA Ecological Soil Screening Level for cadmium, however, the level published for the most conservative ecological receptor (mammalian, in the case of cadmium) is below the laboratory method detection limit (<0.4 mg/kg). CCME (2007) has therefore been referred to in this instance.

[3] It is noted that there is a CCME (2007) Residential/Parkland value for selenium, however, the value is below the laboratory detection limit (<5 mg/kg). EPA Publication IWRG621 has therefore been referred to in this instance.

The Auditor notes that no soil samples were analysed for asbestos in this project. The Assessor did not observe any visible asbestos (in soil) during the site investigation.

For analytes where there are no human HILs published in the NEPM, the Auditor has adopted the following:

- USEPA Regional Screening Levels (RSL) [as amended from time to time]:
  - In the absence of a defined Soil Quality Criteria in the NEPM Amendment for barium, tin, vanadium, and fluoride. Low density residential criteria have been conservatively adopted for screening high density residential and public open space land uses.

7.2.3 Buildings and Structures

The SEPP (PMCL) states that the contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials.

The exposure classification for concrete and steel piles considered for the purpose of this Environmental Audit was Standards Australia (2009) *Australian Standard AS2159 Piling-Design and Installation* (AS2159). This standard provides exposure conditions for sulfates (expressed as SO_4), chlorides and pH in order to assess soil conditions under an exposure classification.

7.2.4 Aesthetics

The SEPP (PMCL) states that contamination must not cause the land to be offensive to the senses of human beings. Aesthetic issues may include: discoloured soil (stained from spills), solid inert waste (bricks, glass, steel, polyvinylchloride, etcetera); fill material with waste (ash, coke, black carbon, foundry slag, etcetera) and offensive odours. Section 14.1 of the Auditor Guidelines (759.2) also states that (assuming nothing else precludes the issuing of a Certificate), "The presence of small amounts of solid inert waste such as minor building and other debris such as is typically found in urban environments, need not preclude issue of a Certificate."

7.2.5 Production of Food, Flora and Fibre

The SEPP (PMCL) defers to the levels referenced in the Australian and New Zealand Food Authority Standards Codes for assessing the production of food, flora and fibre at a site. In this case, the Assessor has used (and the Auditor agrees) the EIL (which are the most sensitive IL) as an initial screening level.

7.2.6 Further Considerations

It should be noted that exceedances of these HIL does not mean the land is not safe, it means further investigation is required. In addition, the HIL guidance should only be applied statistically and therefore where adequate characterisation of soil contamination has been completed. This requires that firstly data quality is acceptable and secondly that a representative sample data is provided. The data should also be interpreted in terms of background and natural variances in assumptions in the standard scenarios. NEPM requires the mean concentration of a contaminant be used as a basis for assessment.

NEPM also states that, at the very least, the 95 % upper confidence limit (UCL) of the arithmetic mean should be compared to the relevant Tier 1 trigger levels. The results should also meet the following criteria:

- The standard deviation of the results should be less than 50% of the relevant investigation level; and
- No single value should exceed 250% of the relevant investigation level.

Table 11 Adopted Soil Quality Objectives for Beneficial Uses of Land

Analyte	MoE & PFFF	Human Health				
		Residential (low)	Residential (high)	Public Open Space	Commercial/ Industrial	Buildings and Structures
Antimony	20 [C]	31 [J]	31 [K]	31 [K]	470 [J]	
Arsenic	100 [F]	100 [H]	500 [H]	300 [H]	3,000 [H]	-
Barium	330 [B]	15,000 [J]	15,000 [K]	15,000 [K]	220,000 [J]	-
Beryllium	21 [B]	60 [H]	90 [H]	90 [H]	500 [H]	-
Boron	*	4,500 [H]	40,000 [H]	20,000 [H]	300,000 [H]	-

Analyte	MoE & PFFF	Human Health				
		Residential (low)	Residential (high)	Public Open Space	Commercial/ Industrial	Buildings and Structures
Cadmium	10 [C]	20 [H]	150 [H]	90 [H]	900 [H]	-
Chromium III (%clay <1 (f), >10 (n))	230 (f), 440 (n) [G]	-	-	-	-	-
Chromium VI	130 [B]	100 [H]	500 [H]	300 [H]	3,600 [H]	-
Cobalt	120 [B]	100 [H]	600 [H]	300 [H]	4,000 [H]	-
Copper (CEC 10 (f), 30 (n), pH 7.3 (f), 7.2 (n))	210 (f), 240 (n) [G]	6,000 [H]	30,000 [H]	17,000 [H]	240,000 [H]	-
Lead	1,100 [G]	300 [H]	1200 [H]	600 [H]	1,500 [H]	-
Manganese	500 [A]	3,800 [H]	14,000 [H]	19,000 [H]	60,000 [H]	-
Mercury	6.6 [C]	40 [H]	120 [H]	80 [H]	730 [H]	-
Nickel (CEC 10 (f), 30 (n))	190 (f), 370 (n) [G]	400 [H]	1,200 [H]	1,200 [H]	6,000 [H]	-
Selenium	10 [D]	200 [H]	1,400 [H]	700 [H]	10,000 [H]	-
Tin	50 [A]	47,000 [J]	47,000 [K]	47,000 [K]	700,000 [J]	-
Vanadium	280 [B]	390 [J]	390 [K]	390 [K]	5,800 [J]	-
Zinc (CEC 10 (f), 30 (n), pH 7.3 (f), 7.2 (n))	420 (f), 1,000(n) [G]	7,400 [H]	60,000 [H]	30,000 [H]	400,000 [H]	-
Cyanide (free)	-	250 [H]	300 [H]	240 [H]	1,500 [H]	-
Fluoride	450 [D]	3,100 [J]	3,100 [K]	3,100 [K]	47,000 [J]	-
Sulfate (as S)	-	-	-	-	-	1,665 [L]
Sulfate (as SO_4)	-	-	-	-	-	5,000 [L]
pH	-	-	-	-	-	>5.5 [L]
TRH C_6-C_{10}	**180 [E]	4,400 [I]	5,600 [I]	5,100 [I]	26,000 [I]	-
TRH >C_{10}-C_{16}	120 [E]	3,300 [I]	4,200 [I]	3,800 [I]	20,000 [I]	-
TRH >C_{16}-C_{34}	300 [E]	4,500 [I]	5,800 [I]	5,300 [I]	27,000 [I]	-
TRH >C_{34}-C_{40}	2,800 [E]	6,300 [I]	8,100 [I]	7,400 [I]	38,000 [I]	-
Naphthalene	170 [F]	1,400 [I]	2,200 [I]	1,900 [I]	11,000 [I]	-
B(a)P	0.7 [E]	-	-	-	-	-
Carcinogenic PAHs (as B(a)P TEQ)	-	3 [H]	4 [H]	3 [H]	40 [H]	-
Total PAHs	18 [B]	300 [H]	400 [H]	300 [H]	4000 [H]	-
Benzene	50 [E]	100 [I]	140 [I]	120 [I]	430 [I]	-
Toluene	85 [E]	14,000 [I]	21,000 [I]	18,000 [I]	99,000 [I]	-
Ethylbenzene	70 [E]	4,500 [I]	5,900 [I]	5,300 [I]	27,000 [I]	-
Xylenes	105 [E]	12,000 [I]	17,000 [I]	15,000 [I]	81,000 [I]	-

Analyte	MoE & PFFF	Human Health				
		Residential (low)	Residential (high)	Public Open Space	Commercial/ Industrial	Buildings and Structures
Total PCBs	1.3 [C]	1 [H]	1 [H]	1 [H]	7 [H]	-
TCE	0.01 [C]	4.1 [J]	4.1 [K]	4.1 [K]	19 [K]	-
DDT	180 [F]	-	-	-	-	-
DDT+DDE+DDD	-	240 [H]	600 [H]	400 [H]	3,600 [H]	-
Phenol	-	3,000 [H]	45,000 [H]	40,000 [H]	240,000 [H]	-
Bonded ACM	-	0.01% [H]	0.04% [H]	0.02% [H]	0.05% [H]	-
FA and AF (friable asbestos)	-	0.001% [H]				-
All forms of asbestos	-	No visible asbestos for surface soil [H]				-

Notes:

All units are in mg/kg (unless indicated otherwise)

MoE = Maintenance of Ecosystems

PFFF = Production of Food, Flora and Fibre.

FA = fibrous asbestos;

AF = asbestos fines;

TRH = Total Recoverable Hydrocarbons

[A] = ANZECC (1992);

[B] = USEPA Eco-SSLs;

[C] = CCME (2007);

[D] = EPA Publication 621 (Upper Limit for Fill Material);

[E] = NEPM (as amended 2013) – ESLs for 'urban residential and public open space' (coarse texture);

[F] = NEPM (as amended 2013) – EILs for 'urban residential and public open space';

[G] = NEPM (as amended 2013) – Calculated EILs, (f) – fill, (n) – natural;

[H] = HILs provided in Table 1A(1) NEPM (as amended 2013);

[I] = HSLs for direct contact provided in Table 4 CRC Care Technical Report 10 (2011) – not criteria for vapour intrusion risk;

[J] = USEPA (Regional Screening Levels) – for TCE the non-carcinogenic screening level has been adopted as it is lower than the carcinogenic screening level when the carcinogenic level is adjusted for 1 $x10^{-5}$ target risk;

[K] = USEPA (Regional Screening Levels) for low density residential conservatively adopted;

[L] = CSA (2009) AS2159-2009 Australian Standard: Piling – Design and Installation;

** = No guideline available. Evaluation of risks to ecosystems based on ambient background concentrations as per NEPM 2013.*

*** = guideline is for the C_6-C_{10} fraction minus the sum of BTEX concentrations (Fraction F1).*

7.2.7 Offsite disposal

Any soils disposed of offsite must be classified in accordance with IWRG621 and IWRG702 (or their replacement publications).

7.3 Groundwater

The SEPP (GoV) provides the framework for the protection of groundwater and its associated beneficial uses throughout Victoria. This policy allows for a consistent approach to the prevention of contamination of groundwater and clean-up of pollution of groundwater throughout Victoria and sets environmental quality indicators and objectives for each beneficial use. The SEPP (GoV) defines certain aquifer categories based on salinity reported as TDS and associated beneficial uses to be protected. The beneficial uses of groundwater to be protected are shown in Table 12 (a reproduction of Table 2 from the SEPP (GoV)).

Table 12 Protected Beneficial Uses of Groundwater

Beneficial Uses	Segments (mg/L TDS)				
	A1 (0 - 500)	A2 (501 - 1,000)	B (1,001 - 3,500)	C (3,501 - 13,000)	D (> 13,000)
1. Maintenance of ecosystems	✓	✓	✓	✓	✓
2. Potable water supply:					
Desirable	✓				
Acceptable		✓			
3. Potable mineral water supply	✓	✓	✓		
4. Agriculture, parks & gardens	✓	✓	✓		
5. Stock watering	✓	✓	✓	✓	
6. Industrial water use	✓	✓	✓	✓	✓
7. Primary contact recreation (e.g. bathing, swimming)	✓	✓	✓	✓	
8. Buildings and structures	✓	✓	✓	✓	✓

The beneficial uses identified in SEPP (GoV) for Segment B classified groundwater are:

- maintenance of ecosystems;
- potable mineral water supply;
- agriculture, parks and gardens;
- stock watering;
- industrial water use;
- primary contact recreation; and
- buildings and structures.

EPA may determine that these beneficial uses do not apply to groundwater when:

- there is insufficient yield;
- the background levels of a water quality indicator other than TDS precludes a beneficial use;
- the soil characteristics preclude a beneficial use; and
- EPA has declared that the site is within a groundwater quality restricted use zone.

In addition, any assessment of the likelihood of the particular beneficial uses of groundwater being realised should be based on an evaluation of whether an owner/occupier of the site (or in the vicinity of the site) may reasonably expect to use or be able to use groundwater for the above purposes. This assessment should have regard for both existing and future land use.

The groundwater quality indicators and objectives for the protected beneficial uses (with the exception of potable mineral water supply) are shown in Table 13 below.

Table 13 Groundwater Quality Indicators and Objectives (SEPP, GoV)

Beneficial Use	Indicator	Objective
Maintenance of ecosystems	Those specified in the relevant SEPP for surface waters.	Groundwater shall not cause receiving waters to be affected to the extent that the level of any water quality indicator is greater than the level of that indicator specified in the relevant SEPP for surface waters.
Irrigation	Those specified for irrigation in the Australian Water Quality Guidelines for Fresh and Marine Waters.	Groundwater shall not be affected to the extent that the level of any water quality indicator is greater than the level of that indicator specified for irrigation in the Australian Water Quality Guidelines for Fresh and Marine Waters.
Stock watering	Those specified for livestock in the Australian Water Quality Guidelines for Fresh and Marine Waters.	Groundwater shall not be affected to the extent that the level of any water quality indicator is greater than the level of that indicator specified for livestock in the Australian Water Quality Guidelines for Fresh and Marine Waters.
Industrial water use	Those specified for industrial use in the Australian Water Quality Guidelines for Fresh and Marine Waters.	Groundwater shall not be affected to the extent that the level of any water quality indicator is greater than the level of that indicator specified for industrial water quality in the Australian Water Quality Guidelines for Fresh and Marine Waters.
Primary contact recreation (e.g. bathing, swimming)	Those specified for primary contact recreation in the Australian Water Quality Guidelines for Fresh and Marine Waters.	Groundwater shall not be affected to the extent that the level of any water quality indicator is greater than the level of that indicator specified for primary contact recreation in the Australian Water Quality Guidelines for Fresh and Marine Waters.
Buildings and structures	pH, Sulphate, Redox potential	Introduced contaminants shall not cause groundwater to become corrosive to structures or building materials.

7.3.1 Maintenance of ecosystems

The Auditor agrees with the Assessor that Moonee Ponds Creek is the nearest down-gradient surface water body (2 km south-west of the site). Moonee Ponds Creek is a tributary to the Yarra River. As a result the Variation of the SEPP (Waters of Victoria) – insertion of Schedule F7 – Waters of the Yarra Catchment applies to determine ecological protection guidelines. The section of Moonee Ponds Creek is considered to be the point of discharge for groundwater beneath the site is part of the Urban Waterways segment of the catchment. The Urban Waterways segment is defined in Schedule F7 as being a modified ecosystem.

For the maintenance of ecosystems beneficial use, the Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (2000) National Water Quality Management Strategy - Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) is referred to. The 95% protection level trigger values for fresh water from ANZECC 2000 have been used.

The Environmental Auditor also notes that in the absence of IL for certain organic compounds in Table 3.4.1 of ANZECC 2000, the 'low reliability' trigger levels specified in Volume 2 (Section 8.3) should be used. It should be noted that 'low reliability' indicates that when the dataset was smaller than that required by the method, or if data obtained did not satisfy requirements for completeness of information on test parameters, tentative or 'low reliability' guidelines were derived in the interim (rather than having no working figures at all). ANZECC 2000 states that 'low reliability' trigger values should be used as indicative interim working levels and are conservative values. For nitrate, the Auditor has referred to Hickey (2013) *Updating nitrate toxicity effects on freshwater aquatic species* as the nitrate trigger values in ANZECC 2000 were removed and replaced with 'under review' in the errata.

7.3.2 Potable mineral water supply

The site is not within a designated mineral spring area and the protection of this beneficial use is not considered further in this audit report.

7.3.3 Agriculture, parks and gardens

This beneficial use relates to the extraction of groundwater for provision of irrigation water for agriculture, parks and gardens.

The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. Section 4.2 of ANZECC 2000 has been referred to.

7.3.4 Stock watering

This beneficial use relates to the extraction of groundwater for provision of drinking water for livestock.

The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. Where Section 4.3 of ANZECC 2000 does not specify IL for this beneficial use - Table 5.10 in ANZECC 1992 can be used.

Where neither ANZECC 1992 or ANZECC 2000 specify IL, the *Australian Drinking Water Guidelines 2011* can be referred to in the first instance. WHO (2011) may be referred to where no ILs are specified in the Australian Drinking Water Guidelines (ADWG). For organic chemicals, the USEPA Regional Screening Levels for tap water may also be considered.

7.3.5 Industrial water use

This beneficial use relates to the extraction of groundwater for use in industrial processes.

The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. ANZECC 2000 does not specify IL for this beneficial use – IL for industrial water use are specified in Chapter Six of ANZECC 1992.

ANZECC 1992 specifies the types of industry that may extract groundwater as: generic processes (heating and cooling); textile, chemical and allied, food and beverage, iron and steel, tanning and leather, pulp and paper; and the petroleum industry. TDS is the main water quality indicator for specific industrial uses of extracted groundwater.

Due to the wide range of potential uses, the Assessor has not defined IL for this beneficial use.

7.3.6 Primary contact recreation

This beneficial use relates to the extraction of groundwater to (for example) fill swimming pools (or where groundwater is recharging a surface water body used for swimming).

The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. Table 5.2.3 and 5.2.4 of ANZECC 2000 specify IL for this beneficial use. In the absence of IL for particular COPC, Table 4.1 of ANZECC 1992 can be used.

The Auditor notes that the NEPM 2013 Amendment refers to the *Guidelines for Managing Risks in Recreational Water 2008* (GMRRW). The GMRRW provides ILs for both aesthetic and health considerations based on drinking water quality. The ILs are drinking water guidelines from the ADWG. The drinking water guidelines are based on a daily consumption of 2 L, thus for exposure through primary contact recreation the health ILs may be adjusted by a multiplication factor of 10 to 20 to account for consumption of 100 to 200 mL of water per day. Where no health ILs are specified in the GMRRW, WHO (2011) may be referred to. For organic chemicals, the USEPA Regional Screening Levels for tap water may also be considered.

7.3.7 Buildings and structures

This beneficial use relates to groundwater and the footings of buildings and structures. The SEPP (GoV) specifies that introduced COPC shall not cause groundwater to become corrosive to structures or building materials.

Investigation levels from Table 6.4.2(C) of AS2159 may be used to assess the severity of sulfate, chloride and pH on concrete structures.

7.3.8 Further considerations

A protected beneficial use may not apply at a site where background concentrations of a substance are greater than the relevant guideline. Therefore, if contamination is expected, it is important to determine or consider the concentrations of substances which occur naturally in groundwater in the region of the site.

Schedule B1 of the NEPM Amendment also provides HSLs for selected petroleum compounds and fractions for human health via the inhalation pathway in the case of vapour intrusion from groundwater. These criteria are not applicable for groundwater within fractured rock.

An investigation of groundwater quality was not required to be conducted by the Auditor. Please refer to Section 8.4 for further detail regarding the decision to omit an investigation of groundwater quality.

7.4 Surface Water

The Auditor does not consider that the Audit site will affect any surface waters near the site for the following reasons:

- the land surface is relatively flat and therefore limited surface water run-off is expected;
- there are no surface water bodies at the site; and
- the closest down-gradient surface water body, Moonee Ponds Creek, is located approximately 2 km west of the site.

7.5 Air

Indicators and objectives for air quality are discussed in *State Environment Protection Policy (Ambient Air Quality)* and *State Environment Protection Policy (Air Quality Management).*

A detailed assessment of air quality is not considered necessary for the site. The site soils are not impacted with respect to volatile chemicals. No direct soil vapour measurements were collected.

8.0 Environmental Audit Findings

This section summarises the Auditor's assessment of the significance of the levels of contaminant indicators reported at the site by the Assessor.

8.1 Summary of Soil Contamination Status

8.1.1 Field findings

This Environmental Audit has been prepared and issued with the site in the following state:

- The brick building/warehouse remains at the site;
- Concrete surface cover is present across the site;
- The condition of the fill material has been tested and evaluated by the Assessor; and
- The condition of the natural soil has been tested and evaluated by the Assessor.

8.1.2 Site decommissioning and remediation

The Brunswick Tool Library has occupied the site since 2012. No remediation works have been undertaken. The Auditor notes the following:

- From 1968 to 2007 the site was used for clothing manufacture. The manufacturing operations comprised cutting and sewing of fabrics. From 2007 to 2012 the site was used as an art studio.
- Site inspections have not identified the presence of any tanks, pit, sumps or infrastructure associated with potentially contaminating activities. No activities undertaken by the tenants are considered likely to have resulted in contamination of land or groundwater.

8.1.3 Laboratory analytical results findings

The analytical results for soil sampling conducted by the Assessor have been compared with the environmental quality objectives adopted for the purpose of this Environmental Audit. Alpha has included laboratory transcripts within its report, tabulated these into summary tables and shown sampling locations on a plan.

The Auditor has also tabulated analytical data for chemicals of interest (refer to Table 17 of Appendix C). All soil samples analysed are representative of the final condition of the land.

The following provides a discussion of the final condition of soil at the site. Concentrations of all COPC were below the ILs. Discussion regarding risks to the beneficial uses of land is provided in Section 8.3.

Heavy metals: 10 primary samples were analysed for a standard suite of heavy metals. Two of the samples were also analysed for beryllium, boron, chromium (VI), manganese and selenium.

Arsenic:	Concentrations ranged from below the LOR (2 mg/kg) to 4.1 mg/kg. The maximum concentration was reported for QC01 (intra-laboratory duplicate sample of SB01/0.2). No concentrations exceed the adopted ILs.
Chromium:	Concentrations ranged from below the LOR (5 mg/kg) to 49 mg/kg (SB03/0.5). Hexavalent chromium was not detected in any of the samples analysed. Chromium concentrations were higher in the natural soils than in the fill material and are considered to represent background levels. No concentrations exceed the adopted ILs.
Copper:	Concentrations ranged from below the LOR (5 mg/kg) to 66 mg/kg (SB04/0.5). No concentrations exceed the adopted ILs.
Lead:	Lead was detected in all but one of the 10 primary samples of soil analysed. The highest concentration reported was 190 mg/kg in fill material sample QC01. No concentrations exceed the adopted ILs.
Nickel:	Concentrations ranged from below the LOR (5 mg/kg) to 30 mg/kg (SB01/1.0). No concentrations exceed the adopted ILs.

Zinc: The highest zinc concentration reported was 240 mg/kg in QC01. No concentrations exceed the adopted ILs.

Beryllium, boron, mercury and selenium were not detected in any of the samples.

TPH/TRH: Eight primary samples were analysed for TPH/TRH compounds. The Auditor notes that:

- >C10-C14 range hydrocarbons were detected in one sample at a concentration marginally above the LOR (QC01, 26 mg/kg). >C10-C16 hydrocarbons were below the LOR (50 mg/kg).

pH: One sample of fill material and one sample of natural soil were tested for pH. Both samples were of neutral pH.

Cyanide, BTEX, PAHs, pesticides, herbicides and polychlorinated biphenyls were not detected in any of the samples analysed.

8.1.4 Statistical findings

A statistical assessment was not undertaken as all concentrations were below the ILs and because of the overall small number of samples. This is considered acceptable by the Auditor.

8.1.5 Leachability results

No samples were subject to leachability testing as concentrations of COPC were below the adopted ILs.

8.1.6 Asbestos

Asbestos was not observed in soil during the intrusive investigation works. It is noted that the Assessor observed that the warehouse roof (and potentially other building materials within the warehouse) comprises asbestos containing material (ACM). Prior to demolition the removal of asbestos shall be undertaken in accordance with the appropriate regulations, codes and guidance so that the condition of land is not impacted by this material.

8.2 Summary of Groundwater Contamination Status

As discussed previously, a groundwater investigation at the site was not undertaken. The Assessor considered, and the Auditor agrees, that it is unlikely the Audit site will affect groundwater beneath the site.

The review of surrounding environmental audit reports (Section 2.8.1) found that elevated concentrations of nitrate had been reported at multiple audit sites. The Auditor considers that groundwater beneath this audit site may be impacted by diffuse off-site sources of nitrate.

The Auditor has completed the Environmental Audit under the assumption that groundwater beneath the site is polluted. This is discussed further in Section 8.4.

8.3 Risk to Beneficial Uses of Land

In order to issue the site with a CoEA, the Auditor must be satisfied that the site is suitable for any future land use. In re-iteration, the condition of the site must be assessed against the criteria established for any land uses (including the most sensitive). These land uses are as follows:

- parks and reserves;
- agriculture;
- sensitive use (high density);
- sensitive use (other – including medium and low density residential, child care centres, pre-schools or primary schools);
- recreational/open spaces;
- commercial; and
- industrial.

The relevant beneficial uses of land for any land use are as follows:

- maintenance of ecosystems (natural, modified and highly modified);
- human health;
- buildings and structures;
- aesthetics; and
- production of food, flora, and fibre.

A review of the condition of the land (at the time of the completion of the Environmental Audit) with respect to these beneficial uses is presented below.

8.3.1 Maintenance of Ecosystems

With respect to the maintenance of ecosystems, the Auditor is of the opinion that natural and modified ecosystems do not exist at the site. The site surface is sealed and vegetation (other than minor low lying weeds either side of the driveway) was not observed at the site, however, highly modified ecosystems could exist (such as earthworms or other terrestrial organisms).

Concentrations of COPC in all soil samples were below the adopted ILs.

The Auditor is of the opinion that the beneficial use – maintenance of ecosystems (natural, modified and highly modified ecosystems) – is protected at the site.

8.3.2 Human Health

Based on the analytical data and discussion provided by the Assessor, the Auditor is of the opinion that the beneficial use – human health – is protected for all land use scenarios.

8.3.3 Buildings and Structures

Based on soil pH concentrations reported by the Assessor (being within the range expected and not exceeding quality objectives), and the site is not located in an area with high potential of acid sulfate soil, the beneficial use – buildings and structures – is protected at the site under all land use scenarios (including the most sensitive use).

8.3.4 Aesthetics

No debris, odour or staining was noted in the fill material and underlying natural soil by the Assessor. On this basis, the Auditor concludes that the beneficial use – aesthetics – is protected.

8.3.5 Production of Food, Flora and Fibre

While no specific criteria for the quality and yield of food, flora and fibre crops have been adopted, a consideration of this beneficial use is made in terms of the NEPM 2013 ecological investigation and screening levels. As was noted above, all concentrations were below the EILs and ESLs.

It is noted that the final land surface does not contain any top-soil and therefore will have a low organic content. Subsequently, without amelioration, the quality and yield of food, flora and fibre crops will be affected. However, the evaluation of the protection of this beneficial use must consider whether or not "contamination of land... affects produce quality or yield" (SEPP (PMCL)). The Auditor is of the opinion that the site is not contaminated.

On the basis of the above, the Auditor is of the opinion that the beneficial use – production of food, flora and fibre – is protected.

8.4 Risk to Beneficial Uses of Groundwater

Groundwater beneath the site is classified as Segment B in accordance with SEPP (GoV). The beneficial uses associated with Segment B are:

- maintenance of ecosystems;
- potable mineral water supply;
- agriculture, parks and gardens;
- stock watering;

- industrial water use;
- primary contact recreation; and
- buildings and structures.

In accordance with SEPP (GoV) and the Auditing Guidelines (EPA Publication 759.2) an Auditor must have regard to the "beneficial uses that may be made of the relevant segment of the environment". An Auditor must take into account that polluted groundwater at a site may affect the ability to issue a Certificate of Environmental Audit. In order to assess the groundwater component of the audit process, three questions need to be answered:

a) is groundwater likely to be polluted?

b) if yes to (a), is groundwater polluted?

c) if yes to (b), are the beneficial uses of the groundwater precluded by the pollution relevant or, is the site the source of pollution?

Is groundwater likely to be polluted from previous or current on-site activities?

Given the history, geology and the analytical results from the assessment, the potential for contamination of groundwater by the site is considered low. Evidence to support this includes the following:

- analytical results for the fill material and natural soils beneath the fill material were below the adopted ILs;
- natural soils are low permeability clays;
- no underground tanks have been observed at the site; and
- the site history did not otherwise indicate the potential for high risk contaminating activities which may have caused groundwater to be polluted.

Is groundwater likely to be polluted from previous or current off-site activities?

Based on the results of the review of surrounding audit sites, groundwater in the vicinity of the site is impacted by diffuse sources of nitrate. The site is not considered to be a source site for pollution.

Section 13.2 if the Auditing Guidelines states the following:

"Where the audit site is not the source site of the groundwater pollution and the potentially affected beneficial uses are not relevant there may be no need to investigate groundwater quality. An exemption from such an investigation may be granted where:

a) groundwater is likely to be polluted, but the site is not a source of groundwater pollution

b) the beneficial uses of groundwater are not likely to occur at the site

c) any pollution of groundwater would not affect any other beneficial use of the site."

With respect to a) above, the Auditor is of the opinion that groundwater is likely to be polluted by diffuse source nitrate and that the site is not likely to be the source of groundwater pollution.

With respect to b) above, the Auditor makes the following considerations regarding groundwater beneficial uses:

- maintenance of ecosystems is not an existing or likely beneficial use at the site;
- potable mineral water supply is not an existing or likely beneficial use at the site;
- agriculture, parks and gardens is not an existing or likely beneficial use at the site;
- stock watering is not an existing or likely beneficial use at the site;
- industrial water use is not an existing or likely beneficial use at the site;
- primary contact recreation is not an existing or likely beneficial use at the site;
- buildings and structures is not an existing or likely beneficial use at the site. Groundwater is likely to be present at a depth of 10 to 15 m bgl and is unlikely to be intercepted by underground structures.

With respect to c) above, based on the likely contaminant (nitrate), pollution of groundwater is not likely to affect the beneficial uses of land.

Is a CUTEP determination required?

Where polluted groundwater is established at a site, and it is not practicable to clean up groundwater to protect the beneficial uses, cleanup must be undertaken to the extent practicable in accordance with the SEPP (Groundwaters of Victoria), and a CUTEP determination must be made (EPA 759.2, Section 13.6).

A CUTEP determination is required for the site as groundwater is assumed to be polluted by nitrate. Following the guidance provided in EPA Publication 759.2, as the site is not a source site the determination of CUTEP can be made by the Environmental Auditor. The CUTEP determination for the site is provided in Section 9.0. An evaluation of the risks to the protected beneficial uses of groundwater at the site from the diffuse source nitrate pollution is provided below.

8.4.1 Maintenance of Ecosystems

Nitrate concentrations of up to 68 mg/L were reported in groundwater at the 37-43 Breese Street audit site. This exceeds the grading value of 2.4 mg/L from Hickey (2013).

Groundwater beneath the site is expected to discharge to Moonee Ponds Creek approximately 2 km south-west of the site. It is possible that varying recharge and redox conditions could attenuate the nitrate pollution present in the vicinity of the site (via dilution and denitrification) before discharge to Moonee Ponds Creek. However, as regional groundwater pollution is assumed to be present, it is assumed that diffuse sources of nitrate also exist downgradient of the site. The Auditor notes that nitrate has been reported at concentrations exceeding the adopted criterion at downgradient audit sites such as 1 Heller Street, Brunswick (CARMS 62070-1) and Part of Lot S, Former Hoffman Brickworks (CARMS 51415-4) which are more than 1 km south-west of the site.

The beneficial use, maintenance of ecosystems, is assumed to be precluded at the point of discharge due to regional nitrate pollution.

8.4.2 Agriculture, Parks and Gardens

The maximum nitrate concentration reported in groundwater at the 37-43 Breese Street audit site exceeds the ANZECC 2000 irrigation screening level for total nitrogen of 5 mg/L (long term) and 25 mg/L (short term).

Bores licensed for domestic use exist more than 1 km from the site.

The beneficial use, agriculture, parks and gardens is considered to be precluded at the site.

8.4.3 Stock Watering

The maximum nitrate concentration reported for the 37-43 Breese Street audit site does not exceed the ANZECC 2000 stock watering screening level of 90.3 mg/L (nitrate as N).

Bores licensed for domestic and stock use exist more than 1 km from the site.

The beneficial use, stock watering, is considered to be protected at the site.

8.4.4 Industrial Water Use

The Auditor has not provided a specific industrial water use screening level for nitrate due to the various types of industry that might extract groundwater and the varying requirements of water quality. The Auditor considers that as maximum nitrate concentration the 37-43 Breese Street audit site does not exceed the relevant criteria for stock watering and primary contact recreation, industrial water use is not precluded.

Bores licensed for industrial use do not exist in the vicinity of the site, nor are they likely.

The beneficial use, industrial water use, is considered to be a protected beneficial use at the site.

8.4.5 Primary Contact Recreation

The maximum nitrate concentration reported for the 37-43 Breese Street audit site does not exceed the NHMRC 2008 health screening level of 113 mg/L (nitrate as N).

Bores licensed for domestic use exist more than 1 km from the site.

The beneficial use, primary contact recreation, is considered to be a protected beneficial use at the site.

8.4.6 Buildings and Structures

Nitrate is not considered to be a chemical that would pose a risk to buildings and structures.

The beneficial use, buildings and structures, is considered to be protected at the site.

8.5 Risk to Beneficial Uses of Surface Water

As was stated previously, there are no on-site surface water bodies and no extractive groundwater bores for filling surface water bodies; and none are likely as part of any new development on the site. The nearest surface water receptor of groundwater beneath the site is Moonee Ponds Creek which is located 2 km west of the site at the closest point.

There is diffuse source nitrate pollution in the vicinity of the site with concentrations exceeding the adopted screening level for maintenance of ecosystems. The site is not the source of the regional nitrate pollution. Diffuse sources of nitrate are also assumed to be present downgradient of the site. The Audit site itself is not considered to be affecting Moonee Ponds Creek.

As such, the protection of this environmental aspect has not been considered further by the Auditor.

8.6 Risk to Beneficial Uses of Air

The soil assessment does not indicate that there is contamination at the site that would preclude the beneficial uses of air. As such, the protection of this environmental aspect has not been considered further by the Auditor.

8.7 Imminent Environmental Hazard

The Auditor is not aware of any condition of land or groundwater within or associated with the site which may represent an imminent environmental hazard.

9.0 Clean-up to the Extent Practicable

This Auditor-determined CUTEP has been prepared in general accordance with EPA Publication 840. For ease of evaluation, a copy of the CUTEP checklist is provided in Table 14. This CUTEP addresses assumed diffuse source nitrate pollution only.

As no soil contamination has been identified and a direct groundwater investigation has not been undertaken at the site, the following information listed in the CUTEP checklist has not been included in this report (marked with notes in Table 14):

- Water quality summary tables;
- Groundwater and soil contamination maps; and
- Hydrogeological cross-section.

Table 14 CUTEP Checklist

Information included		Section/Page discussed	Please tick off
Title details		2.1	✓
Land area		2.1	✓
Past use		2.9	✓
Surrounding land use (North, South, East and West)		2.3	✓
Proposed future use		2.2	✓
Geology		2.6	✓
Groundwater depth (m)		2.7.2	✓
Groundwater flow direction		2.7.1	✓
Nearest surface water receptor (distance & direction)		2.7.1	✓
Bore search (2 km radius)		2.7.4	✓
Groundwater segment (note – most conservative segment should be used)		2.7.3	✓
Beneficial uses of groundwater identified		2.7.3	✓
Precluded beneficial uses of groundwater identified		8.4	✓
Remediation options table	Discussion of specific options	9.4	✓
	Cost	9.4	✓
	Technical feasibility	9.4	✓
	Logistical feasibility	9.4	✓
Vapour risk considered		9.3	✓
GQMP	Responsible party identified	10.0	NA
	Cost – establishment and annual	10.0	NA
	Duration	10.0	NA
Water quality summary table showing results from all rounds of monitoring (ug/L)		NA[1]	NA

Information included	Section/Page discussed	Please tick off
Separate table showing latest water quality results that are above guidelines (ug/L) as per attached table (as a hard- and soft-copy)	NA[1]	NA
An opinion on the source of all contaminants over criteria in the groundwater (e.g. on-site source, off-site source, co-source)	8.4 and 9.1	✓
Groundwater and soil contamination maps	NA[2]	NA
Hydrogeological cross-section(s) of site showing (as a minimum) geology, groundwater levels, groundwater bores and any relevant features (e.g. USTs, excavations, utility services, building structures, etc).	NA[3]	NA
Discussion of proposed GQRUZ (if applicable). This should include sufficient information to identify it and an associated figure.	10.0	NA
Details and records of communications with off-site property owners associated with the GQRUZ (if applicable).	-	NA
Any other issues of significance (e.g. Enforcement Notice, Significant Public Interest)	-	-
A clear and concise executive summary providing all of the above information	Executive Summary	✓

NA – not applicable

[1] Not applicable as a groundwater investigation has not been undertaken at the site and groundwater data has not been collected. The groundwater pollution assumed to be present beneath the site is from diffuse sources and is therefore assumed to be present beneath the entire site.

[2] Not applicable as no soil contamination has been identified during the soil investigation and a groundwater investigation has not been undertaken at the site. The soil analytical results are also not relevant to the assumed groundwater pollution.

[3] A hydrogeological cross-section has not been prepared as a groundwater investigation has not been undertaken (i.e. groundwater levels and geology below the 1 m maximum depth of the soil investigation would be estimated). The cross-section is not considered to be of significant value without site-specific data.

9.1 Groundwater Pollution "source site" Evaluation

In accordance with s13 of EPA Publication 759.2, the Auditor must determine whether the site is likely to be polluted and whether or not the site is the likely source of groundwater pollution. The Auditor is of the opinion that the site is unlikely to be a source of groundwater impacts based on the following:

- analytical results for the fill material and natural soils beneath the fill material were below the adopted ILs;
- natural soils are low permeability clays;
- no underground tanks have been observed at the site; and
- the site history did not otherwise indicate the potential for high risk contaminating activities which may have caused groundwater to be polluted.

As the site is not a source or potential source of groundwater pollution, a groundwater investigation was not required by the Auditor.

Based on the results of the review of surrounding audit sites, groundwater in the vicinity of the site is impacted by diffuse sources of nitrate. Nitrate pollution was identified at 37-43 Breese Street, Brunswick (CARMS 72363-1), which is the neighbouring property across Breese Street to the west of the site. Nitrate concentrations of up to 68 mg/L were reported at that audit site. The site Auditor considered that there was a diffuse source of nitrate contamination (i.e. leaking sewers).

Groundwater beneath the site is assumed to be polluted by diffuse sources of nitrate. The site is not considered a source site for pollution.

9.2 Protected Beneficial Uses Precluded by Polluted Groundwater

The protected beneficial uses considered by the Auditor to be precluded by pollution (and a note with respect to relevance) are summarised in Table 15. The risks to the beneficial uses of groundwater are discussed in detail in Section 8.4.

Table 15 Groundwater quality objectives and protected beneficial uses (Segment B) precluded by polluted groundwater

Beneficial Use	Objectives	Note with respect to protection	Note with respect to use & relevance
Maintenance of Ecosystems	ANZECC (2000) – Australian Water Quality Guidelines (AWQG) 95% level of protection (Freshwater)	Precluded (refer 8.4.1)	Groundwater is expected to discharge to Moonee Ponds Creek ~2.0 km south-west of the site
Potable Mineral Water Supply	Not applicable: Not in a designated mineral spring area and does not display effervescence.		
Agriculture, Parks & Gardens	ANZECC (2000) – AWQG – Water quality for irrigation	Precluded (refer 8.4.2)	Not existing on-site. Is existing in vicinity (bores licensed for domestic use).
Stock Watering	ANZECC (2000) – AWQG – Livestock Drinking Water Quality.	Protected (refer 8.4.3)	Not existing on-site. Is existing in vicinity.
Industrial Water Use	NA – Other quality objectives considered sufficient to be protective for this beneficial use.	Protected (refer 8.4.4)	Not existing on-site or in vicinity.
Primary Contact Recreation	NHMRC (2008) – Guidelines for managing risks in recreational water	Protected (refer 8.4.5)	Not existing on-site. Is existing in vicinity (bores licensed for domestic use).
Buildings & Structures	AS2159	Protected (refer 0)	Relevant

The groundwater contaminants that preclude the protected beneficial uses are summarised in Table 16 below.

Table 16 Protected Beneficial Uses Precluded By Pollution

Protected Beneficial Use	Groundwater Contaminant(s)
Maintenance of ecosystems	Nitrate (r)
Potable mineral water supply	NA
Agriculture, parks and gardens	Nitrate (r)
Stock watering	NE
Industrial water use	NE
Primary contact recreation	NE
Buildings and structures	NE

Notes:
(n) – naturally occurring
(r) – regional pollution
NA – not applicable
NE – no exceedance

9.3 Does a Vapour Risk Exist?

Nitrate is an aqueous ion. Nitrate can be converted to gaseous forms such as nitric oxide, nitrous oxide and finally nitrogen gas via denitrification. Nitrate in itself is not considered to pose a vapour risk.

9.4 Remediation Options and Significance of Pollution

The remediation of the diffuse sources of nitrate pollution would be costly, technically difficult and logistically complicated to achieve. Furthermore, the site is not the source of the pollution and remediation of the off-site diffuse sources is not the responsibility of the owner of the audit site.

There are technical solutions (such as permeable reactive barriers and cut-off walls) that could restore the beneficial use of agriculture, parks and gardens at the site. However, this would be logistically difficult (for example would require demolition of the building and excavation along the site boundaries), costly and would require long-term management as diffuse sources of contamination would remain upgradient of the site. Remediation of groundwater at the site would not restore the beneficial use of maintenance of ecosystems, as this is assumed to be precluded by downgradient diffuse sources of nitrate.

As a result, the Auditor is of the opinion that clean-up of groundwater at the site is not commensurate with the significance of the environmental issues being addressed.

9.5 CUTEP Determination by Auditor

On the basis of the information provided within this audit report, the Auditor concludes that:

- groundwater is likely to be polluted by nitrate;
- the site is not the source (or likely source) of groundwater pollution;
- remediation of groundwater at the site would not restore the beneficial use of maintenance of ecosystems;
- the groundwater beneficial uses precluded by contamination are not relevant at the site;
- groundwater pollution does not affect the beneficial uses of land; and
- access to the site is not required to effect practical clean-up options to protect surface water.

The Auditor has determined that groundwater has been cleaned up to the extent practicable.

10.0 On-going Management of Polluted Groundwater

Section 7 of EPA Publication 840.1 relates to the on-going management of polluted groundwater. In particular, there is a requirement for periodic review of the practicability of groundwater clean-up (to meet the objectives of SEPP (GoV)).

10.1 On-going Monitoring

There is no groundwater well monitoring network at the site. No groundwater monitoring is proposed to be undertaken.

10.2 Management of Polluted Groundwater

The following management strategies are proposed:

- The Auditor has included in 'other related information' of the Certificate of Environmental Audit:
    - Groundwater at the site is assumed to be polluted such that certain beneficial uses permitted under the SEPP (Groundwaters of Victoria) are precluded. The site is not the source of the pollution and the pollution is considered not to affect any relevant beneficial uses of the site. The precluded beneficial uses include maintenance of ecosystems and agriculture, parks and gardens. The beneficial use of stock watering, industrial water use, primary contact recreation and building and structures are considered to be protected beneficial use of groundwater;
    - The auditor has determined that groundwater has been cleaned up to the extent practicable;
    - In accordance with Clause 19(3) of the SEPP (Groundwaters of Victoria) the Authority may require periodic reassessment of the practicability of groundwater clean-up;
    - No groundwater investigation has been undertaken at the site. Any person proposing to extract groundwater from beneath the site in the future should engage a suitably qualified professional to complete a groundwater investigation (to assess its suitability for a specific use);

As groundwater has not been tested, the Auditor does not propose that a GQRUZ is applied to the site.

11.0 Environmental Auditor Conclusions

The Auditor's conclusions on the findings of the Environmental Audit are presented below.

11.1 Environmental Audit Outcome

On the basis of:

- the site history;
- the geology and inferred hydrogeology of the site;
- the distribution and frequency of sampling locations to obtain a valued judgement of the contamination status of the site;
- the soil sampling procedures suitable to produce accurate results;
- the analytical suite sufficient to identify a broad spectrum of likely contaminants;
- the accuracy and reproducibility of results verified via quality control sampling;
- the discussions with the client and Assessor;
- the Auditor's site inspection;
- the results of the assessment;
- the EPA Auditor Guidelines and the relevant EPA policies; and
- the NEPM, Australian Standards and other relevant publications,

The Auditor is of the opinion that:

- the beneficial uses of land are protected;
- the site is not a source site for pollution;
- groundwater beneath the site is assumed to be polluted;
- the groundwater beneficial uses precluded by contamination are not relevant at the site;
- groundwater pollution does not affect the beneficial uses of land; and
- access to the site is not required to effect practical clean-up options to protect surface water.

The Auditor concludes that the site is suitable for the issue of a Certificate of Environmental Audit (CoEA). A copy of the CoEA is attached to the Executive Summary at the start of this Environmental Audit Report. The CoEA states that the site is suitable for any beneficial use.

11.1.1 Other related information

Other related information detailed in the CoEA for the site includes the following:

- Groundwater at the site is assumed to be polluted such that certain beneficial uses permitted under the SEPP (Groundwaters of Victoria) are precluded. The site is not the source of the pollution and the pollution is considered not to affect any relevant beneficial uses of the site. The precluded beneficial uses include maintenance of ecosystems and agriculture, parks and gardens. The beneficial use of stock watering, industrial water use, primary contact recreation and building and structures are considered to be protected beneficial use of groundwater;
- The auditor has determined that groundwater has been cleaned up to the extent practicable;
- In accordance with Clause 19(3) of the SEPP (Groundwaters of Victoria) the Authority may require periodic reassessment of the practicability of groundwater clean-up;
- No groundwater investigation has been undertaken at the site. Any person proposing to extract groundwater from beneath the site in the future should engage a suitably qualified professional to complete a groundwater investigation (to assess its suitability for a specific use); and
- Any soil that is proposed to be removed from the site after the completion of the Environmental Audit must be tested and disposed of in accordance with IWRG621 and to statutory requirements (or replacement publication/s). Also, any soil that is proposed to be imported onto the site must be classified "Fill Material" prior to use onsite (in accordance with IWRG621 or replacement publication/s).

12.0 Environmental Audit Limitations

This audit report has been prepared for the Client in accordance with Part IXD of the *Environment Protection Act 1970*.

In forming opinions stated in this report, the Auditor has relied on information described in assessment reports supplied by the Client, their assessors and other third parties (**Assessment Reports**) and upon Site inspections conducted by the Auditor and/or his representatives. The Auditor has undertaken desktop checks consistent with the standard of care expected of environmental auditors to make and assessment of the likely accuracy of the information described in Assessment Reports.

Except where expressly stated otherwise in this report the Assessment Reports have been taken to represent a fair and reasonable characterization of the Site. Despite the best efforts of the Auditor, the Auditor cannot be responsible for opinions based on Assessment Reports supplied by the Client or their Assessors which are later found to be false or misleading.

The Environmental Audit in no way implies the site will be free from contamination after development but only that exposure of contamination to the environment or from activities on the site as a whole will not cause adverse impact if used for the proposed purpose on the conditions and in the manner specified in this report..

The Auditor notes site contamination exhibits characteristics and properties which vary from place to place and can change with time. Contamination audits involve gathering and assimilating limited facts about these characteristics and properties in order to better understand the status of contamination on a particular site under certain conditions at a point in time. The facts reported and utilised in this audit report may have been obtained by inspection or from Assessment Reports prepared by persons other than the Auditor and are directly relevant only to the soil or groundwater at the place where and time when the investigations were carried out.

This Environmental Audit does not conclude that all material remaining onsite, if excavated, will be meet any particular hazard classification for offsite disposal (in accordance with IWRG621 or replacement publication). The site has been investigated on a systematic and targeted basis and validated statistically. The Auditor cannot and does not warrant or represent that locations between the sampling points are not contaminated, but rather, the Site statistically, as a whole, is fit for the proposed use on the conditions and in the manner specified in this report.

The Auditor does not make any comment regarding the geotechnical suitability of the site for the proposed use.

The Auditor is not responsible for any change in state of the site after the date of the Environmental Audit Report, or for the compliance by site owners with any laws or regulations relating to demolition and waste disposal.

13.0 References

General references:

Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (1992) *Guidelines for Assessment and Management of Contaminated Sites*

Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (1992) *National Water Quality Management Strategy - Australian Water Quality Guidelines for Fresh and Marine Waters*

Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (2000) *National Water Quality Management Strategy - Australian and New Zealand Guidelines for Fresh and Marine Water Quality*

Australian Food Standards Code (1987) *Standard 08 Mineral Water*

Canadian Council of Ministers of the Environment (January 2008) *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil*

Department of Conservation and Natural Resources (1995) *Groundwater Resources Victoria South West Victoria Water Table Aquifers - Victorian Groundwater Beneficial Uses Map 1:1,000,000 Map Sheet*

Environment Protection Act 1970

Environment Protection Authority of Victoria (April 2000) *Publication 669 – Groundwater Sampling Guidelines*

Environment Protection Authority of Victoria (September 2007) *Publication 759.1 - Environmental Auditor (Contaminated Land) Guidelines for Issue of Certificates and Statements of Environmental Audit*

Environment Protection Authority of Victoria (September 2007) *Publication 759.2 - Environmental Auditor (Contaminated Land) Guidelines for Issue of Certificates and Statements of Environmental Audit*

Environment Protection Authority of Victoria (December 2012) *Publication 1147.1 - Environmental Auditor Guidelines – Provision of Environmental Audit Reports, Certificates and Statements*

Environment Protection Authority of Victoria (June 2009) *Industrial Waste Resource Guideline 621 – Soil Hazard Categorisation and Management*

Environment Protection Authority of Victoria (June 2009) *Industrial Waste Resource Guideline 702 - Soil Sampling*

Environment Protection (Industrial Waste Resource) Regulations 2009

Friebel, E and Nadebaum, P (September 2011) *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater*, CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide Australia

Hickey, C.W. (2013) *Updating nitrate toxicity effects on freshwater aquatic species,* National Institute of Water and Atmospheric Research Ltd

Leonard, J. G. (2006) *Hydrogeology of the Melbourne Area*, Australian Geomechanics Vol 41 No 3

Minister for Planning (27 September 2001) *Direction No. 1 - Planning and Environment Act 1987 Section 12 (2) (a) of the - Potentially Contaminated Land*

National Environment Protection Council (1999) *National Environment Protection (Assessment of Site Contamination) Measure*

National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure No. 1*

National Health and Medical Research Council (2008) *Guidelines for Managing Risks in Recreational Waters*

National Health and Medical Research Council and the National Resource Management Ministerial Council (2011) *National Water Quality Management Strategy - Australian Drinking Water Guidelines 6 (v3.1 updated 2015)*

National Uniform Drillers Licensing Committee (February 2012) *Minimum Construction Requirements for Water Bores in Australia – Edition 3*

Standards Australia (2009) *Australian Standard AS2159 - Piling-Design and Installation*

Standards Australia (2005) *Australian Standard AS4482.1 - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-volatile and Semi-Volatile Compounds*

United States Environmental Protection Agency (as amended from time to time) *Regional Screening Levels*

United States Environmental Protection Agency (as amended from time to time) *Ecological Soil Screening Levels*

Victorian Government (December 1997) *State Environment Protection Policy - Groundwaters of Victoria*

Victorian Government (February 1999) *State Environment Protection Policy – Ambient Air Quality*

Victorian Government (December 2001) *State Environment Protection Policy – Air Quality Management*

Victorian Government (June 2002) *State Environment Protection Policy - Prevention and Management of Contamination of Land*

Victorian Government (June 2003) *Variation to State Environment Protection Policy - Waters of Victoria*

Victorian Government (August 1997) *State Environment Protection Policy – Schedule F6 Waters of Port Phillip Bay (as varied in 2003)*

Work Safe Victoria (2010) *Guidance Note – Asbestos-contaminated soil*

World Health Organisation (2008) *Petroleum Products in Drinking-water*

World Health Organisation (2011) *Guidelines for Drinking-water Quality*

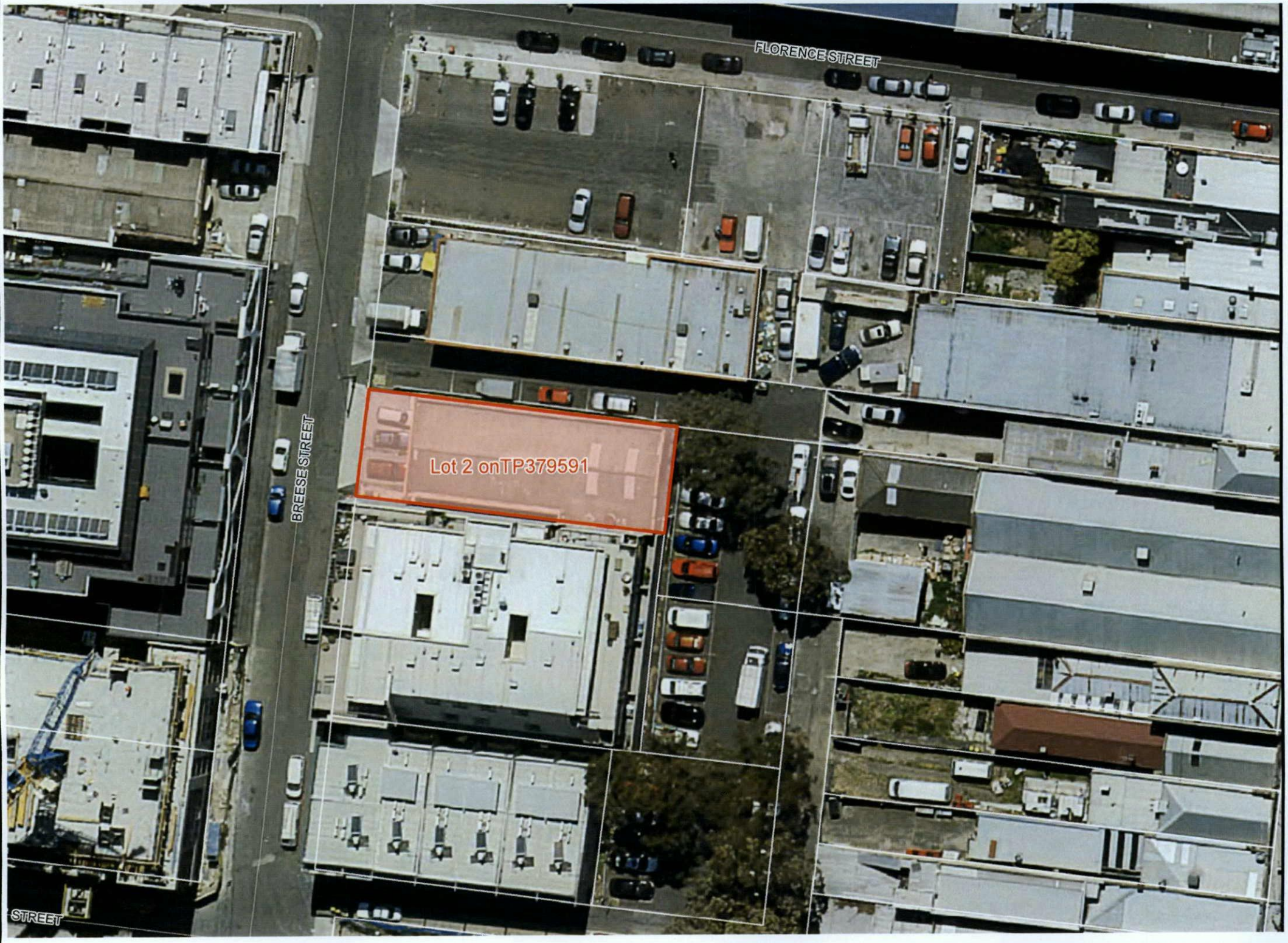
Site specific reports:

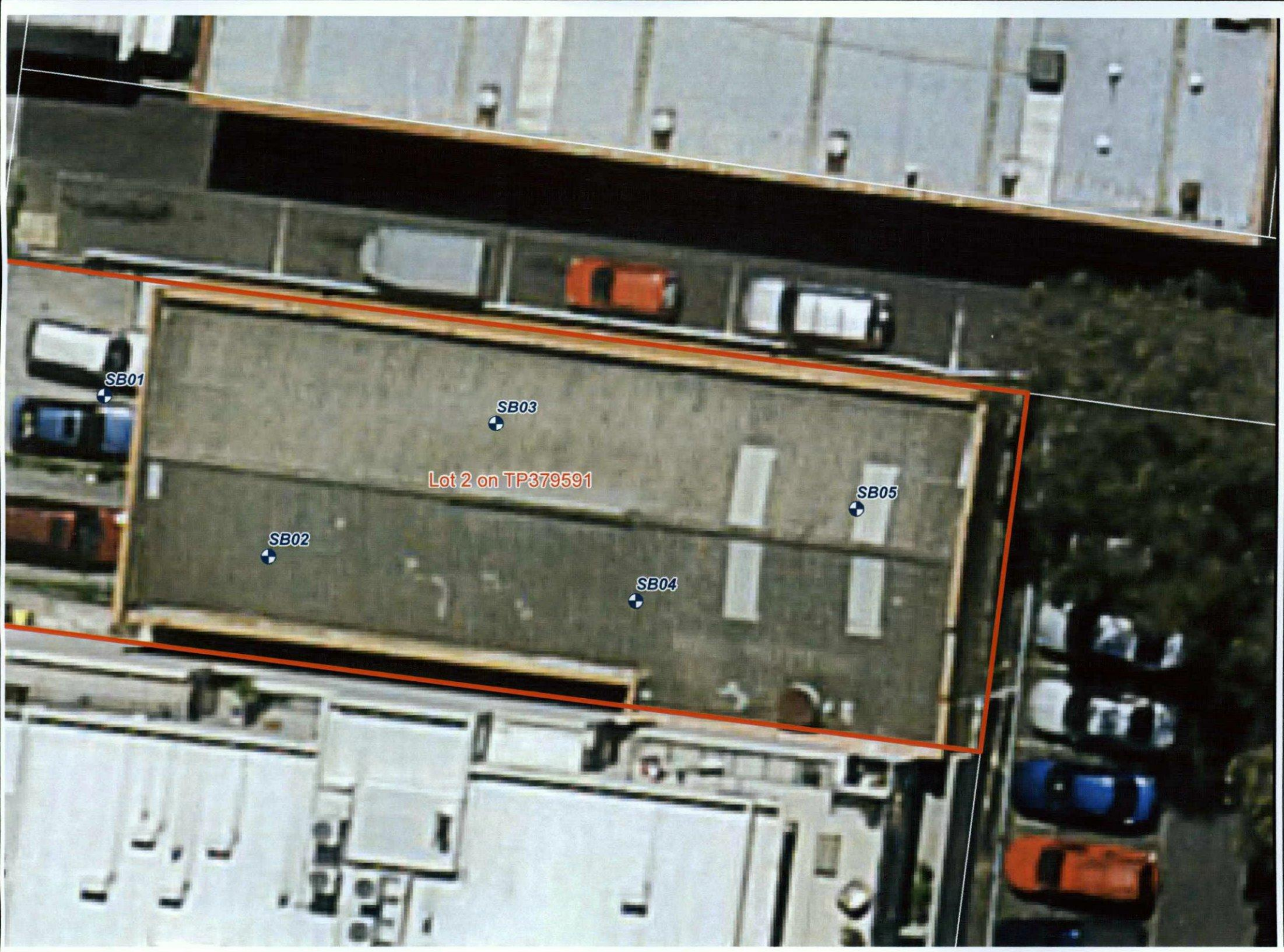
Diomides & Associates Pty Ltd (September 2013) – *RE: Phase 1 Site Contamination Assessment Property: 34 Breese Street, Brunswick.* Letter report

Alpha Environmental (August 2015) – *Detailed Site Investigation, 34 Breese Street, Brunswick.*

Appendix A

Figures


FLORENCE STREET
BREESE STREET
Lot 2 onTP379591
STREET


SB01
SB03
Lot 2 on TP379591
SB05
SB02
SB04

Appendix B

Certificate of Title

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HISTORICAL SEARCH STATEMENT Land Victoria

Produced 16/07/2015 08:28 AM

Volume 10968 Folio 241
Folio Creation: Created as a computer folio
Parent title Volume 08744 Folio 249

RECORD OF ALTS DEALINGS

Date Lodged for Registration	Date Recorded on Register	Dealing	Imaged	Dealing Type and Details

RECORD OF VOTS DEALINGS

Date Lodged for Registration	Date Recorded on Register	Dealing	Imaged
08/02/2007	08/02/2007	AE888153M	Y

TRANSFER OF LAND BY ENDORSEMENT
FROM:
HIRSHFORTY PTY. LTD.
TO:
ALOCOR INVESTMENTS PTY LTD

RESULTING PROPRIETORSHIP:
Estate Fee Simple
Sole Proprietor
ALOCOR INVESTMENTS PTY LTD of 27 WELSFORD STREET SHEPPARTON VIC 3630
AE888153M 08/02/2007

08/02/2007	08/02/2007	AE888154K	Y

MORTGAGE OF LAND
MORTGAGE AE888154K 08/02/2007
AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED

28/02/2011	13/05/2011	AP127006D	Y

Partially Cancelled by AP127006D
Remaining Land: Lot 2 on Title Plan 379591T

STATEMENT END

Volume 10968 Folio 241

124019126415W
Produced 18/09/2006 08:34 am

LAND DESCRIPTION

Lot 1 on Title Plan 379591T (formerly known as part of Portion 125 Parish of Jika Jika).
PARENT TITLE Volume 08744 Folio 249
Created by instrument AE603404H 13/09/2006

REGISTERED PROPRIETOR

Estate Fee Simple
Sole Proprietor
HIRSHFORTY PTY. LTD. of O'KEEFE WALTON RICHWOL SUITE 3 431 BURKE ROAD GLEN IRIS VIC 3146
F643223 24/03/1975

ENCUMBRANCES, CAVEATS AND NOTICES

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE TP379591T FOR FURTHER DETAILS AND BOUNDARIES

Delivered from the Landata ® System by SAI Global Property Division Pty Ltd
Delivered at 16/07/2015, for Order Number 30223932. Your reference: AE1502023.

Delivered by LANDATA®. Land Victoria timestamp 05/08/2015 09:54 Page 1 of 2
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TITLE PLAN		EDITION 2	TP 379591T

Location of Land

Parish: JIKA JIKA
Township:
Section:
Crown Allotment:
Crown Portion: 125(PT)

Last Plan Reference:
Derived From: VOL 8744 FOL 249
Depth Limitation: NIL

Notations

LOT 2 ON THIS PLAN TOGETHER WITH A RIGHT OF CARRIAGE WAY OVER THE ROAD COLOURED BROWN ON THE MAP ON C/T VOL. 4745 FOL. 877

ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN

Description of Land / Easement Information

THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT
COMPILED: 03/04/2000
VERIFIED: SO'C

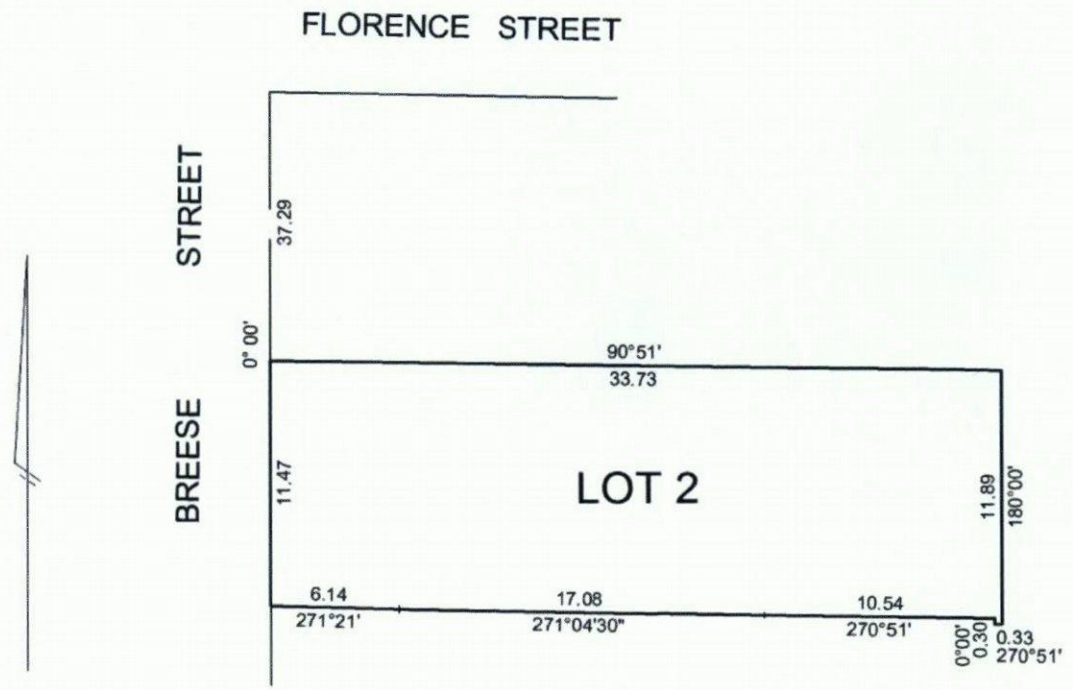


TABLE OF PARCEL IDENTIFIERS
WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962
PARCEL 2 = CP 125 (PT)

LENGTHS ARE IN METRES			Sheet 1 of 1 sheets

Appendix C

Auditor Summary Table

efer to Table 11 of Audit report)		% Clay*	Iron (%)	Cyanide (Free)	Moisture	Moisture Conter	pH (Lab)	TOC	Arsenic	Beryllium	Boron	Cadmium	Chromium (hex	Chromium (III+	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Zinc	C6 - C9	C10 - C14	C15 - C28	C29 - C36	C10 - C36 (Sum	>C6-C10	>C10-C16	>C16-C34	>C3
EQL		%	%	mg/kg	%	%	pH Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/k
M 2013 EIL/ESL: Site Filling									100	21 [2]		10 [1]	130 [2]	230	120 [2]	210	55000 [2]	1100	500 [3]	6.6 [1]	190	10 [4]	420						180	120	1300	560
M 2013 EIL/ESL: Natural Soils									100	21 [2]		10 [1]	130 [2]	440	120 [2]	240	55000 [2]	1100	500 [3]	6.6 [1]	370	10 [4]	1000						180	120	1300	560
M 2013 Management Limits																													800	1000	3500	10,0
M 2013 Residential A				250					100	60	4500	20	100		100	6000		300	3800	40	400	200	7400									
M 2013 Residential B				300					500	90	40000	150	500		600	30000		1200	14000	120	1200	1400	60000									
M 2013 Residential Soil HSL A/B, 0 to <1m, Clay																																
159							>5.5																									
npled_Date-Time	Matrix																															
04/2015	FILL	-	-	-	-	22	-	-	2.4	-	-	<0.4	-	33	-	44	-	21	-	<0.1	14	-	43	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	NATURAL	-	-	-	-	27	-	-	3.5	-	-	<0.4	-	38	-	7.4	-	6.7	-	<0.1	30	-	12	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	FILL	-	-	-	-	13	-	-	<2	-	-	<0.4	-	<5	-	<5	-	<5	-	<0.1	<5	-	5.2	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	FILL	-	-	-	-	15	-	-	4.1	-	-	<0.4	-	31	-	30	-	190	-	<0.1	16	-	240	<20	26	<50	<50	<50 - 76	<20	<50	<100	<10
04/2015	FILL	-	-	-	8.9	-	-	-	<4	-	-	<0.4	-	3	-	3	-	4	-	<0.1	1	-	6	<25	<50	<100	<100	<50	<25	<50	<100	<10
04/2015	NATURAL	-	-	-	-	17	-	-	3	-	-	<0.4	-	30	-	12	-	23	-	<0.1	24	-	27	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	FILL	<1	0.17	<5	-	4.3	7.3	15,000	<2	<2	<10	<0.4	<1	-	<5	<5	1700	18	18	<0.1	<5	<2	33	-	-	-	-	-	-	-	-	-
04/2015	NATURAL	-	-	-	-	21	-	-	2.9	-	-	<0.4	-	49	-	9.7	-	8.4	-	<0.1	22	-	17	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	FILL	-	-	-	-	5.3	-	-	<2	-	-	<0.4	-	<5	-	<5	-	16	-	<0.1	<5	-	17	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	NATURAL	-	-	<5	-	15	-	-	3	<2	<10	<0.4	<1	-	10	66	-	56	170	<0.1	13	<2	81	-	-	-	-	-	-	-	-	-
04/2015	NATURAL	40	3.4	-	-	18	7.2	9000	-	-	-	-	-	-	-	-	34,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/2015	FILL	-	-	-	-	4.3	-	-	<2	-	-	<0.4	-	<5	-	<5	-	8.2	-	<0.1	<5	-	9.3	<20	<20	<50	<50	<50	<20	<50	<100	<10
04/2015	NATURAL	-	-	-	-	15	-	-	2.9	-	-	<0.4	-	41	-	20	-	27	-	<0.1	14	-	44	<20	<20	<50	<50	<50	<20	<50	<100	<10

ill material

r to Table 11 of Audit report)		Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Hexachlorobenz	Pentachlorophe	2,4,5-Trichlorophl	Hedonal	Atrazine	2-Methyl-4-chlo	2-Methyl-4-Chlc	Mecoprop	4,4-DDE	Aldrin	Aldrin + Dieldrin	chlordane	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulpl	m
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
	EQL	0.1	0.1	0.1	0.2	0.1	0.3	0.05	1	0.5	0.5	0.2	0.5	0.5	0.5	0.05	0.05		0.1	0.05	0.05		0.05	0.05	0.05	0.05	
2013 EIL/ESL: Site Filling		65	125	105			45														180						
2013 EIL/ESL: Natural Soils		65	125	105			45														180						
2013 Management Limits																											
2013 Residential A								10	100	600	900	320	600	600	600			6	50			240					
2013 Residential B								15	130	900	1600	470	900	900	900			10	90			600					
2013 Residential Soil HSL A/B, 0 to <1m, Clay		0.7		480			110																				
ed_Date-Time	Matrix																										
2015	FILL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	NATURAL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	FILL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	FILL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	FILL	<0.2	<1	<0.5	<2	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	NATURAL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	FILL	-	-	-	-	-	-	<0.05	<1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1	<0.1	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<
2015	NATURAL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	FILL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	NATURAL	-	-	-	-	-	-	<0.05	<1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1	<0.1	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<
2015	NATURAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	FILL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	NATURAL	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

naterial

	Chlorpyrifos	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene	Benzo(a)pyrene	Carcinogenic PAHs	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Benzo[b+j]fluoranthene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Picloram	Pyrene	PAHs (Sum of total)	Mirex	2-methylphenol	3-&4-methylphenol	Phenol	Arochlor 1016	
port)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg
EQL	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.01	0.2	0.4	0.5	0.1	0
										0.7									170										
ls										0.7									170										
its																													
	160					3	3	3	3												4500		300	10			3000		
	340					4	4	4	4												6600		400	20			45000		
L A/B, 0 to <1m, Clay																			5										
Matrix																													
FILL	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	-	-	-	-	
NATURAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	
FILL	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	-	-	-	-	
FILL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	
FILL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	
NATURAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	
FILL	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.2	<0.4	<0.5	<0.1	<0
NATURAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	
FILL	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	-	-	-	-	
NATURAL	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.2	<0.4	<0.5	<0.1	<0
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FILL	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	-	-	-	-	
NATURAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	

Appendix D

Alpha Environmental – Detailed Site Investigation (Alpha 2015)

4

CLEAR GLASS (GL1)

TRANSLUCENT GLASS (TG1)

DARK GREY BRICK (AF1)

APPLIED FINISH - GLOSSY BLACK ON GROOVE SUBSTRATE (AF2)

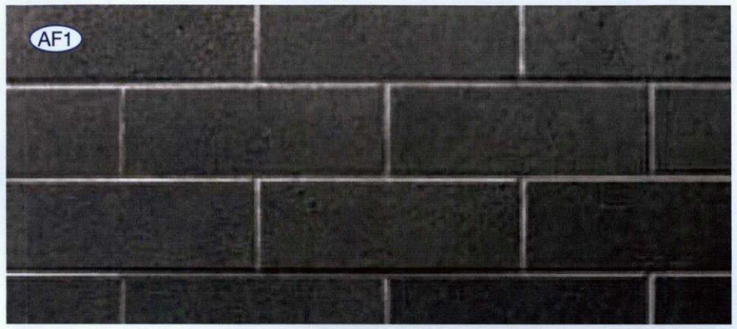
APPLIED FINISH - WHITE PAINT ON FC. FASCIA (AF3)

METAL FINISH - SCREEN (M1)

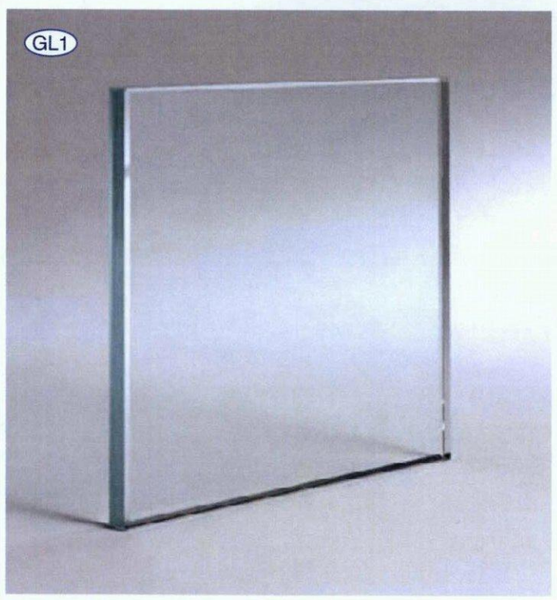
EXTERNAL FINISHES 7.1

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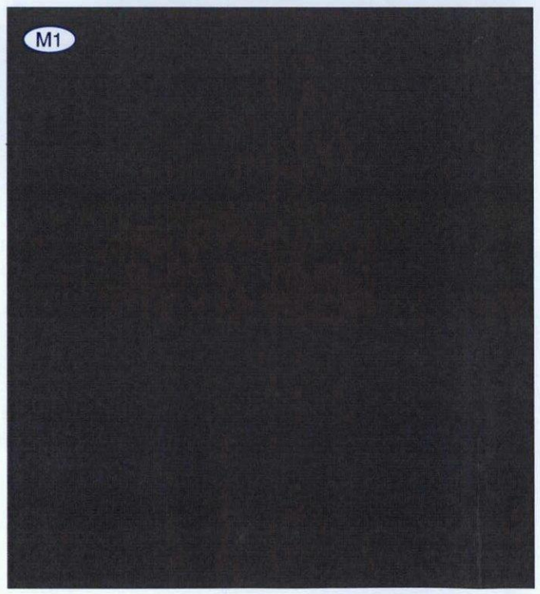
TG1







AF3



PROJECT	JOB NUMBER	DATE	DRAWING	NORTH
34 BREESE ST BRUNSWICK	11568	6/11/2013	**7.1 EXTERNAL FINISHES**	

ALOCOR PTY LTD

plus architecture

RENZO TONIN & ASSOCIATES
inspired to achieve

Acoustics
Vibration
Structural Dynamics

28 September 2015
MB580-01F02 Acoustic Report (r2)

Alocor Investment c/- Plus Architecture
Anthony Aloe
nadiaaloe@gmail.com

From: Andrew Lloyd [Andrew.Lloyd@renzotonin.com.au]

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34 Breese Street, Brunswick - Acoustic Report

1 Introduction

Renzo Tonin & Associates was engaged by Alocor Investment c/- Plus Architecture to provide an acoustic report for the proposed residential development at 34 Breese Street, Brunswick (the Subject Site). This report addresses Condition 8 of a VCAT Consent Order MPS/2013/896, as follows:

8. Prior to the commencement of the development approved by this permit, a report prepared by a qualified Acoustic Engineer must be submitted to the satisfaction of the Responsible Authority outlining specific noise attenuation measures to protect dwellings from external noise sources. Construction and maintenance of the buildings must be in accordance with the recommendations contained in this report to the satisfaction of the Responsible Authority. No alterations to the Acoustic Report may occur without the written consent of the Responsible Authority.

It is noted that the permit condition above is ambiguous and it is unclear which noise sources are specifically required to be assessed. It is unclear whether the primary concern is with external noise sources affecting the proposed development, or whether it is external noise sources from the development affecting other nearby residential developments. In absence of this clarification, this report assesses all noise sources which are considered to impact upon, or which may be emitted from the proposed development.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001. Appendix A contains a glossary of acoustic terms used in this report.

2 Site Description

The Subject Site is zoned Commercial 1 (B2Z) and is surrounded by a mix of multi-storey residential developments and commercial buildings. The proposed development will consist of five stories all of

which are above ground. Ground floor is proposed to contain 13 carparks with car stackers as well as a small retail tenancy facing Breese Street. Levels 1 to 4 are proposed to contain a total of 18 apartments.

The Subject Site is located approximately 100 metres from the Upfield Metro rail line. This train line only carries Metro Electric Multiple Unit (EMU) timetabled services. Noise impacts to the development from train passbys are considered to be minimal due to distance separation and the shielding provided by the existing residential buildings at 33-37 Breese Street.

The Subject Site is abutted:

- To the west across Breese Street by various multi-storey residential developments including a six storey residential development directly adjacent at 37 Breese Street.
- To the south by 32 Breese Street, a five storey residential development.
- To the north across a laneway by 38 Breese Street, a single storey commercial building, Abu Ramzi Co which operates as a fruit and vegetable wholesaler.
- To the east across a laneway by the back of a number of single and double storey commercial and retail buildings located along Sydney Road.

3 Existing Noise Environment

Background noise varies over the course of any 24 hour period, typically from a minimum at 3am to a maximum during morning and afternoon peak hour. In order to quantify the existing noise levels, Renzo Tonin & Associates conducted unattended noise monitoring at the Subject Site from 16th to 27th April 2015 as detailed below.

Surveys of the site and surround were conducted during the early evening on the 16th April and during the middle of the day on the 27th April. During these surveys, no significant sources of commercial noise were identified which would be likely to cause SEPP N-1 noise limit exceedance at the Subject Site.

Noise Monitor Location L1: **34 Breese Street**

The noise monitor was installed on top of the entrance awning attached to the existing two storey building on site. The microphone was set at 1 metre from the façade and at a height of 3.5 metres above ground level.

The noise environment at this location was observed to be dominated by local sparse traffic on Breese Street and distant traffic from Sydney Road.

The noise monitor was configured to record broadband noise levels.

The equipment used for noise measurements was an RTA Technology 02 Class 2 noise monitor. The calibration of this device was checked in the field immediately before and after the measurement using

a Brüel & Kjær Type 4231 calibrator; no drift in calibration was observed. The RTA 02 sound meter complies with AS IEC 61672.1:2004 *Electroacoustics - Sound Level Meters*; the calibrator complies with AS IEC 60942:2004 *Electroacoustics - Sound Calibrators*. All equipment carries current NATA certification (or if less than 2 years old, manufacturers certification).

Noise monitoring results were assessed and design noise levels determined as presented in Table 1. Noise monitoring locations are shown in Figure 1 below. Full results of noise monitoring are presented in Appendix B.

Table 1 – Summary of Noise Monitoring Results

Location L1	Ambient LA90 Noise Levels dB			Ambient LAeq Noise Levels dB		
	Day	Evening	Night	Day	Evening	Night
Absolute minimum[1] – for SEPP N-1 & EP regulations	46	46	43	-	-	-
Reference level[2] – for AS2107	-	-	-	60	-	55

Notes:
1. Absolute minimum' is the minimum hourly measurement for each period that occurring during monitoring.
2. Energy averaged representative ambient noise level per period.

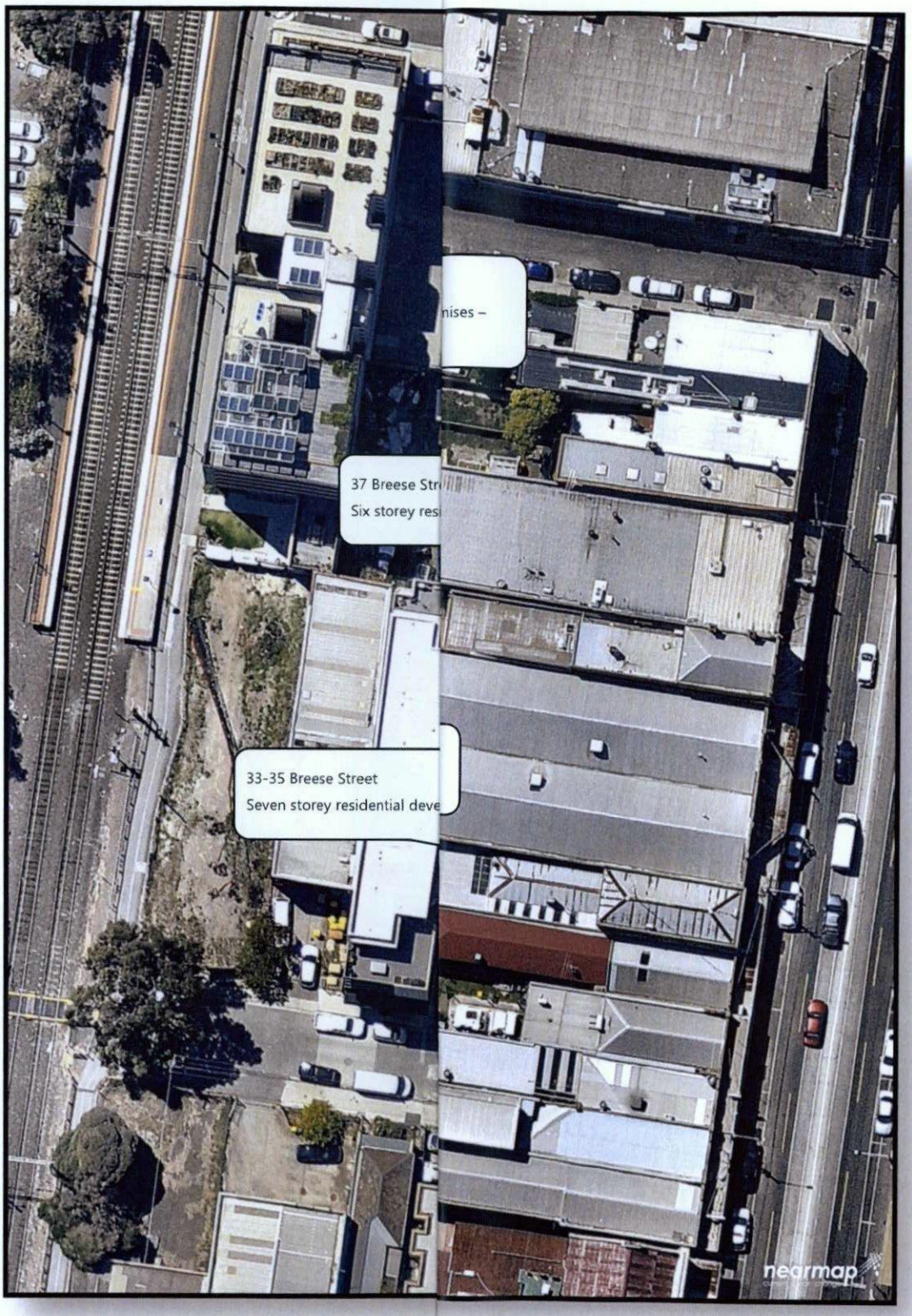


Figure 1 - Site Location

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4 Criteria

4.1 Internal Noise Levels

Australian/New Zealand Standard AS/NZS 2107: 2000 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors provides (AS2107) target criteria for environmental noise impacts on apartments as presented in Table 2. These criteria cover all continuous noise sources (mechanical plant, traffic etc.)

Table 2 – AS2107:2000 Internal Noise Level Criteria

Type of occupancy / activity	Recommended design sound level, LAeq, dB(A)	
	Satisfactory[2]	Maximum[3]
Houses & apartments near minor roads – Living areas	30	40
Houses & apartments near minor roads – Sleeping areas[1]	30	35
Houses & apartments near minor roads – Apartment common areas	45	55

Notes:
1. Assessment taken to apply to sleeping areas between the hours of 10:00pm and 7:00am.
2. The level of noise that has been found to be acceptable by most people for the environment in question and also to not be intrusive.
3. The level of noise above which most people occupying the space start to become dissatisfied with the level of noise.

4.2 Noise Emissions

4.2.1 Base Building Services & Commercial Plant

Noise from base building services shall be designed to comply with, and assessed against State Environment Protection Policy (SEPP) N-1 *Control of Noise from Commerce, Industry and Trade.*

Table 3 presents the applicable SEPP N-1 noise limits, calculated from planning overlay zoning information and existing background noise levels. SEPP N-1 night-time limits are more stringent than day or evening limits; compliance during the night-time period implies compliance during the day and evening periods, provided that emitted noise levels do not vary. Limits are applicable outside, at noise sensitive receivers that include residential premises.

Table 3: SEPP N-1 Noise Limits for Base Building Plant

Period	Location	Zoning Level dB	Background LA90 dB	Classification	Applicable Limit LAeq dB
Day	Nearest residential receivers	59	46[1]	Neutral	59
Evening		52	46[1]	Neutral	52
Night		47	43[1]	Neutral	47

Notes:
1. Lowest 60 minute ambient background noise level measured for the Period during monitoring.

4.2.2 Domestic Plant - Environment Protection Regulations

Noise from the operation of domestic plant located on a private title shall be designed to comply with, and assessed against the applicable criteria defined in the Environment Protection Act 1970 and the Environment Protection Regulations 2008. The Act and Regulations refer to unreasonable noise and apply a requirement for inaudibility (which can be tested subjectively) during the night period but does not prescribe any specific objective criterion for the day or evening periods. Bridging this gap the EPA document Noise Control Guidelines (Publication 1254, October 2008) states that the intrusive noise shall not exceed the background noise level by more than 5dB at the affected receiver.

Table 4: Criteria for Noise from Domestic Plant

Period	Location	Background L_{90} dB(A)	Permissible Limit L_{eq} dB(A)
Day	Nearest affected residential receivers	46	51
Evening		46	51
Night		43	38[1]

Note: 1. A noise level at 5dB below background is expected to be inaudible

5 Assessment & Recommendations

5.1 Glazing & Façade Specification

The advice provided in this specification is based on Town Planning drawings provided by Plus Architecture Revision 2 current as of 24/07/2015. Table 5 and Table 6 provide details of the recommended glazing and façade specification to for design compliance with AS2107. Note that there is no acoustic requirement for glazing not referenced in the following table; as such glazing not referenced below may be as required by the ESD consultant's specification. It is noted that the façade construction has not yet been determined so the façade constructions listed in Table 6 should be considered examples only.

The Subject Site is sufficiently buffered from arterial roads with the closest major road, Sydney Road, located approximately 75 metres to the east. Local traffic on Breese Street and surrounding roads is sparse. Consequently the impacts of traffic noise on the proposed apartments are considered minor.

Table 5 – Glazing Specification

Apartments	Glazing Orientation	Occupancy	Glazing Thickness & Type	Acoustic Rating of Glazing Assembly Rw	Laboratory Test Reference
All	ALL	Bedrooms and Living Rooms	Any single or double glazed system incorporating at least one pane of standard 6mm thick float glass	28	NAL Report ATF 768

1. The term "glazing assembly" means the glass, frame and seals including the perimeter seal at the wall junction.
2. The specified Rw rating must be achieved by the glazing product specified or selected.
3. By way of explanation, the Sound Insulation Rating Rw is a measure of the noise reduction property of the glazing assembly, a higher rating implying a higher sound reduction performance.
4. Note that the Rw rating of systems measured as built on site (R'w Field Test) may be up to 5 points lower than the laboratory result.

LEGEND where there is no Laboratory Test Reference:

5. ESTIMATE: The client is advised not to commence detailing or otherwise commit to glazing assemblies which have not been tested in an approved laboratory or for which an opinion only is available. Testing of glazing assemblies is a component of the quality control of the design process and should be viewed as a priority because there is no guarantee the forecast results will be achieved thereby necessitating the use of an alternative which may affect the cost and timing of the project. No responsibility is taken for use of or reliance upon untested glazing assemblies, estimates or opinions. The advice provided here is in respect of acoustics only.
6. ESTIMATE – APPROVED FOR CONSTRUCTION: Use of the glazing assembly is approved prior to laboratory certification. To complete the quality control of the design process and confirm the acoustical performance of the glazing assembly, we recommend testing in a laboratory to confirm the Rw rating as soon as practicable.
7. ESTIMATE – TEST NOT REQUIRED: Use of the glazing assembly is approved without laboratory certification. The STC/Rw of the form of construction exceeds the project requirements.

NOTES FOR GLAZING CONSTRUCTIONS:

8. The information in this table is provided for the purpose of Council approvals process and cost planning and shall not be used for construction unless otherwise approved in writing by the acoustic consultant.
9. The design in this table is preliminary and a comprehensive assessment shall be conducted prior to Construction Certification.
10. Before committing to any form of construction or committing to any builder, advice should be sought from an acoustic consultant to ensure that adequate provisions are made for any variations which may occur as a result of changes to the glazing assembly where only an "estimate" is available for the sound insulation properties of recommended materials.
11. The glazing supplier shall ensure that installation techniques will not diminish the Rw performance of the glazing when installed on site.
12. All openable glass windows and doors shall incorporate full perimeter acoustic seals equivalent to Q-Lon, which enable the Rw rating performance of the glazing to not be reduced.
13. The above glazing thicknesses should be considered the minimum thicknesses to achieve acoustical ratings. Greater glazing thicknesses may be required for structural loading, wind loading etc.

GENERAL

14. The sealing of all gaps in acoustic rated glazing assemblies and partitions is critical in a sound rated construction. Use only sealer approved by the acoustic consultant.
15. Check design of all junction details with acoustic consultant prior to construction.
16. Check the necessity for HOLD POINTS with the acoustic consultant to ensure that all building details have been correctly interpreted and constructed.
17. The information provided in this table is subject to modification and review without notice.
18. The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

Table 6 – Façade Specification

Construction Type	Area of Application	Façade Construction	Acoustic Rating of Façade Assembly Rw	Laboratory Test Reference
Lightweight facade	All apartments as applicable	Steel studs not less than 76mm in size. Cavities between studs filled with 75mm thick polyester or glasswool insulation having a density of no less than 11kg/m^3. **Apartment side:** Fixed with one (1) layer of 13mm thick standard plasterboard **External side:** Fixed with one (1) layer of 4mm thick alucobond or equivalent façade panel system.	41	Estimate
Masonry facade	All apartments as applicable	**Apartment side:** Fixed with one (1) layer of 13mm thick standard plasterboard via 28mm furring channels. **External Side:** Minimum 90mm thick concrete, brick or blockwork. Additional cladding or render to architects specification.	>45	Estimate

Notes: The above façade specification shall be considered examples only. Where the builder proposes to build a different form of façade, it shall meet the minimum Rw rating specified.

LEGEND where no appropriate test certificate exists:

1. ESTIMATE: The client is advised not to commence detailing or otherwise commit to partition construction systems which have not been tested in an approved laboratory or for which an opinion only is available. Testing of partition construction systems is a component of the quality control of the design process and should be viewed as a priority because there is no guarantee the forecast results will be achieved thereby necessitating the use of an alternative which may affect the cost and timing of the project. No responsibility is taken for use of or reliance upon untested partition construction systems, estimates or opinions. The advice provided here is in respect of acoustics only.
2. ESTIMATE – APPROVED FOR CONSTRUCTION: Use of the form of construction is approved prior to laboratory certification. To complete the quality control of the design process and confirm the acoustical performance of the construction, we recommend testing in a laboratory to confirm the Rw rating as soon as practicable. In the case of impact rating for floor systems, no particular impact rating is guaranteed to comply with either the Building Code of Australia or Strata Scheme Management Act and hence carpet runners may still be required.
3. ESTIMATE – TEST NOT REQUIRED: Use of the form of construction is approved without laboratory certification. The STC/Rw of the form of construction exceeds the project requirements.
4. The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

GENERAL

5. The sealing of all gaps in partitions is critical in a sound rated construction. Use only sealer approved by the acoustic consultant.
6. Check design of all junction details with acoustic consultant prior to construction.
7. Check the necessity for HOLD POINTS with the acoustic consultant to ensure that all building details have been correctly interpreted and constructed.
8. The information provided in this table is subject to modification and review without notice.
9. The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

5.2 Mechanical Services

5.2.1 In-principle Advice for Installation of Base Building & Commercial Plant.

It is important to note that in order to carry out a quantitative assessment of base building mechanical equipment, a complete specification of equipment is required. At this early stage of the development appropriate detail for mechanical plant is not available and therefore only in-principle noise management measures can be outlined. Acoustic assessment of mechanical services equipment should be undertaken during the detail design phase of the development to ensure that the cumulative noise of all equipment does not exceed the applicable noise criteria at the nearest residential receivers which are likely to be those within the subject development itself. The mechanical subcontractor shall ensure that any plant installed at the development complies with the criteria presented in Section 4.2.1 at the nearest residential receivers.

While plant selections and installation locations are unknown at this early stage, some in-principle advice can be given to limit the risk of inadequate design. It is noted that the carpark is relatively small and as it is located on ground floor it is not yet known whether the carpark will be naturally ventilated or whether carpark supply/exhaust fans will be required. If carpark fans are required then these are likely to be situated on the rooftop. We note that the subject development roof will be at the same level as the adjoining roof at 32 Breese Street, so noise impacts from this rooftop are unlikely. It is recommended that all base building supply/exhaust fans allow for approximately 2m of 50mm thick lined acoustic ducting on the fan discharges. It is also recommended to ensure that fans or discharges are located centrally on the rooftop with as much separation from the roof edge as possible.

The carpark contains five car stackers located at the back of the building farthest from the entrance which is located off Breese St. The supplier shall be responsible for the design and installation of the car stackers to ensure that noise and vibration levels are kept to a minimum. To prevent structural noise transfer to adjacent apartments the car stacker should only be fixed to the ground and isolated using anti-vibration mounts. The car stacker should not be attached to the walls or ceiling of the carpark. Noise from the lift operation, hydraulic motor and locking mechanisms should not exceed 65dB(A) L_{Amax} at 2m from the motor.

5.2.2 Advice for Installation of Fixed Domestic Plant

The mechanical sub-contractor shall supply and install domestic air conditioning equipment such that resulting external noise emissions to any residential premises comply with the criteria presented in Section 4.2.2. Air-conditioning equipment is a prescribed item under Regulation 6 Group 3 of the Environmental Protection (Residential Noise) Regulations 2008 which requires inaudibility during the night period. We recommend that a clause to the effect of the following be included in the owners' corporation rules:

"If a valid complaint is raised relating to the audibility of a neighbour's domestic air-conditioning unit during the prohibited hours, then the subject air-conditioner shall be switched off during the prohibited hours.

Prohibited hours:

- *10pm – 7am Monday – Friday*
- *10pm – 9am weekends & public holidays.*

5.2.3 Music Noise from Commercial Premises

It is mandatory that music noise levels from the ground floor retail tenancy comply with SEPP-N2 noise limits. To help ensure compliance it is recommended that a clause be inserted into the lease agreement to the effect of:

"Only background music shall be played within the tenancy and this shall comply with SEPP-N2 noise limits at the nearest residences at all times. Consistent with S.9A of the Amended Liquor Control Act, 'background music' means a level that enables patrons to conduct a conversation at a distance of 600 millimetres without having to raise their voices to a substantial degree".

Document Control

Date	Revision History	Non-Issued Revision	Issued Revision	Prepared	Instructed	Authorised
30.04.2015	Draft	0		AL		
01.05.2015	Review		1	AL		DT
28.09.2015	Updated TP Drawings		2	AL		AL

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APPENDIX A Glossary of Terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment Period	The period in a day over which assessments are made.
Assessment Point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background Noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.

L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound Absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound Level Meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound Pressure Level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound Power Level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B Noise Monitoring Results

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BACKGROUND & AMBIENT NOISE MONITORING RESULTS - dB(A)

	L_{A90} Background Noise Levels [4]			L_{Aeq} Ambient Noise Levels [5]		
Date	**Day**	**Evening**	**Night**	**Day**	**Evening**	**Night**
Thursday-16-April-2015	-	49.0	45.8	-	55.4	52.4
Friday-17-April-2015	50.9	49.6	46.0	59.1	55.3	52.9
Saturday-18-April-2015	50.4	50.8	45.8	57.9	56.7	53.8
Sunday-19-April-2015	48.4	47.9	44.9	56.2	57.0	54.4
Monday-20-April-2015	50.1	47.4	45.1	58.8	54.6	55.1
Tuesday-21-April-2015	49.8	47.1	44.9	58.4	54.3	53.6
Wednesday-22-April-2015	50.9	48.2	45.1	58.8	54.0	51.0
Thursday-23-April-2015	51.4	48.8	45.4	59.5	54.6	52.6
Friday-24-April-2015	51.3	48.8	45.9	59.6	55.6	50.6
Saturday-25-April-2015	-	50.3	46.1	-	57.2	51.5
Sunday-26-April-2015	48.5	46.9	44.4	56.3	53.8	49.5
Monday-27-April-2015	48.4	-	-	56.7	-	-
Representative Level [6]	**50.0**	**48.6**	**45.4**	**58.3**	**55.5**	**52.8**
Minimum Measured	**46.3**	**46.4**	**42.7**			

Notes:

1. Day is taken to be 7:00am to 6:00pm
2. Evening is taken to be 6:00pm to 10:00pm.
3. Night is taken as 10:00pm to 7:00am
4. Arithmetically averaged hourly L90 data for each period
5. Logarithmically averaged hourly LAeq data for each period
6. L90 arithmetically averaged & LAeq logarithmically averaged

VICROADS TRAFFIC NOISE MONITORING RESULTS - dB(A)

	L_{A10} Noise Levels		L_{Aeq} Noise Levels			
Date	**18hr**	**12hr**	**15hr**	**9hr**	**16hr**	**8hr**
Thursday-16-April-2015	-	-	-	54.4	-	52.1
Friday-17-April-2015	-	-	-	-	-	-
Saturday-18-April-2015	-	62.4	59.8	55.8	59.7	52.8
Sunday-19-April-2015	-	-	-	56.4	-	55.7
Monday-20-April-2015	61.0	63.4	60.0	57.1	60.0	53.2
Tuesday-21-April-2015	61.2	63.5	59.6	55.6	60.2	51.9
Wednesday-22-April-2015	61.1	63.6	59.8	53.0	60.1	51.7
Thursday-23-April-2015	62.0	64.0	60.6	54.6	60.5	53.5
Friday-24-April-2015	63.0	63.7	61.0	-	60.9	-
Saturday-25-April-2015	-	-	-	53.5	-	53.8
Sunday-26-April-2015	58.8	60.1	57.8	51.5	57.6	51.5
Monday-27-April-2015	-	-	-	-	-	-
Representative Weekday	**61.7**	**63.6**	**60.2**	**55.2**	**60.4**	**52.5**
Representative Weekend	**58.8**	**61.3**	**58.9**	**54.7**	**58.8**	**53.7**

Notes:

1. 8hr is taken to be 10:00pm to 6:00am
2. 9hr is taken to be 10:00pm to 7:00am
3. 12hr is taken to be 6:00am to 6:00pm
4. Measurements containing continuous extraneous noise lasting more than 3 hours are rejected and omitted from this table.
5. 15hr is taken to be 7.00am to 10.00pm
6. 16hr is taken to be 6:00am to 10:00pm
7. 18hr is taken to be 6:00am to 12:00am

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34 Breese Street

Thursday, 16 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	-	49.0	45.8
Leq[3]	-	55.4	52.4

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	68.2	to	90.3
Lmax - Leq (Range)	19.6	to	29.5

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	-
L10 12 hr (6am-6pm)	-
Leq 16hr (6am-10pm)	-
Leq 8hr (10pm-6am)	52.1
Leq 15hr (7am-10pm)	-
Leq 9hr (10pm-7am)	54.4

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

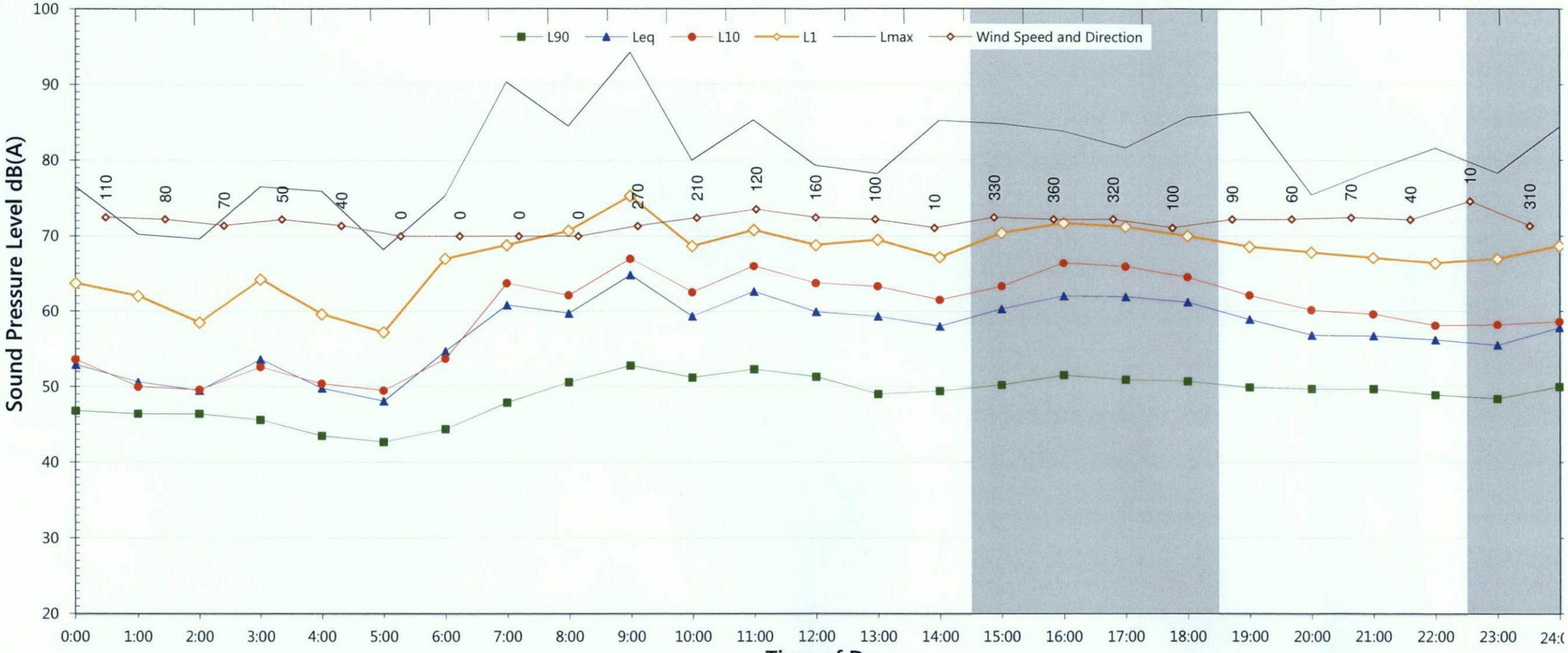
Data File: MB580-01L01 34 Breese St (r0)

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34 Breese Street

Friday, 17 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	50.9	49.6	46.0
Leq[3]	59.1	55.3	52.9

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	71.5	to	80.7
Lmax - Leq (Range)	19.8	to	27.1

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	-
L10 12 hr (6am-6pm)	-
Leq 16hr (6am-10pm)	-
Leq 8hr (10pm-6am)	-
Leq 15hr (7am-10pm)	-
Leq 9hr (10pm-7am)	-

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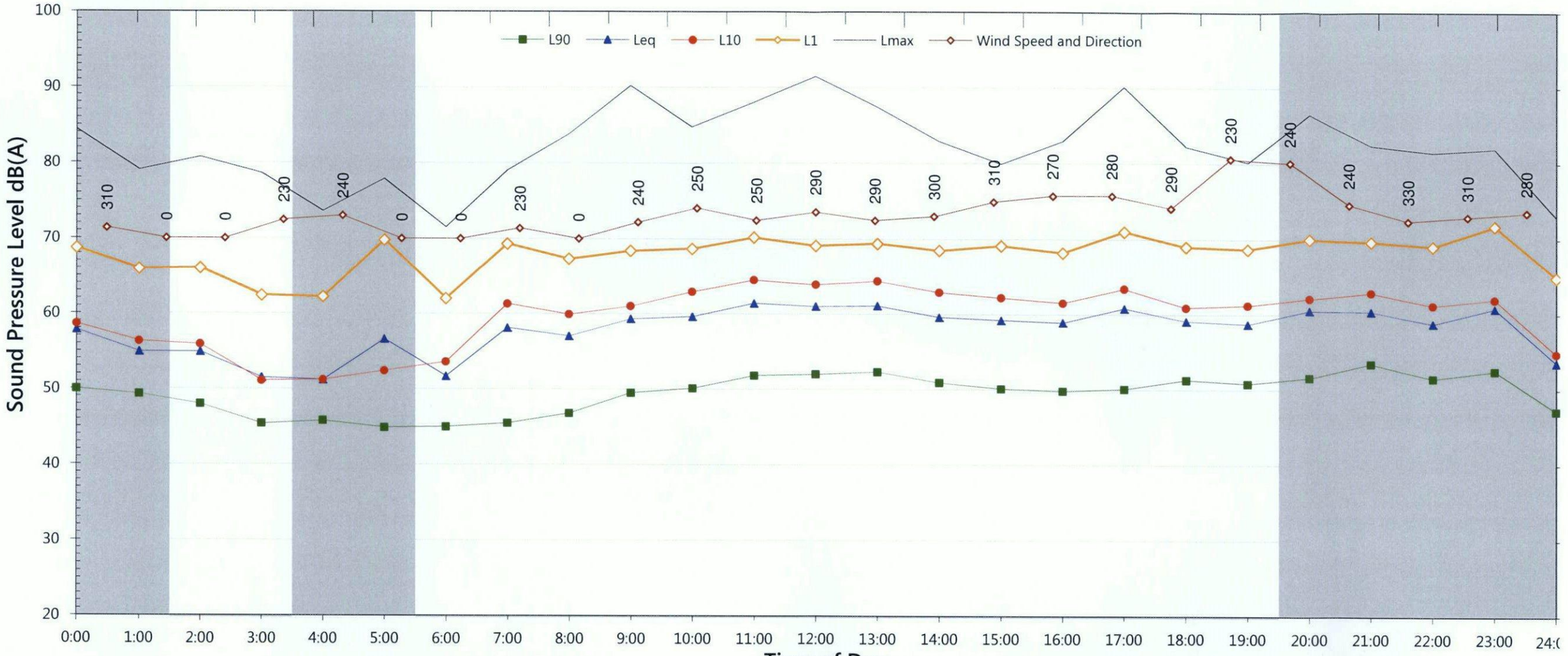
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

Unattended Noise Monitoring Results

34 Breese Street

Saturday, 18 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	50.4	50.8	45.8
Leq[3]	57.9	56.7	53.8

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	69.3	to	88.9
Lmax - Leq (Range)	19.4	to	27.7

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	-
L10 12 hr (6am-6pm)	62.4
Leq 16hr (6am-10pm)	59.7
Leq 8hr (10pm-6am)	52.8
Leq 15hr (7am-10pm)	59.8
Leq 9hr (10pm-7am)	55.8

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

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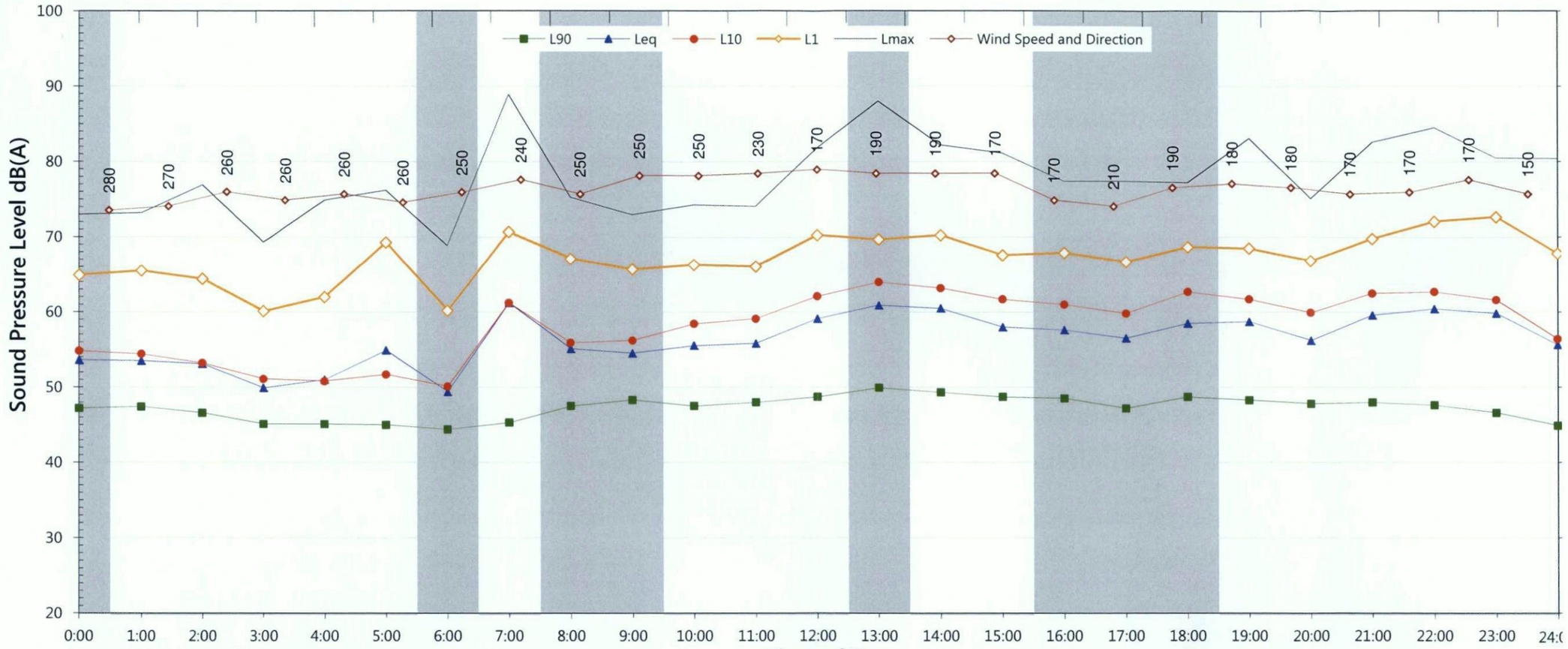
Data File: MB580-01L01 34 Breese St (r0)

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34 Breese Street

Sunday, 19 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.4	47.9	44.9
Leq[3]	56.2	57.0	54.4

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	71.8	to	83.3
Lmax - Leq (Range)	20.4	to	27.6

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	-
L10 12 hr (6am-6pm)	-
Leq 16hr (6am-10pm)	-
Leq 8hr (10pm-6am)	55.7
Leq 15hr (7am-10pm)	-
Leq 9hr (10pm-7am)	56.4

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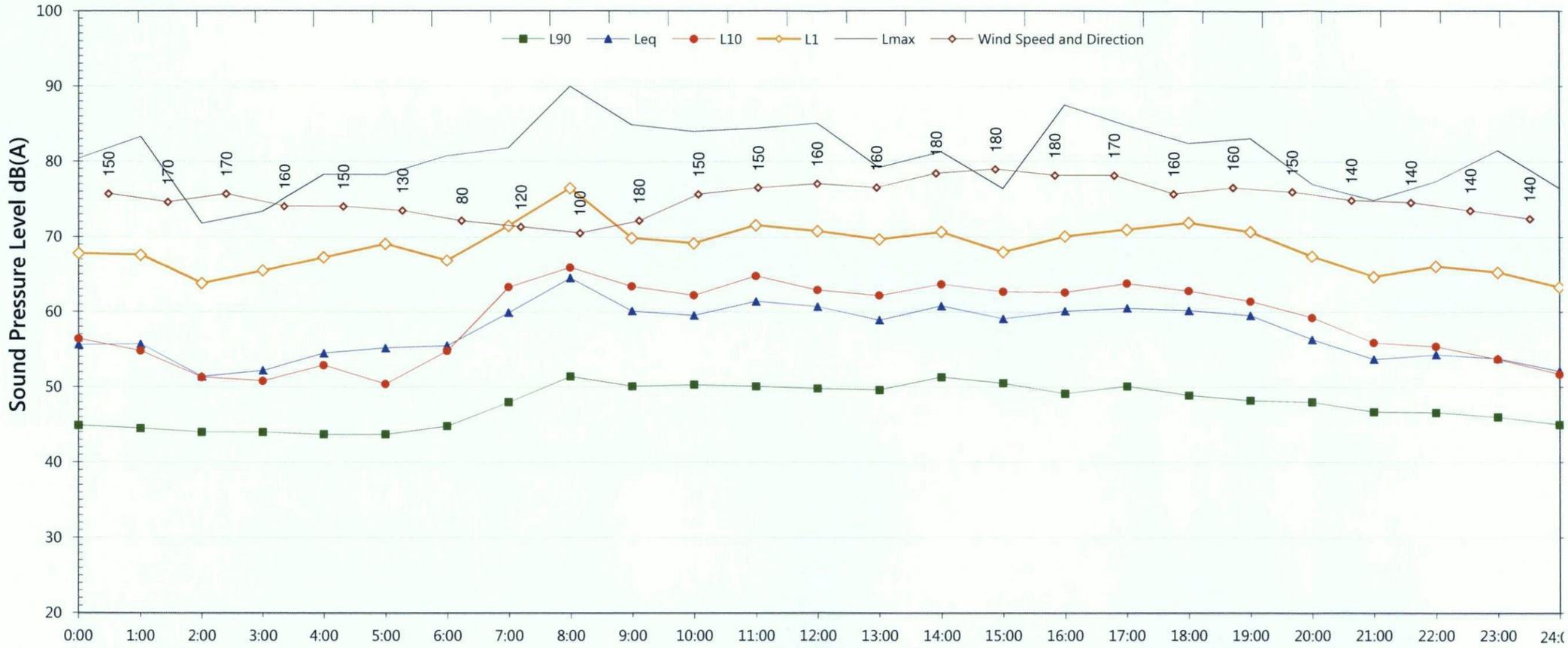
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

Unattended Noise Monitoring Results

34 Breese Street

Monday, 20 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	50.1	47.4	45.1
Leq[3]	58.8	54.6	55.1

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	69.7	to	98.5
Lmax - Leq (Range)	19.7	to	33.8

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	61.0
L10 12 hr (6am-6pm)	63.4
Leq 16hr (6am-10pm)	60.0
Leq 8hr (10pm-6am)	53.2
Leq 15hr (7am-10pm)	60.0
Leq 9hr (10pm-7am)	57.1

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

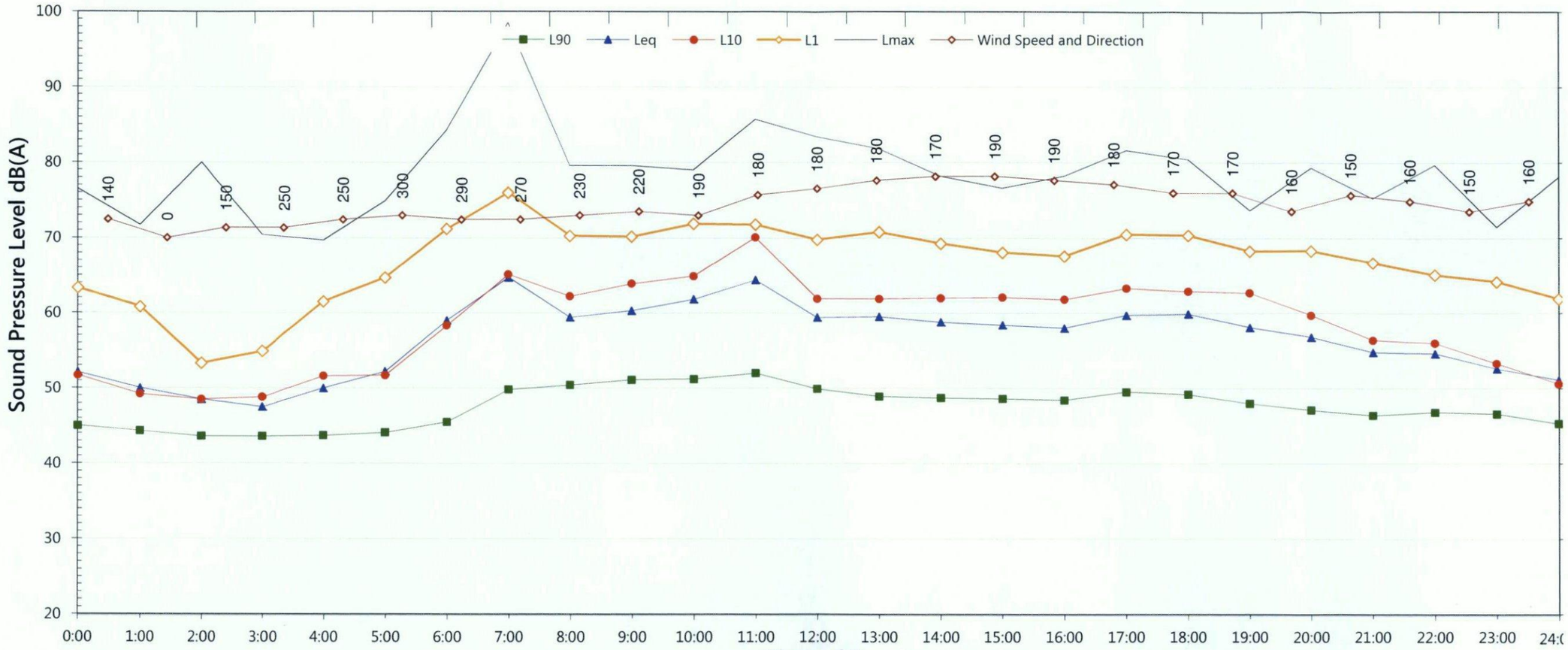
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

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34 Breese Street

Tuesday, 21 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	49.8	47.1	44.9
Leq[3]	58.4	54.3	53.6

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	66.7	to	88.5
Lmax - Leq (Range)	18.9	to	27.1

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	61.2
L10 12 hr (6am-6pm)	63.5
Leq 16hr (6am-10pm)	60.2
Leq 8hr (10pm-6am)	51.9
Leq 15hr (7am-10pm)	59.6
Leq 9hr (10pm-7am)	55.6

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

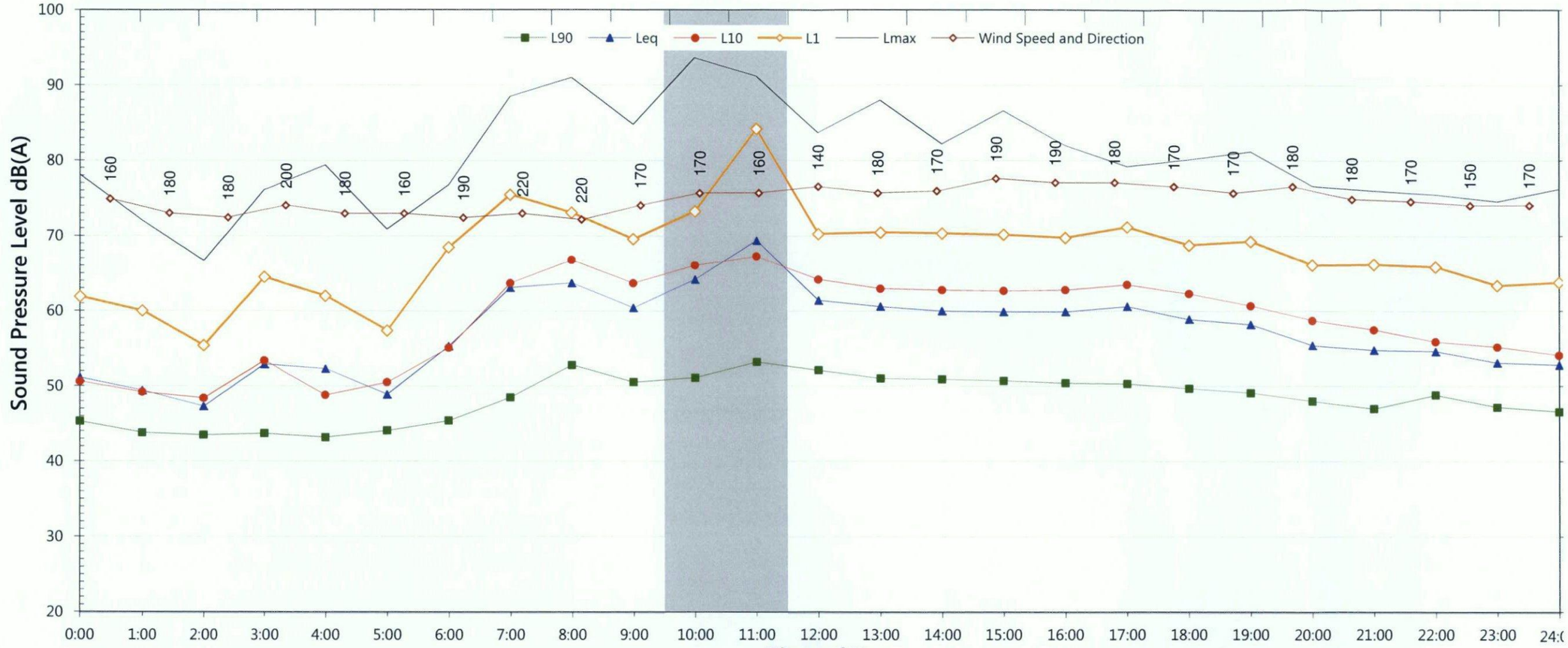
Data File: MB580-01L01 34 Breese St (r0)

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34 Breese Street

Wednesday, 22 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	50.9	48.2	45.1
Leq[3]	58.8	54.0	51.0

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	70.1	to	83.3
Lmax - Leq (Range)	21.5	to	30.6

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	61.1
L10 12 hr (6am-6pm)	63.6
Leq 16hr (6am-10pm)	60.1
Leq 8hr (10pm-6am)	51.7
Leq 15hr (7am-10pm)	59.8
Leq 9hr (10pm-7am)	53.0

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

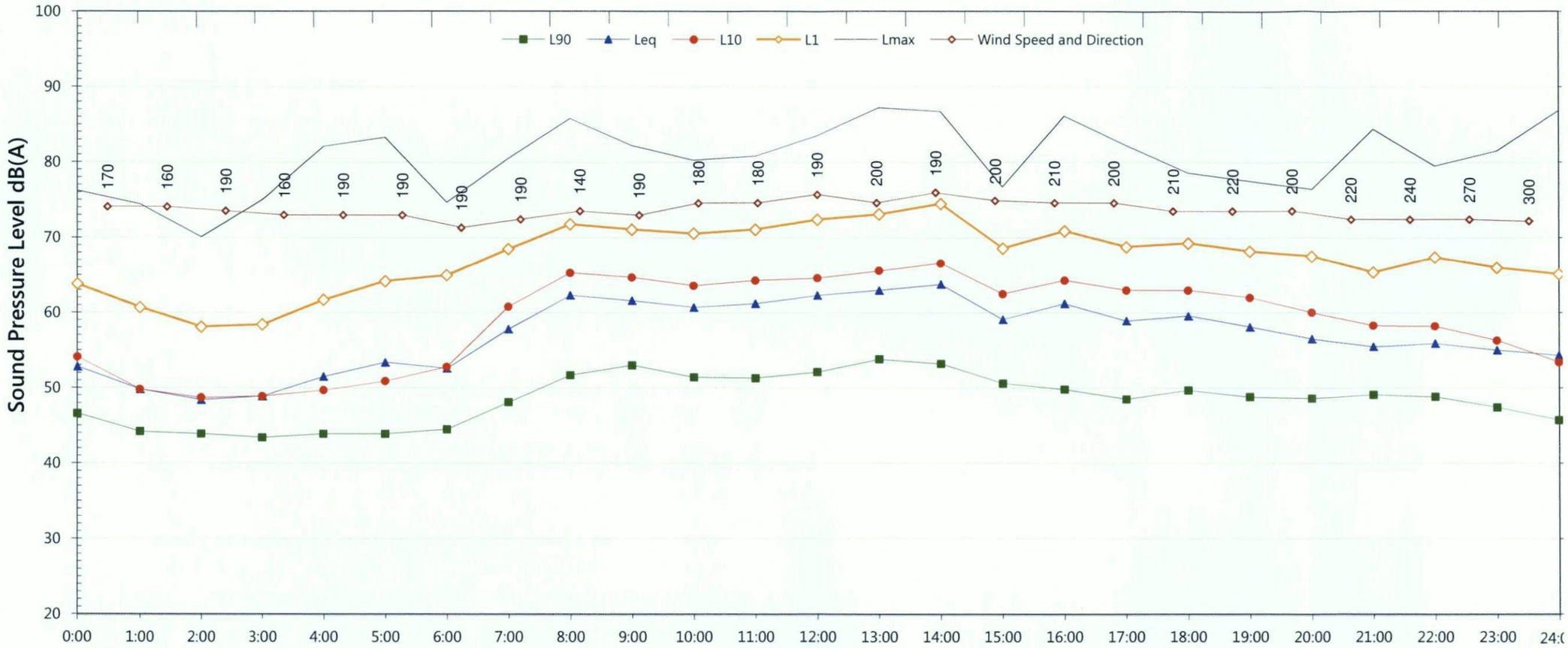
Data File: MB580-01L01 34 Breese St (r0)

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Unattended Noise Monitoring Results

34 Breese Street

Thursday, 23 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	51.4	48.8	45.4
Leq[3]	59.5	54.6	52.6

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	70.5	to	86.8
Lmax - Leq (Range)	21.7	to	32.5

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	62.0
L10 12 hr (6am-6pm)	64.0
Leq 16hr (6am-10pm)	60.5
Leq 8hr (10pm-6am)	53.5
Leq 15hr (7am-10pm)	60.6
Leq 9hr (10pm-7am)	54.6

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

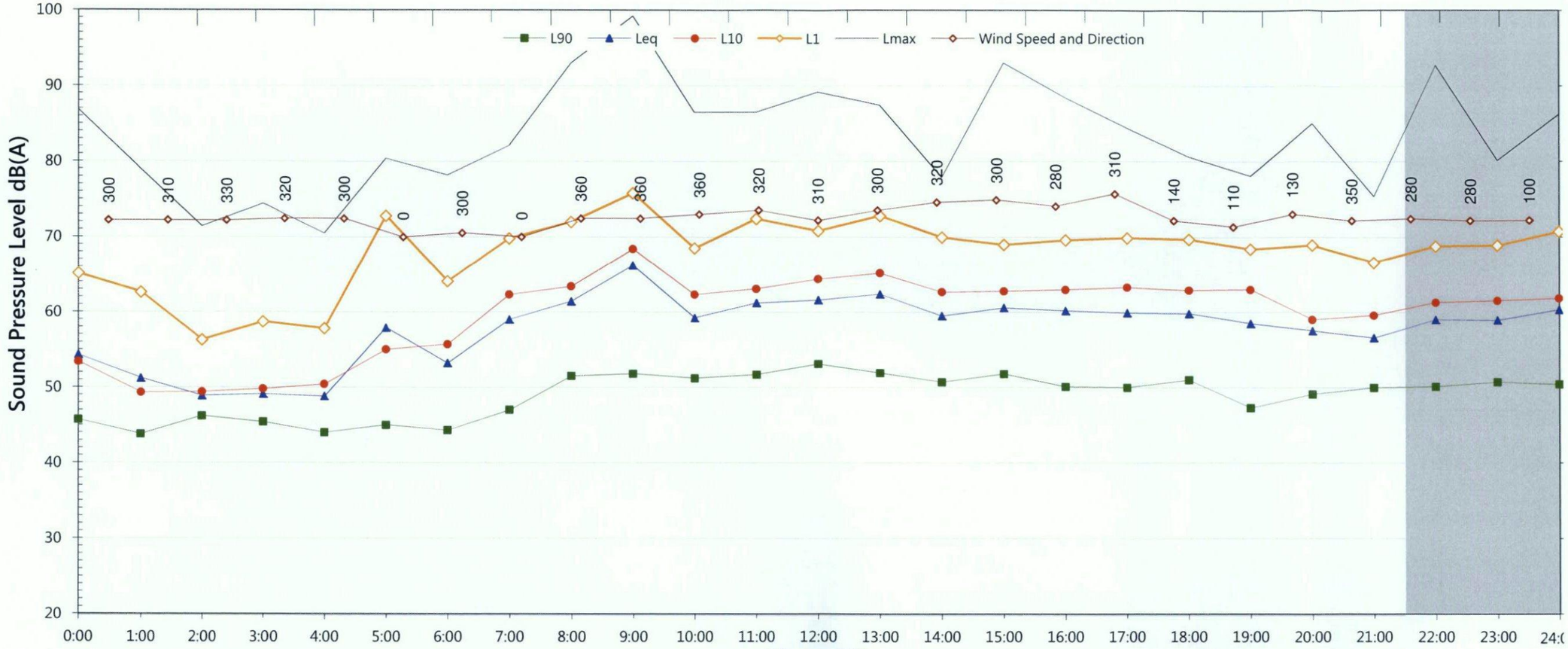
Data File: MB580-01L01 34 Breese St (r0)

QTE-26 (rev 1) Logger Graphs Program

Unattended Noise Monitoring Results

34 Breese Street

Friday, 24 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	51.3	48.8	45.9
Leq[3]	59.6	55.6	50.6

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	71.4	to	85.6
Lmax - Leq (Range)	21.0	to	31.5

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	63.0
L10 12 hr (6am-6pm)	63.7
Leq 16hr (6am-10pm)	60.9
Leq 8hr (10pm-6am)	-
Leq 15hr (7am-10pm)	61.0
Leq 9hr (10pm-7am)	-

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

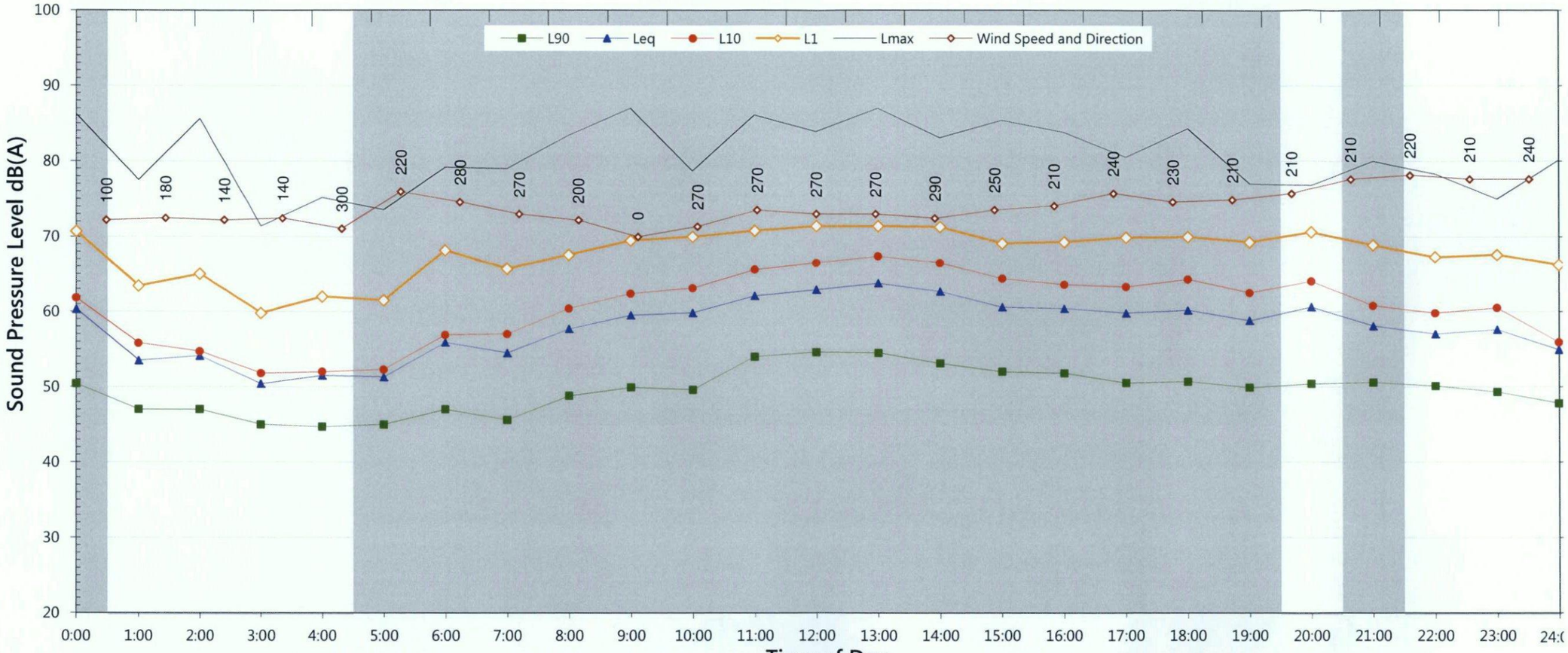
Data File: MB580-01L01 34 Breese St (r0)

QTE-26 (rev 1) Logger Graphs Program

Unattended Noise Monitoring Results

34 Breese Street

Saturday, 25 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	-	50.3	46.1
Leq[3]	-	57.2	51.5

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	72.2	to	84.0
Lmax - Leq (Range)	17.4	to	28.9

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	-
L10 12 hr (6am-6pm)	-
Leq 16hr (6am-10pm)	-
Leq 8hr (10pm-6am)	53.8
Leq 15hr (7am-10pm)	-
Leq 9hr (10pm-7am)	53.5

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

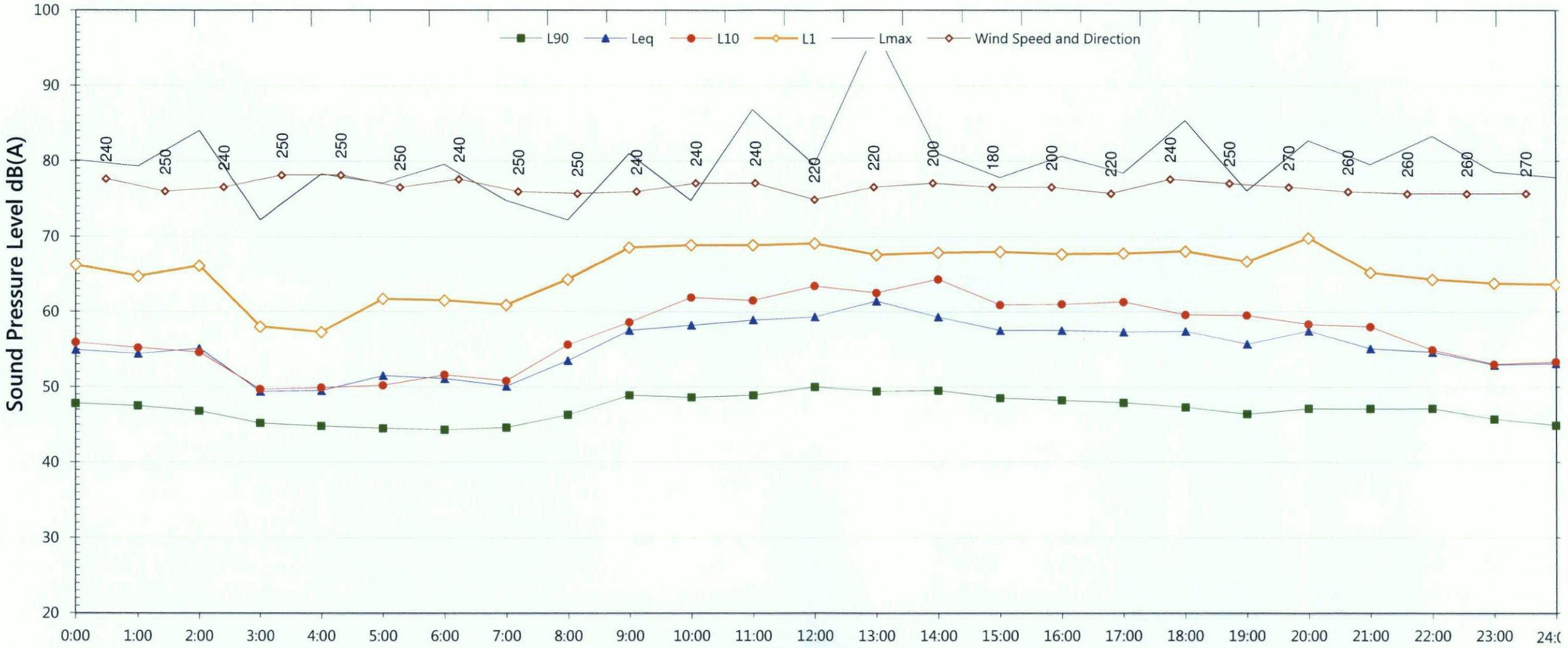
Data File: MB580-01L01 34 Breese St (r0)

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Unattended Noise Monitoring Results

34 Breese Street

Sunday, 26 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.5	46.9	44.4
Leq[3]	56.3	53.8	49.5

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	71.2	to	84.3
Lmax - Leq (Range)	23.1	to	31.8

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	58.8
L10 12 hr (6am-6pm)	60.1
Leq 16hr (6am-10pm)	57.6
Leq 8hr (10pm-6am)	51.5
Leq 15hr (7am-10pm)	57.8
Leq 9hr (10pm-7am)	51.5

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Notes:

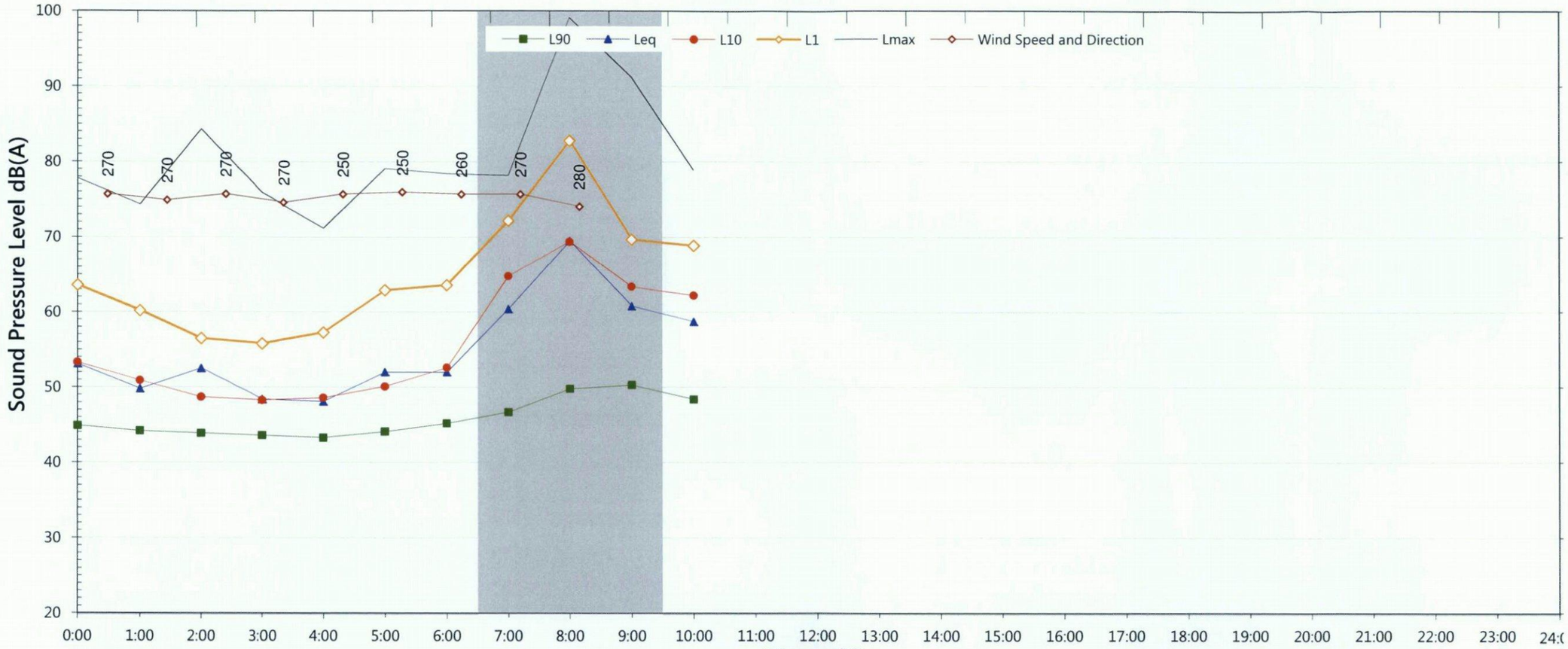
1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

Data File: MB580-01L01 34 Breese St (r0) QTE-26 (rev 1) Logger Graphs Program

Unattended Noise Monitoring Results

34 Breese Street

Monday, 27 April 2015



EPA SEPP N1 Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.4	-	-
Leq[3]	56.7	-	-

Night Time Maximum Noise Levels, dB(A)			(see note 4)
Lmax (Range)	-	to	-
Lmax - Leq (Range)	-	to	-

VicRoads Traffic Noise Reduction Policy	(see note 3)
Descriptor	dB(A)
L10 18 hr (6am-12am)	-
L10 12 hr (6am-6pm)	-
Leq 16hr (6am-10pm)	-
Leq 8hr (10pm-6am)	-
Leq 15hr (7am-10pm)	-
Leq 9hr (10pm-7am)	-

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Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured in free-field; tabulated results facade corrected
4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax- Leq ≥ 15dB(A)

Data File: MB580-01L01 34 Breese St (r0)

QTE-26 (rev 1) Logger Graphs Program

APPENDIX C Risk Tables

H	TABLE A1 - RISK ANALYSIS – FAÇADE DESIGN FOR NOISE INGRESS					
No	Item of Risk	Analyse Risk	Level	Treat Risk	Risk Allowance	
					Recom-mended	Used on this Project
	The design offered in this report assumes a number of factors which are outside the control of the designer:	The client should be aware that the design tolerance chosen may not be adequate and some remedial measures may be required including, for example, increasing the height of the noise barriers, the provision of additional silencing treatment or limitations in the time of use of equipment.	MED	In order to reduce the risk of noise levels not complying with the design criteria, the following risk-reducing measures have been implemented or are recommended:		
	Variability of Source Noise Levels	Source noise levels may vary and an appropriate level of uncertainty results.		If the source noise level varies then apply one standard deviation. If the client relies on the noise data as being guaranteed by the supplier then the appropriate risk allowance is 0dB(A). We have assumed the latter. The client may instruct Renzo Tonin & Associates to adopt a higher or lower design tolerance.	NA	NA
	Engineering Design	Modelling and calculating sound levels contain inaccuracies, for example, design assumptions relating to sound propagation on the site (including reflections from nearby buildings and surfaces).		A design tolerance of 3dB(A) is allowed in the final calculated sound level. The client may instruct Renzo Tonin & Associates to adopt a higher or lower design tolerance. Consider relocation of the plant to a location which minimizes the risk.	3	3
	Background/ Ambient Noise Levels	Noise testing has not been conducted therefore only in-principle advice has been given.		Undertake background/ ambient noise level measurements to confirm the noise goals.	See 'Treat Risk'	See 'Treat Risk'

EXPLANATION OF TABLE

The designs offered in this report assume a number of factors which are outside the control of Renzo Tonin & Associates.

The client accepts the risks identified in this document and is encouraged to minimize those risks by the methods described above.

The column marked "Level" identifies the level of risk as HIGH, MED, LOW or N/A. Where the risk is HIGH, the client is advised that if the design does not comply with the selected standards then the client may experience significant additional costs and delays in rectification works. Where the risk is MED, the client is advised that if the design does not comply with the selected standards then the client may experience some additional costs and/or delays in the rectification works. Where the risk is LOW, the client is advised that if the design does not comply with the selected standards then the client may experience delays in the rectification works. Where N/A is indicated, this means the item is not applicable to the project.

6

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RESIDENTIAL DEVELOPMENT
34 BREESE STREET, BRUNSWICK

SUSTAINABILITY MANAGEMENT PLAN (SMP)

RECEIVED
URBAN DEVELOPMENT
26 OCT 2015
MORELAND CITY COUNCIL

Date: 12 October 2015

Document Number: 7571-004

DOCUMENT ISSUE REGISTER

PROJECT: 34 Breese Street, Brunswick

PROJECT REF: LCE7571-004 Sustainable Management Plan

REVISION	DESCRIPTION	DATE ISSUED	AUTHOR	REVIEWED
A	Town Planning Issue	29.10.2013	PS	
B	Revised for Endorsement	12.10.2015	MH	NHA

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1. EXECUTIVE SUMMARY

This report provides an overview of the sustainability initiatives that have been assessed for inclusion in the proposed development located at 34 Breese Street, Brunswick. The development comprises a five storey apartment building, with ground floor car parking. The development is located within the City of Moreland.

The sustainability initiatives proposed have a focus on 'passive' design techniques, which allow for year round sustainability with minimal to zero on-going costs or occupant input. 'Active' sustainability design techniques are also included to ensure that operational sustainability is adequately addressed. Additionally, targets are placed on the usage of materials and construction techniques to ensure the development is constructed in a sustainable manner.

This report references various sustainability frameworks, checklists and benchmarks, all of which were used to form the basis of, and to develop the initiatives. The result has led to a set of initiatives tailored specifically to this development, yet benchmarked against similar developments to demonstrate the proposed levels of sustainability.

The development has achieved a high level of energy efficiency through the use of high thermal performance glazing, solar boosted hot water, inverter heat pump air conditioning systems and a high level of insulation performance. Additionally, the apartment layouts and façade design promote natural lighting and natural ventilation.

Sustainable forms of transport are also accounted for, with the development having close access (100m) to Anstey train station and trams on Sydney Road (200m). The development also provides dedicated secure storage space for bicycles, to allow residents to use more sustainable forms of transport.

The development incorporates a rainwater tank for capture/res-use of rainwater (for planter boxes throughout the development – approximately 22m^2 of irrigation), and also proposes to use water efficient features such as fittings with high WELS ratings. As such, the development is shown to have significant reduced reliance on mains water systems, as compared with typical residential dwellings of similar use.

The development utilises Sustainable Tools for Environmental Performance Strategy (STEPS) and the National Construction Code (NCC) as benchmarks for sustainability performance. This report provides a summary of the STEPS results, as well as the input data used (in the appendix). The report also presents the preliminary NatHERS ratings, which demonstrates that compliance with the NCC's 6 star (average) rating for Victoria is achieved.

This Sustainability Management Plan forms part of the head contract. All initiatives listed in this report are to be annotated on the construction architectural drawings, to be signed off by the ESD consultant. It is the responsibility of the builder that all works must be undertaken in accordance with the endorsed version of this report. No alterations may occur without the written consent of Moreland City Council.

2. INTRODUCTION

2.1 DESCRIPTION OF DEVELOPMENT

34 Breese Street consists of a five story residential apartment building, comprising 18 apartments and ground level car parking.



Location of Proposed Development



Image of Proposed Development

2.2 SUSTAINABILITY FRAMEWORK

Sustainability is a term that is typically used to describe the intent to balance the elements of society, economics and the environment. This report focusses primarily on the ecologically sustainable development (ESD) initiatives for the proposed development and it is considered that social and economic aspects are also addressed either directly or in-directly where relevant.

The development adopts good passive design principles and building services to achieve sustainable outcomes using simplistic, practical, low maintenance and cost effective design concepts.

The following table summarises the environmental framework, benchmarks and design outcomes of the project:-

Sustainability Assessment Framework	Demonstration of Project Compliance
▪ Moreland City Council ESD Framework ▫ Sustainable Design Assessment in the Planning Process ▪ FirstRate5 (Sustainability Victoria) ▪ Sustainability Tools for Environmental Performance Strategy ▪ Melbourne Water's STORM Rating System	▪ Energy efficient design (Thermal massing, façade shading, natural ventilation, natural light, high NatHERS ratings) ▪ High indoor environment quality design (natural ventilation, natural light harvesting) ▪ Water efficient design (WELS rated fixtures) ▪ Rainwater capture and re-use ▪ Provision of parking/storage for sustainable methods of transport, development well serviced by public transport. ▪ Achieving best practice STEPS ratings and NatHERS ratings

2.3 STEPS AND STORM

STEPS is a web based ESD rating tool developed by Moreland City Council, to assess the environmental performance of a planned development. The tool generates a report based on user inputs, and awards a score for five of the most critical elements in constructing environmentally sustainable dwellings. The five elements include greenhouse emissions from operating energy, peak energy use, mains (drinking) water use, stormwater quality impacts, and building materials impacts. The program also calculates the number of bicycle places required and the area need to provide for waste recycling services. STEPS references and utilises other ESD tools such as House Energy Star Ratings and Melbourne Water's Stormwater Treatment Objective – Relative Measure (STORM) calculator.

It was decided to use STEPS as part of this sustainable design assessment for this development as the tool can effectively rate residential developments and return a simple numerical result displaying how well the development meets the required sustainability initiatives. The result of the rating for 34 Breese Street is shown in the following table. The development has scored well in all categories indicating that a sustainable result is achievable. It is further considered that the apartments also perform environmentally well from a passive design standing, by significantly exceeding benchmarks for peak energy usage. The table below also displays the standard required scores for each STEPS element:

STEPS Element	Standard Required Score	34 Breese Street
Greenhouse Gas Emissions	25	43
Peak Energy Usage	10	81
Mains Water Usage	25	44
Stormwater Quality	100	109
Building Materials	12	13
Total		290/500

3. SUSTAINABILITY INITIATIVES

The below table summarises the ecologically sustainable design (ESD) initiatives proposed to be included for the development at 34 Breese Street, Brunswick.

Category	Description	Proposed Initiative	Comments
1. Indoor Environment Quality	To achieve a healthy indoor environment quality for the wellbeing of building occupants.	1. Provision of sufficient daylight to habitable rooms	All habitable rooms in apartments have direct access to windows/light courts to allow for the ingress of natural light.
		2. Window sized to balance daylight and heat gain/loss.	Windows are sized to appropriately balance daylight ingress and heat gain/loss - windows to be sized to approx. 20% of total apartment floor area.
		3. Limited single aspect south facing apartments	The development has no single aspect south facing dwellings
		4. Natural ventilation is to be provided	All apartments have operable windows and sliding doors opening directly to outside to provide natural ventilation. Apartments also have access to cross ventilation.
		5. Acoustics	Windows are provided with glazing reviewed by an acoustic consultant.
		6. Internal lighting	Lighting in apartments will be provided with high colour rendition index and warm white colour to increase occupant comfort levels within apartments.
		7. Exhaust ventilation	Apartment bathroom and kitchen exhaust to balconies for discharge to ambient in-lieu of recirculating range hood type kitchen hood.
		8. External shading	Shading is provided without compromising natural light/external views.
2. Energy Efficiency	To ensure the efficient use of energy, to reduce total operating greenhouse emissions and to reduce peak	1. Provision of external Shading	Apartments are provided with external shading to reduce excessive heat gain during summer.
		2. Apartments to achieve minimum NatHERS rating of 6 Stars (average)	The apartments are to satisfy the NatHERS requirements as per the National Construction Code.

Category	Description	Proposed Initiative	Comments
	demand	3. Natural lighting to reduce reliance on artificial lighting	All habitable rooms in apartments have direct access to windows/natural light, reducing the reliance on artificial lighting.
		4. High efficiency light fittings	The development is to incorporate high efficiency light fittings coupled with time switches, motion sensors and daylight sensors where applicable, to ensure that lighting energy consumed is minimised.
		5. Solar boosted gas-fired domestic hot water	All apartments will receive hot water via a 20% solar contribution gas-fired system.
		6. Energy efficient air conditioning systems	Space heating and cooling is to be provided via heat pump A/C with minimum 5 star energy rating, or equivalent CoP where star rating is not available.
		7. Energy Efficient Car Park Ventilation	The car park is either to be naturally ventilated, or ventilated via an exhaust fan with a variable speed drive + carbon monoxide sensor.
		8. Master off switches	All apartments are to include a single 'Master-Off' switch, which when switched is to switch off all lighting and air conditioning, such that occupants can ensure when they leave the apartment all unnecessary lights/air conditioning is switched off.
		9. Metering of incoming energy streams	Both gas usage and electricity will be separately metered.
3. Water Efficiency	To ensure the efficient use of water, to reduce total operating potable water use and to encourage the appropriate use of alternative water sources	1. WELS ratings	All fittings and fixtures are to be installed with a WELS rating within one star of the highest available.
		2. Rainwater re-use	It is proposed to install a rainwater capture/re-use system capable of storing 3kL. Rainwater is to be reticulated to 20 apartment toilets for re-use as well as for irrigation of planter boxes (approximately $22m^2$).
		3. Metering of water usage	All apartments are to have individual water metering.

Category	Description	Proposed Initiative	Comments
4. Stormwater Management	To reduce the impact of stormwater run-off, to improve the water quality of stormwater run-off, to achieve best practice stormwater quality outcomes and to incorporate the use of water sensitive urban design, including rainwater re-use.	1. Water Sensitive Urban Design	Victoria's Best Practice Stormwater Management (STORM rating) is to be exceeded.
		2. Rainwater capture	Rainwater tanks are to be installed to reduce run off.
5. Building Materials	To minimise the environmental impacts of materials used by encouraging the use of materials with a favourable lifecycle assessment	1. Limited usage of high embodied energy metals and materials (such as zinc, aluminium etc.)	The project will aim to minimise usage of high embodied energy metals and materials where applicable.
		2. Recyclable/Re-usable materials	Materials used within the project will be selected to be recyclable/re-usable where applicable.
		3. Toxic materials	The project is to avoid the use of materials which are toxic in manufacture or use where feasible.
		4. Locally sourced materials	In general, products which are locally manufactured are to be sourced and implemented where feasible. Products which are sourced from overseas are to be shipped in lieu of transportation by air where feasible.
6. Transport	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	1. Bicycle Parking	The development is provided with secure bicycle parking for residents.
		2. Public Transport	The development is well serviced by nearby public transport.
		3. Nearby recreational facilities	The development has nearby recreational facilities.
7. Waste Management	To ensure waste avoidance reuse and recycling during the construction and operation stages of development	1. Construction waste recycling	A recycling target of 70% of all demolition and construction waste (by mass) is proposed to ensure that all materials collected which are appropriate for reuse are suitably recycled, in-lieu of being disposed of in landfills.

Category	Description	Proposed Initiative	Comments
		2. Occupant waste separation	The development is proposed to include a separate general waste and recycle disposal point, to allow for occupants to dispose of their waste correctly.
		3. Waste management Plan	Completion of a Waste Minimisation Plan for Construction and Demolition works, to ensure material waste during construction is recycled/re-used where feasible.

4. APPENDICES

4.1 PRELIMINARY NATHERS ASSESSMENT

We provide the following preliminary National House Energy Rating Scheme (NatHERS) assessment for the proposed development. This assessment has been completed to demonstrate that the development is capable of achieving a NatHERS rating of 6.0 stars, for town planning purposes only. Construction details and glazing types will require re-confirmation for building permit purposes.

The assessment has been undertaken utilising the FirstRate V5.1.9c computer software, formally recognised as "Second Generation Software" in accordance with Australian Building Codes Board protocol.

The table below summarises the details of the inputs used in the model.

Building Element	Construction Details
General	Air Conditioning – one split system per apartment • Kitchen/living areas • Bedrooms (secondary 'borrowed' air conditioning only – indoor unit to be located within the kitchen/living areas) Sealed Exhaust Fans in the following room types: • Bathrooms • Kitchens No ceiling fans No vented down lights
Glazing Construction	General • Weather Stripped • Window heights 2.4m unless otherwise stated • Window widths as shown on plans unless otherwise stated. Aluminium improved framed, double glazed, clear/6mm air gap/clear, low-e: Whole Window System Thermal Transmission Coefficient = 6.95 W/m^{2}K, Whole Window System SHGC = 0.68 W/m^{2}K, Applied to the following apartments: • Level 1 – NW & W • Level 2 – NW & W • Level 3 – NW & W • Level 4 – S & W Aluminium framed, double glazed, clear/6 mm air gap/clear, low-e glass: Whole Window System Thermal Transmission Coefficient = 4.95 W/m^{2}K, Whole Window System I SHGC = 0.69 W/m^{2}K, Applied to the following apartments:

	• Level 1 - NE • Level 2 – SW • Level 3 – SE & SW
	Aluminium framed, single glazed, low-e glass: Whole Window System Thermal Transmission Coefficient = 5.32 W/m^{2}K, Whole Window System SHGC = 0.47 W/m^{2}K, Applied to the following apartments: • Level 1 – SE & SW • Level 2 – NE & SE • Level 3 – NE • Level 4 - N
Door Construction	Internal • 2.1 m high Wall open to hall • 2.1 m high, • Weather stripped
Floor Construction	Concrete_Slab Insulation • R2 to elevated slab and slab above uninsulated space • No insulation between floors Floor Coverings • Carpet to bedrooms • Floating timber to kitchen and living areas • Tiles to bathrooms
Wall Construction	External wall • 125 mm precast concrete wall, • 3.4m high to level 4, • 3 m high to all other levels, • R 2.3 insulation, • Colour (darkness): Medium. Internal wall partition • Plasterboard stud wall, • 2.8 m high. Wall Partition Construction Between Apartments, • 125 mm precast concrete wall,

	• 2.8 m high.
Roof Construction	Between Floors • Suspended concrete slab. Roof (Level 4 and some of level 3) • Suspended concrete slab, • R 3.0 insulation • Colour (darkness): Medium

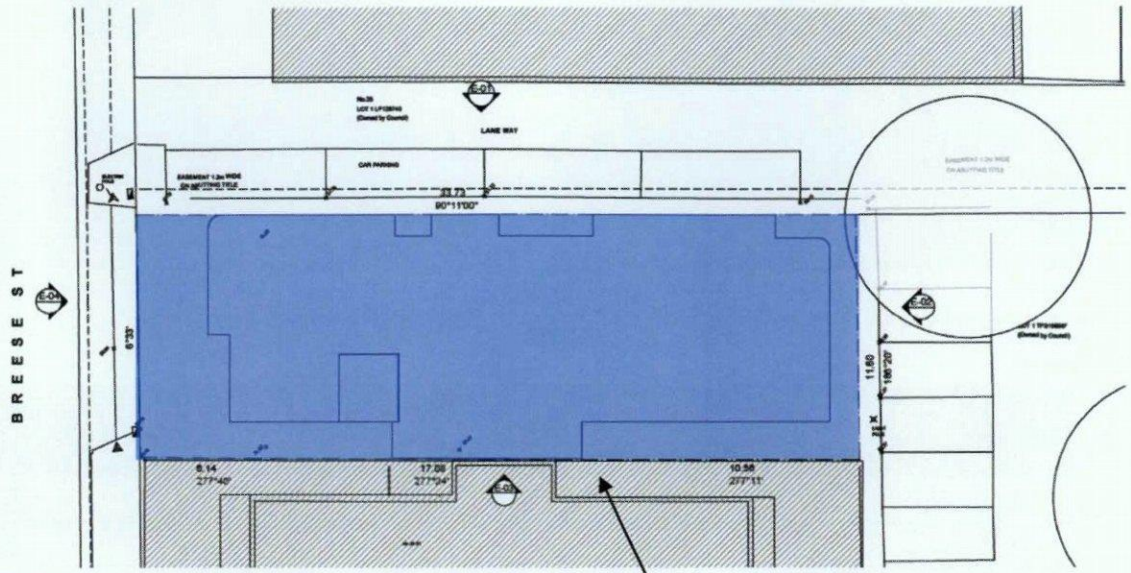
The following table presents the predicted star ratings achieved for each apartment.

Apartment		Total Energy	Net Conditioned	Stars
Level	Direction Facing	MJ/m²	Floor Area m²	
1	NW	117.7	48.7	5.8
1	NE	90.0	36.2	6.7
1	SE	111.8	35.2	6.0
1	SW	113.4	51.6	6.0
1	W	138.1	34.6	5.3
2	NW	93.6	48.7	6.6
2	NE	91.5	36.2	6.7
2	SE	108.4	35.2	6.1
2	SW	98.6	51.6	6.4
2	W	138.2	34.6	5.3
3	NW	104.8	48.6	6.2
3	NE	105.0	16.1	6.2
3	SE	103.1	35.2	6.3
3	SW	107.5	51.7	6.2
3	W	139.5	34.6	5.2
4	N	105.7	58.0	6.2
4	S	122.5	54.1	5.7
4	W	144.6	42.5	5.1

Predicted Average Rating
6.0

In accordance with the 2012 BCA, a minimum rating of 5.0 stars is required for each apartment and a minimum average building rating of 6.0 stars is achieved.

4.2 RAINWATER COLLECTION LAYOUT



4.3 STEPS AND STORM ASSESSMENT

The STEPS and STORM assessment outputs are shown on the following pages.

STEPS v5.0 Report

Revision Timestamp: 2015-10-12 13:35:23

Base Project ID: 20391

Revision: 9984a74a4d2394e70a3652d9872f3c84

Project Details

Read the Guide to using STEPS before you begin an assessment

Project name	34 Breese Street
Assessor	Matt Hill
Contact email address	matthew.hill@lucidconsulting.com.au
Street number and name	34 Breese
Street type	Street
Suburb	Brunswick
Postcode	3016
Municipality	Moreland City Council
Permit number	
Applicant	

Land size	407 m^2
Type of residence	Apartment
Number of bedrooms	28
Total number of apartments (multi-unit developments only)	18

Disclaimer: ☑

The Moreland City Council does not accept any liability for loss or damages incurred as a result of reliance placed upon STEPS. STEPS is provided on the basis that all persons using STEPS undertake responsibility for assessing the relevance and accuracy of its content. Council takes no responsibility for any

information or services on external websites linked to from this website.

STEPS predicts the environmental impacts of the development based on assumed usage patterns and long term climate. Actual environmental impacts will depend on actual building and appliance use patterns and efficiency as well as future climate. Information about environmental impacts should therefore be taken as indicative only and no guarantee is implied.

The Centre for Design at RMIT University makes no claim as to the accuracy or authenticity of the content of the materials element of STEPS, and does not accept liability to any person for the information or advice provided in it or incorporated into it by reference

Energy

For more information on products available for selection please see the Energy Appliances website.

Enter data and features of the average dwelling in the development.

Building Envelope Energy Rating heating score	113	MJ per m^2
Building Envelope Energy Rating cooling score	89.9	MJ per m^2
Building Envelope Energy Rating conditioned area	17.5	m^2
Building Envelope Energy Rating energy star rating	6	stars
Heating system type	Reverse Cycle heating 5 star ▼	
Heating system options	Room/Space Heating Only ▼	
Cooling system type	Air-Conditioning, 5 stars ▼	

Cooling system options	Room/Space Cooling Only
Water heater type	Gas boosted solar < 80% Solar Contribution
Lighting in living areas	LED Downlights / Spotlights
Clothes-drying facility	No provision for drying space
Renewable Electricity Generation	
Renewable System Size	kW (kilowatt peak output)

Output

Energy

Score **43**



0 equals the estimated average performance of a conventional design

Required Score	**25**	**%**
Project Score	**43**	**%**
Benchmark Emissions	**7810**	**kg CO_2 / yr / dwelling**
Target Emissions	**5858**	**kg CO_2 / yr / dwelling**
Heating Greenhouse Gas Emissions	50	kg CO_2 / yr / dwelling
Cooling Greenhouse Gas Emissions	80	kg CO_2 / yr / dwelling
Water Heating Greenhouse Gas Emissions	206	kg CO_2 / yr / dwelling
Lighting Greenhouse Gas Emissions	32	kg CO_2 / yr / dwelling
Clothes Drying	162	kg CO_2 / yr / dwelling
Misc incl TV, cooking, refrigerator, computer	3910	kg CO_2 / yr / dwelling
Minus Renewable Electricity Generation	-0	kg CO_2 / yr / dwelling
Total Emissions	**4440**	**kg CO_2 / yr / dwelling**

Peak Demand

Output

Peakdemand

Score **81**



0 equals the estimated average performance of a conventional design

Required Score	**10**	**%**
Project Score	**81**	**%**
Benchmark Peak Demand	**2**	**kW**
Target Peak Demand	**2**	**kW**
Calculated Peak Demand	**0.4**	**kW**

Water

For more information on products available for selection please see the WELS website.

Fittings (for the average dwelling)

Shower type	3 Star WELS (> 4.5 but <= 6.0)
Toilet	5 Star WELS rating
Basin taps	5 Star WELS rating
Bath type	

Re-use (for the whole building)

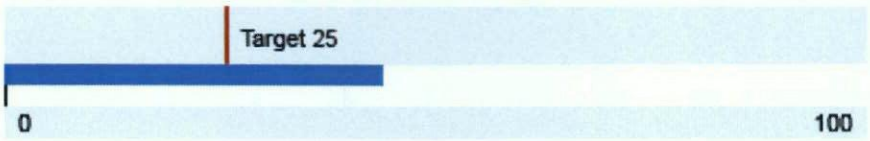
Rainfall area	Melbourne (Central/North)	
Rainwater collection tank size	3000	L
Area of roof draining to rainwater tank	407	m^2
Comments on rainwater tank		
Alternative water supply other than rainwater tanks used (e.g. greywater, third pipe connection or on-site wastewater treatment and reuse)	☐ Yes	
Type of alternative water supply		
Are toilets permanently connected to the rainwater tank/alternative water source?	☑ Yes	
... and also, number of toilets connected to rainwater tank	20	
Is the irrigation system permanently connected to the rainwater tank/alternative water source?	☑ Yes	
Is the washing machine(s) permanently connected to the rainwater tank?	☐ Yes	

Is the hotwater services(s) permanently connected to the rainwater tank?	☐ Yes	
Irrigated garden area	0	m^2

Output

Water

Score **44**



0 equals the estimated average performance of a conventional design

Required Score	**25**	**%**
Project Score	**44**	**%**
Benchmark Mains Water Consumption	**137**	**kL / yr / dwelling**
Target Mains Water Consumption	**102**	**kL / yr / dwelling**
Shower	20.4	kL / yr / dwelling
Bath	0.0	kL / yr / dwelling
Misc hot water	30.7	kL / yr / dwelling
Toilet flushing	8.2	kL / yr / dwelling
Basins	3.8	kL / yr / dwelling
Evaporative cooler	0.0	kL / yr / dwelling
Irrigation	0.0	kL / yr / dwelling
Misc other water use	14.8	kL / yr / dwelling
Total water consumption	**77.9**	**kL / yr / dwelling**
Re-used toilet flushing	2.0	kL / yr / dwelling
Re-used Irrigation	0.0	kL / yr / dwelling
Re-used Laundry	0.0	kL / yr / dwelling
Re-used Hot Water Service	0.0	kL / yr / dwelling
Re-used Total	**2**	**kL / yr / dwelling**
Toilet usage from mains	6.2	kL / yr / dwelling
Irrigation usage from mains	0.0	kL / yr / dwelling
Misc other usage from mains	14.8	kL / yr / dwelling
Total hot water usage from mains	51.1	kL / yr / dwelling
Total usage from mains	**75.9**	**kL / yr / dwelling**

Stormwater

Read the Guide to STORM before you begin an assessment

Please visit the STORM website to obtain your STORM Score.

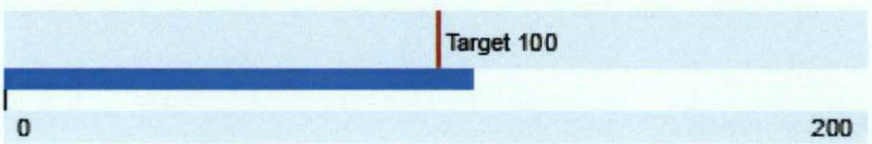
Enter STORM Score From Website 109

Should MUSIC be used instead of STORM? ☐ Yes

Output

Stormwater

Score **109**



0 is equivalent to the typical urban pollutant loads

Required Score	**100**	**%**
Project Score	**109**	**%**
Best-Practice On-Site Stormwater Treatment	**100**	**%**

Materials

Read the Moreland Greenlist before you begin an assessment

Building Element	**Material**	**Points**
Ground Floor		
Material 1	Standard Concrete Slab ▼	10.8
Material 2	▼	
Material 3	▼	
Ground Floor Material average		**10.8**

Upper Floors

Material 1	Standard Concrete Slab	3.0
Material 2		
Material 3		
Upper Floors Average		**3.0**

Wall Framing

Material 1	Tilt-Slab	8.4
Material 2		
Material 3		
Wall Framing Average		**8.4**

Interior Wall Framing

Material 1	Timber Frame	7.0
Material 2		
Material 3		
Interior Wall Framing Average		**7.0**

Wall Cladding

Material 1	FC Sheet	11.7
Material 2		
Material 3		
Wall Cladding Average		**11.7**

Windows

Material 1	Aluminium	3.0
Material 2		
Material 3		
Windows Average		**3.0**

Roof Framing

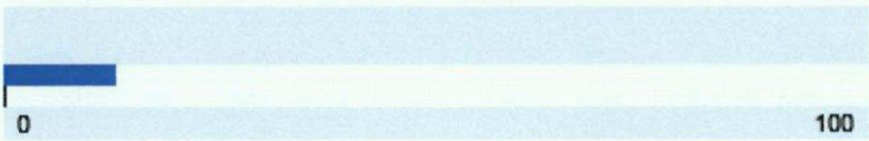
Material 1	Steel frame	2.2
Material 2		

Material 3		
Roof Framing Average		**2.2**
Roof Cladding		
Material 1	Concrete tile	4.9
Material 2		
Material 3		
Roof Cladding Average		**4.9**
Outdoor Structures		
Material 1	Timber - Other	2.5
Material 2		
Material 3		
Outdoor Structures Average		**2.5**
TOTALS:		**53.5**

Output

Materials

Score **13**



0 equals the estimated average performance of a conventional design

Required Score	**11**	**%**
Project Score	**13**	**%**
Benchmark Materials Impact	**47.8**	**points**
Target Materials Impact	**52.65**	**points**
Project Materials Impact	**53.5**	**points**

Note:

Points are derived from materials' fate, embodied energy, biodiversity, human health and toxicity. Target is dependant on the specified building elements

Report

Project Details

Contact	matthew.hill@lucidconsulting.com.au
Project	34 Breese Street Brunswick 3016
Municipality	Moreland
Permit number	
Land size	407 m^2
Type of residence	Apartment
Total number of bedrooms	28
Total number of apartments (multi-unit developments only)	18

Name	Required Score	Project Score
Greenhouse Emissions from Energy Use	25%	43%
Peak Energy Use	10%	81%
Mains (Drinking) Water Use	25%	44%
Stormwater Quality Impacts	100%	109%
Building Material Impacts	11%	13%
Waste Management - recyclables	13.50 m^2	
Waste Management - rubbish	4.50 m^2	
Waste Management - green waste	0.25 m^2	
Waste Management - TOTAL	18.25 m^2	
Transport: Secure bicycle parks required	20	
Project sustainability score		**290 / 500**

Upon completion of a STEPS assessment, prior to submission for a planning permit: print all pages of the assessment and ensure that the following are notated on the plans for endorsement (where applicable):

Energy

- fixed clothes drying racks; and
- the location of hot water systems (including marking solar panels on roof.)
- specifications used to achieve a 5-star FirstRate rating eg insulation and aluminium improved window framing;
- air-conditioning system and heating system types; and

- specified lighting types.

Water

- the rainwater tank, sized, and showing plumbing from the roof and to the toilets and/or garden.
- specified shower, toilet and basin types.

Stormwater

- the location, size and type of treatment systems;
- permeable paving areas;
- the proposed drainage to the treatment system; and
- section details, planting schedules and maintenance requirements of treatment types.

Materials

- material types.

Transport

- allocated bicycle parking spaces.

Waste

- allocated space for waste management.

Complete :

- an operational waste management plan for the site.

Innovation

Local Government encourages developers to consider inclusion of innovative environmental design solutions that may not be specified in STEPS. Should you wish to include additional environmentally sustainable design features in your proposed development, please notate them appropriately on the plans and include relevant design details in the planning application documentation.

Melbourne Water STORM Rating Report

ısactionID:	276602
icipality:	MORELAND
ıfall Station:	MORELAND
·ess:	34 Breese St
	Brunswick
	VIC 3016
ɜssor:	MH
ɜlopment Type:	Residential - Multiunit
ment Site (m2):	407.00
ıRM Rating %:	109

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank W: Suppl Reliabilit
f + Terrace	407.00	Rainwater Tank	3,000.00	20	108.90	54.0(

ɜ Generated: 12-Oct-2015 Program Version: 1