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REPORT No. 002 R03 2007118

PROJECT: 173-199 ELIZABETH STREET
PROPOSED RESIDENTIAL DEVELOPMENT
ENVIRONMENTAL NOISE ASSESSEMENT

CLIENT: Urbex Pty Ltd
Level 1
24-30 Camberwell Road
Hawthorn East Vic 3123

ATTENTION: Mr Tim Mills

DATE: 28 October 2009

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TABLE OF CONTENTS

Page No.

DOCUMENT STATUS

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-	Issued to client	16 July 2008
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1.0 INTRODUCTION

A parcel of land previously occupied by the Kodak factory at 173-199 Elizabeth Street in North Coburg has recently been rezoned from Industrial to Residential 1 with a small area of Business 1. It is proposed to redevelop the site for residential use.

Marshall Day Acoustics Pty Ltd has been requested to conduct an Environmental Noise Assessment for the redevelopment as required by the Moreland Planning Scheme Schedule 10 dated 07 May 2009. The purpose of the assessment is to identify potential noise sources in the area and provided recommendations for noise attenuation measures where appropriate.

Acoustic terminology used throughout this report is included in Appendix A.

2.0 SITE DESCRIPTION

The subject site is situated on a parcel of land located on the eastern side of Edgars Creek in North Coburg, formerly the Kodak factory site.

The site is bounded by:

- Elizabeth Street to the east
- Tilley Street properties to the north
- Boyne and Ronald Streets to the south
- Edgars Creek to the west.

The site has recently been rezoned to Residential 1 (RZ1) with a small section on the Elizabeth Street boundary rezoned to Business 1 (B1Z).

The areas surrounding the subject site are primarily residential and are zoned residential zone 1 (RZ1). The land adjacent to Edgars Creek is public parkland zoned (PRRZ).

The area to the west of Edgars Creek on Newlands Road (also formerly part of the Kodak factory site) is to remain as industrial zoned land (INZ1). It is understood that a food processing and distribution centre/facility will operate in the former Kodak warehouse building. The other industries in the Newlands Road industrial area are the Pronto concrete batching plant to the north and a waste management facility that is located across an empty field on the northern boundary of the Newlands Road industrial area.

An aerial photo showing the location of the site and surroundings is presented in Figure 1.

Figure 1: Site layout

3.0 NOISE ASSESSMENT CRITERIA

The following sections discuss the relevant noise legislation and planning policy requirement for the site.

3.1 SEPP N-1

The Victorian environmental noise policy relating to industrial noise is the *State Environment Protection Policy (Control of Noise from Commerce, Industry, and Trade) No. N-1* (SEPP N-1). Noise emission from plant, equipment, and vehicles on the surrounding commercial and industrial properties would be required to comply with the noise limits of SEPP N-1.

This means that for existing and proposed residential dwellings in the vicinity of the commercial and industrial properties, the commercial and industrial properties would be required by law to introduce noise control measures to meet the SEPP N-1 noise limits.

The assessment of noise emissions under SEPP N-1 is based on the calculation of a noise limit at a receiver position, taking into account the land use in the surrounding area and the ambient noise level. Once a noise limit is established, the noise emission is assessed.

The noise emission from the site, when corrected for duration and character, is referred to as the 'effective noise level'. The effective noise level (L_{eff}) is the adjusted L_{eq} of the noise source or sources measured over a 30 minute period. The predicted effective noise level is compared to the noise limit to determine if noise controls are required to comply with SEPP N-1.

SEPP N-1 separates the day into three different time periods - day, evening and night which are shown in Table 1.

Table 1
SEPP N-1 time periods

Period	Day of week	Time period
Day	Monday-Friday	0700-1800hrs
	Saturday	0700-1300hrs
Evening	Monday-Friday	1800-2200hrs
	Saturday	1300-2200hrs
	Sunday, Public Holidays	0700-2200hrs
Night	Monday-Sunday	2200-0700hrs

A discussion of the site noise limits is presented in Section 6.0.

3.2 Planning Scheme requirements

Clause 22.03 of the Moreland Planning Scheme includes requirements regarding noise sensitive areas included in industrial developments. The following is an extract from the planning scheme:

It is policy that any new or refurbished development or any conversion of part or all of an existing building in any strategic land use category shown on the Industrial Land Use Framework (Map 5) that will accommodate new residential or other noise sensitive uses must:

- *Be designed and constructed to include noise attenuation measures which prevent external noise levels from exceeding that permissible in accordance with Australian Standard AS2107:2000: Acoustics - Recommended design sound levels and reverberation times for building interiors.*
- *Be fitted with a suitable air conditioning and /or ventilation system to Council's satisfaction unless the maximum noise level can be achieved with the windows and doors open.*

It is policy that an application for any new or refurbished development or any conversion of part or all of an existing building in the Transition-Residential and Multi Use Area that will accommodate new residential or other noise-sensitive uses must be accompanied by the following information:

- *A pre-construction noise measurement assessment conducted by suitably qualified engineer which is sufficient in detail and duration to be representative of the noise from the industrial operations which occur in the vicinity of the site. This monitoring shall include sampling during the day, evening and night periods on weekdays and weekends.*

While the above criteria are needed to satisfy council planning requirements, compliance with SEPP N-1 criteria is required by Victorian legislation.

4.0 EXISTING NOISE ENVIRONMENT

Site surveys have identified the following distinct sources of industrial noise that were audible at the subject site:

- Pronto concrete batching plant
- Waste management facility (waste transfer station).

These two industries are closest to the subject site. Noise from other industries in the Newlands Road industrial area was, by comparison, not clearly discernable. The surveys also found that both the batching plant and waste management facility operate during the SEPP N-1 day period and in the early morning part of the night-time period (0530-0700hrs). It is understood that both industries are permitted to operate 24 hours per day. Operations at both sites do not appear to be scaled down or restricted during the night-time period.

The former Kodak warehouse facility is expected to operate in the future as a food processing and distribution facility. During this assessment the warehouse was not in use. Based on the experience of similar warehouse operations, the proximity of the warehouse to the subject site and the warehouse layout, noise levels from the warehouse are not expected to contribute significantly to the overall noise levels at the subject site. However an analysis of the warehouse operations would be required to accurately assess noise emission from this premise.

The following table presents our observations regarding the operating details of the batching plant and waste management facility.

Table 2
Industrial noise sources in the vicinity of the former Kodak site

Industry	Observed noise sources	Distance from subject site boundary	Observed operating periods
Batching plant	Pumps and motors	~400m	0600-1600hrs
	Truck noise		
Waste management facility	Excavator x 1	~450m	0600-1700hrs
	Loaders x 3		
	Truck noise		
	Reversing beepers		

To ensure that the subject site is suitable for residential development, noise from these sources must be attenuated to levels that provide a suitable amenity within and external to the proposed dwellings.

5.0 NOISE MEASUREMENTS

5.1 Background noise levels

A 24 hour noise logging device was placed at the subject site close to the southern boundary of the batching plant from 6-11 June 2008.

Background noise levels for the day, evening and night-time periods were extracted from the logger data during periods when the batching plant and waste transfer station was not operating.

Measured background noise levels are presented in Table 3.

Table 3
Background noise measurements, Kodak site

SEPP N-1 time period	Measured background noise level, L_{90} dBA
Day	43
Evening	41
Night	38

5.2 Noise emissions at subject site and existing residential properties

Measurements of industry noise were taken at the subject site during the SEPP N-1 day, evening and night-time periods. Given the size of the site and the undulating terrain, measurements were taken at a number of locations to determine the variation in noise level with position.

Measurements of industry noise were also taken at a number of existing residential areas during the following time periods:

- Monday, 16 June 2008 between 1830-1930hrs (6:30-7:30pm).
- Tuesday, 17 June 2008 between 0530-0700hrs (5:30-7:00am) and 1400-1500hrs (2:00-3:00pm)
- Friday, 11 July 2008 between 0530-0700hrs (5:30-7:00am).

The spot measurement and logger location are shown in Figure 2.

Figure 2: On site measurement locations

The measurement results indicated the following:

- Noise levels at existing residential properties to the north of the site varied between 45-51dBA
- Noise levels on the subject site varied between 46-49dBA
- Noise levels at existing residential properties to the south varied between 46-49dBA.

6.0 NOISE LIMITS

6.1 SEPP N-1 limits

As stated in Section 3.1, the calculation of noise limits requires the calculation of a zoning level which is based on land use in the surrounding area. The zoning level is then adjusted appropriately, depending on the background noise level. A zoning map is shown in Figure 3.

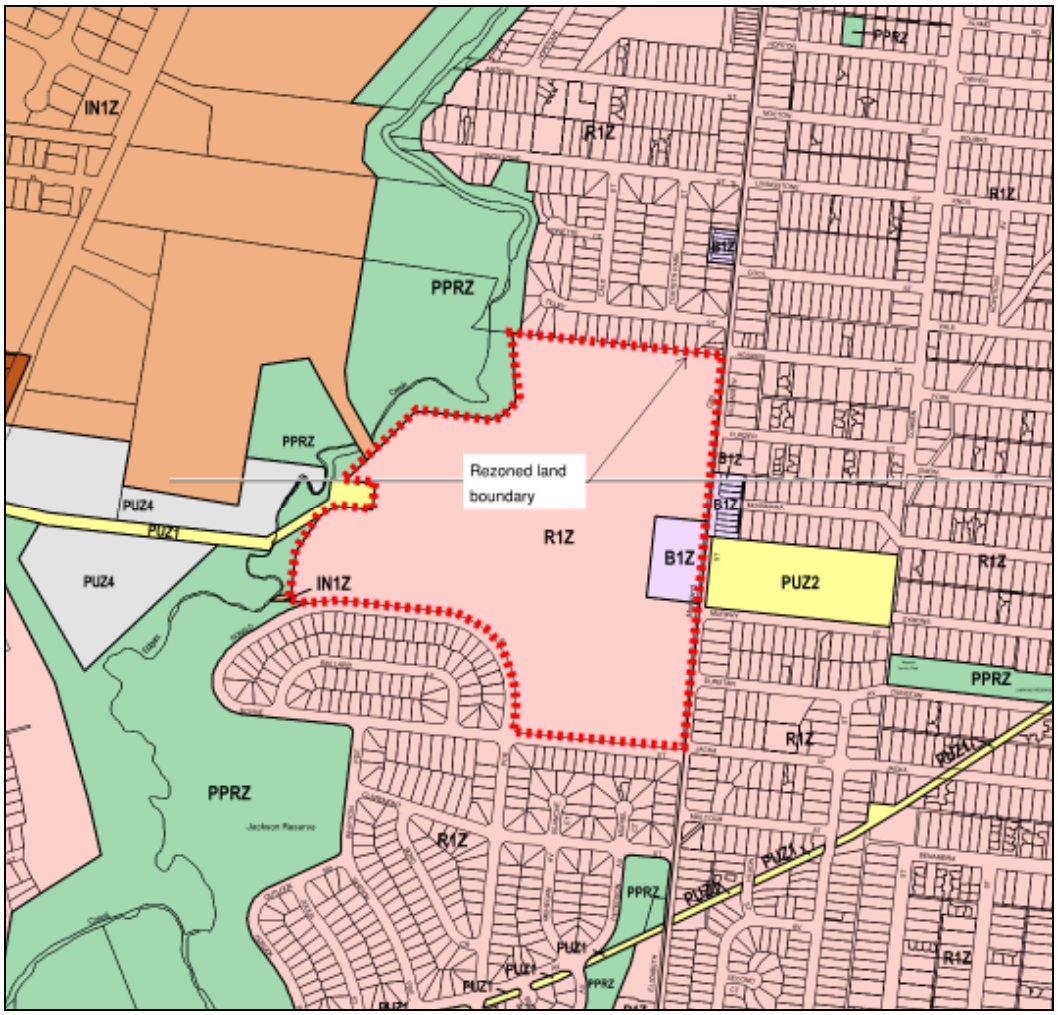

Figure 3: Zoning diagram

The zoning level and noise limits applicable to the subject site are presented in Table 4.

Table 4
Subject site noise limits

Period	Zoning level	Background noise level	Noise limit
Day	50dBA	43dBA	50dBA
Evening	44dBA	41dBA	44dBA
Night	39dBA	38dBA	41dBA

The existing industry in the vicinity of the subject site must comply with the limits presented in Table 4.

6.2 Internal noise levels – AS2107

In order to meet the requirements of Clause 22.03 of the Moreland Planning Scheme, internal noise levels inside residential properties should meet the levels presented in Table 5.

Table 5
Recommended indoor sound levels from AS2107, L_{eq}

Type of space	Recommended noise level for houses and apartments near minor roads
Sleeping areas	30-35dBA
Living areas	30-40dBA
Common areas (foyer, lift lobby, etc)	45-55dBA

7.0 NOISE ASSESSMENT

7.1 SEPP N-1

The noise measurement results in Section 5.2 indicate that emissions from the concrete batching plant and the waste transfer station currently exceed the SEPP N-1 noise limits (refer Table 4) at the subject site and at existing residential areas to the north and south of the subject site.

At locations within the subject site, noise emissions exceed the SEPP N-1 noise limits by up to 8dB. At residential areas to the north of the subject site, noise emissions exceed the SEPP N-1 noise limits by up to 10dB. At residential areas to the south of the subject site, noise emissions exceed the SEPP N-1 noise limits by up to 8dB.

The onus, by law, is on the existing industry to ensure that compliance with the SEPP N-1 noise limits is achieved.

7.2 AS2107

The proposed residential development at the subject site can be designed to ensure that the recommendations of AS2107 are achieved, even if industry does not comply with the SEPP N-1 noise limits.

Preliminary calculations indicate that if typical building envelope constructions were incorporated, the requirements of AS2107 could be achieved.

Table 6 presents the details of typical building envelope constructions. The constructions shown are examples only. Alternative construction options with equivalent sound insulation properties will also be suitable.

Table 6
Examples of typical building envelope constructions

Building element	Construction
Brick veneer walls	110mm brick 40mm cavity with brick ties Sisalation 90mm stud with R1.5 batts 10mm plasterboard (650kg/m^3)
Light weight clad walls	6mm thick compressed fibre cement sheet (2100kg/m^3) 35mm batten Sisilation 90mm stud with R1.5 batts 10mm Fyrcheck plasterboard (800kg/m^3)
Terracotta tile roof	Terracotta tile roof with sarking Timber ceiling joists/trusses at 1200mm max centres Rondo furring channel at 600mm max centres fixed to truss bottom cord with fixing clips 10mm Gyprock Fyrcheck Bradford R2.0 glasswool batts or similar in ceiling cavity (Similar to CSR875 system)
Metal deck roof	Colourbond roofing (minimum thickness 0.77mm) Rondo furring channel at 600mm max centres fixed to truss bottom cord with fixing clips 10mm Gyprock Fyrcheck Bradford R2.0 glasswool batts or similar in ceiling cavity (Similar to CSR875 system)
Glazing	6mm float glazing
Doors	Ideally any external doors facing north west should be solid core doors with perimeter and bottom jamb acoustic seals

All external windows and doors should be fitted with airtight acoustic seals. Openable windows should be awning (hinged) windows fitted with compression seals and cam lock closing mechanisms.

With this type of building envelope noise from industry could be reduced to less that 30dBA in all internal areas.

The sound insulation treatments provided are indicative first estimates only and alternatives may be used provided that the required internal noise level is achieved.

8.0 DISCUSSION

Noise emissions from industry adjacent to the former Kodak site, North Coburg, currently exceed the night-time noise limits at the subject site and at existing residential areas to the north and south of the subject site.

It is the responsibility of existing industry to ensure that the SEPP N-1 noise limits are achieved at all existing residential areas.

It has been demonstrated that, even if noise emissions from existing industry exceed the SEPP N-1 noise limits, the use of conventional building envelope materials for proposed dwellings at the subject site will enable the recommendations of AS2107 to be achieved.

APPENDIX A

ACOUSTIC TERMINOLOGY

Ambient	The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source.
dBA	Unit of overall noise level, in A-weighted decibels. The A-weighting approximates the average human response over the entire frequency range.
L_{90}	Background noise levels are described in terms of the level exceeded for 90% of the measurement period (L_{90}). This is commonly referred to as the typical minimum level and is generally measured in dBA.
L_{eff}	The effective level of a sound source in accordance with *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* (SEPP N-1).
L_{eq}	Continuous or semi-continuous noise levels are described in terms of the equivalent continuous sound level (L_{eq}). This is the constant sound level over a stated time period which is equivalent in total sound energy to the time-varying sound level measured over the same time period. This is commonly referred to as the average noise level and is generally measured in dBA.

APPENDIX B

ZONING MAP