HEGGIES
AUSTRALIA

REPORT 10-4912-R2
Revision 1

Concept Plan for the Redevelopment of Lot 11 DP558723, Lot 1 DP200697 and Lot 2 DP262213 Construction, Operating and Traffic Noise Assessment

PREPARED FOR

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Level 3, 7 Bridge Street
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Concept Plan for the Redevelopment of Lot 11 DP558723, Lot 1 DP200697 and Lot 2 DP262213 Construction, Operating and Traffic Noise Assessment

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1 INTRODUCTION

1.1 Assessment Requirements

Hanson Construction Materials (Hanson) has historically conducted quarrying and extractive operations, premix concrete and asphalt production, transport logics and associated storage and handling from its Eastern Creek site. The site is located off Quarry Road within the Eastern Creek Precinct, in the Central Western Sydney Employment Area, approximately 35 km from the Sydney CBD.

Hanson proposes to consolidate its operations to a subdivided section of the site by relocating existing activities, plus the addition of a concrete masonry plant, while ceasing quarrying and extractive uses. Heggies Australia Pty Ltd (Heggies) has been engaged by Planning Workshop Australia (PWA) on behalf of Hanson to assess potential noise impacts associated with the site consolidation (the Project). The assessment has been guided by the NSW Department of Planning (DoP) Environmental Assessment (EA) noise impact requirements as follows:

> ***Strategic Planning*** *- demonstrate that the proposal is generally consistent with the Eastern Creek Precinct Plan (Stage 3), and justify any inconsistencies between the proposal and the precinct plan;*
>
> ***Noise*** *- including construction, operation and traffic noise;*

Hanson seeks Concept Approval for overall Site Consolidation Plan as well as Project Approval for all associated activities except Concrete Masonry Plant and the Materials Storage and Transfer Depot operations. However, at the Project Planning Focus meeting (07 September 2006) the DoP requested all proposed operations be considered for the purposes of noise (and air quality) impact assessment. The DoP and Department of Environment and Conservation (DEC) also confirmed that the right-of-way access to the Project site (Quarry Road) be treated as a 'Collector Road' for the purposes of traffic noise impact assessment. Therefore in accordance with the DoP requirements, the major sources of noise emissions may be grouped as follows:

On-site Construction Intrusive Noise

Construction Noise: The noise impact assessment of on-site construction works remains according to the Department of Environment and Conservations (DEC's) Environmental Noise Control Manual (ENCM 1994) Chapter 171 Noise Control Guideline - Construction Site Noise.

However, as construction activities will be carried out simultaneously with ongoing daytime operations at the site, the initial 6 month daytime construction and operation period has been conservatively assessed in accordance NSW Industrial Noise Policy (INP 2000) where the intrusive level should generally not exceed the background level by more than 5 dBA for residential receivers.

On-site Operating Intrusive Noise

Operating Noise: The NSW Industrial Noise Policy (INP 2000) provides non-mandatory procedures for setting acceptable $L_{Aeq(15minute)}$ intrusive and $L_{Aeq(period)}$ amenity noise levels for various receiver areas and guidelines for assessing noise impacts from on-site stationary noise sources. The noise generating sources potentially operating simultaneously include:

- The proposed Concrete Batching Plant, Concrete Recycling Plant, Asphalt and Emulsion Plant, Logistics Operation and Workshop, Office and Laboratory.
- The planned Concrete Masonry Plant and the Materials Storage and Transfer Depot operations.
- The anticipated on-site heavy vehicle movements associated with each of the foregoing plant operations.

On-site Operating Noise Amenity (Eastern Creek Precinct Plan Stage 3 2005)

Operating Noise: The INP also provides non-mandatory cumulative noise assessment guidelines that address existing and successive industrial development by setting acceptable (and maximum) cumulative $L_{Aeq(period)}$ amenity levels for all industrial (ie non-transport related) noise in various receiver areas. Note, the INP does not set acceptable cumulative $L_{Aeq(15minute)}$ intrusive criteria for all industrial noise sources in a receiver area, but rather seeks to control cumulative noise via its amenity criteria.

A review of the cumulative noise amenity levels from within the Eastern Creek Precinct, guided by the requirements of the INP, is presented in the SEPP 59 – Eastern Creek Precinct Plan (Stage 3) dated 14 December 2005. Section 7.8 Noise and Vibration of the Plan nominates residential receiver $L_{Aeq(period)}$ noise amenity criteria aimed to limit noise emissions arising from Zone 1 and Zone 4 which includes the Hanson Project site.

Off-site Road Traffic Noise

Road Traffic: The NSW Environmental Criteria for Road Traffic Noise (ECRTN 1999) provides non-mandatory procedures for setting acceptable L_{Aeq} noise levels on arterial, collector and local roads and guidelines for assessing noise impacts from off-site road traffic to residential receivers.

While operating within the Project site heavy vehicle movements are included in the on –site intrusive and amenity noise assessments, described above. The proposed Project related traffic movements are consistent established vehicle movements over recent years and the resulting traffic noise levels are assessed in accordance with the ECRTN.

1.2 Existing and Proposed Hours of Operation

The existing and proposed hours of operation are presented in **Table 1**.

Table 1 Existing and Proposed Hours of Construction and Operation

Phase	Existing	Proposed
6 Month Construction Phase	n/a	0700 hours to 1800 hours Monday to Friday 0700 hours to 1300 hours Saturday
Concrete Batching Plant, Concrete Recycling Plant, Asphalt and Emulsion Plant, Logistics Operation and Workshop, Office and Laboratory, Materials Storage and Transfer Depot	24 hours 7 days per week	24 hours 7 Days per week
Concrete Masonry Plant	n/a	24 hours 7 days per week
Quarrying and Extractive Uses[1]	24 hours 7 days per week	n/a
Off site road transport	24 hours 7 days per week	24 hours 7 days per week

Note 1: Drill and blast operations will cease in the "Pioneer Quarry" located just north of the Project Site.

The facility will continue to operate 24 hours a day, seven days a week, 365 days of the year. There is little (or no) evidence of community concern with the existing hours of operation, as Hanson advise that there have been negligible community generated noise enquires over recent years.

2 PROJECT OVERVIEW

2.1 Receiver Areas

The Project Site Receiver Plan attached as **Appendix A** identifies the nearest potentially affected residential and industrial receiver areas beyond the Project site boundary. Selected representative assessment locations for each receiver area are presented in **Table 2**.

Table 2 Nearest Potentially Affected Receiver Areas and Assessment Locations

Receiver Area	ID and Location		INP Noise Zone and Precinct Plan Zone	LEP Zone
Minchinbury (South)	MB1	Cobbler Crescent	Urban and Zone 1	Residential
	MB2	Barossa Drive		
	MB3	Agrafe Place		
Erskine Park (North)[1]	EN1	Warbler Street	Urban and Zone 1	Residential
Erskine Park (South)	ES1	Swamphen Street	Urban and Zone 4	Residential
	ES2	Fantail Crescent		
	ES3	Pollux Close		
Eastern Creek Precinct	EC1	"Pioneer Quarry"	Industrial	Employment Lands including industrial, storage and logistics as well as extractive industries
	EC2	Australand Pty Ltd		
	EC3	Coles Myer Ltd		

Note 1: Erskine Park North – identified as the residential receiver area north of Swamphen Street

As shown on Project Site Receiver Plan (**Appendix A)** the surrounding land uses include:

- The nearest residential areas are the suburbs of Minchinbury to the immediate north of the M4 Motorway, Erskine Park to the west and Horsley Park to the far south west.
- To the north is the "Pioneer Quarry", which has been operating since the 1930's.
- To the east is undeveloped land, also part of the Eastern Creek Precinct Stage 3 Release.
- To the south-east on Part Lots 10, 11 and 14 of DP 1072146 is to be a National Distribution Centre for Coles Myer Ltd, approved by the Minister in June 2005.
- To the west is a corridor of mostly undeveloped land. An electricity transmission line is located on this land, 500 m from the site.

As discussed, a review of the cumulative noise amenity levels from within the Eastern Creek Precinct, guided by the requirements of the INP, is presented in the SEPP 59 - Eastern Creek Precinct Plan (Stage 3) dated 14 December 2005. The detailed acoustical assessment accompanying the Precinct Pan (Heggies Report 30-1268-R1 dated 22 September 2003) describes the existing noise environment as follows:

> *The acoustical environment adjacent to the M4 typifies an urban environment, with heavy and continuous traffic flows, and residences near industrial districts. Therefore, the residences in Minchinbury and the northern-most residences of Erskine Park have been assessed under the "urban" receiver type. Other residential receivers in Erskine Park and Horsley Park have been assessed under the "suburban" receiver type.*

The findings of the existing acoustical environment presented **Section 3.2** of this report supports the previous use of the INPs urban receiver type for Minchinbury and Erskine Park (North) and suburban receiver type for Erskine Park (South). However it is noted that the increasing development and associated transportation surrounding Erskine Park (South) will ultimately give rise to an urban classification. Adjacent receivers within the Precinct Area are industrial by definition with the potentially most sensitive noise receivers being the administration areas.

2.2 On-site Construction

The site requires minimal clearing and earthworks; construction of hardstand; and the delivery and erection of some equipment, offices and laboratories. Supplementary heavy mobile vehicles would include FEL, grading and compaction equipment.

The screening plant, associated bin structures, stockpile stacker conveyors, fuel storage tank and laboratory will be demolished. The primary jaw crusher, conveyor, electrical substation yard and control room and secondary crusher will be relocated. Some excavation will be required for footings, foundations, service trenches and the like.

Construction would be expected to be completed within six months and would be carried out during normal construction hours in accordance with DEC guidelines.

2.3 On-site Operation

The Project Site Layout Plan attached as **Appendix B** identifies the proposed Lot Boundary, Internal Road Alignments and Major Operating Areas. The proposed use, fixed plant, mobile equipment and associated peak hourly heavy vehicle movements are summarised in **Table 3**.

Table 3 Proposed Use, Fixed Plant and Mobile Equipment and Vehicle Movements

Proposed Use	Fixed Plant	Heavy Mobile Equipment	Peak Hourly Heavy Vehicles Movements
Minor road realignment and internal roads	n/a	During construction FELs graders, compactors	n/a
Concrete Batching Plant	Fixed Plant - 3,000 m^2 Workshop - 200 m^2 Office - 180 m^2	Front-end Loader CAT 924	Daytime: 20 trucks Evening: 5 trucks Night: 8 trucks
Concrete Recycling Plant	3,000 m^2	Front-end Loader CAT 988 Haul Truck CAT 773E	Daytime: 3 trucks Evening: 1 truck Night: 1 truck
Asphalt Plant, Emulsion Plant, Spray Seal Depot	Asphalt Plant - 7,000 m^2 Emulsion Plant - 2,000 m^2 Workshop - 700 m^2 Office and Laboratory - 300 m^2	Front-end Loader CAT 980	Daytime: 40 trucks Evening: 10 trucks Night: 16 trucks
Materials Storage and Transfer Depot	6,000 m^2	2 off Front-end Loaders CAT 980	Daytime: 25 trucks Evening: 7 trucks Night: 10 trucks
Concrete Masonry Plant	3,200 m^2	Front-end Loader CAT 914 2 off Forklifts	Daytime: 12 trucks Evening: 3 trucks Night: 5 trucks
Office and Laboratory	2,000 m^2	n/a	n/a
Logistics Operation and Workshop	1,400 m^2	n/a	n/a

2.4 Off-site Road Traffic

The peak hourly heavy vehicle movements along Quarry Road are shown in **Table 3**. Details of light vehicle movements and the associated Quarry Road traffic noise levels are presented in **Section 7**.

3 EXISTING METEOROLOGICAL AND NOISE ENVIRONMENT

3.1 Meteorological Environment

The NSW INP (2000) Section 5.3, Wind Effects, states:

> *"Wind effects need to be assessed where wind is a feature of the area. Wind is considered to be a feature where source to receiver wind speeds (at 10 m height) of 3 m/s or below occur for 30 percent of the time or more in any assessment period in any season."*

An assessment of prevailing wind conditions was derived from the meteorological data recorded adjacent to the Bureau of Meteorology's (BoMs) Horsley Park Weather Station. The dominant seasonal wind speeds and directions for the 2-year period September 2003 to September 2006 are presented in **Appendix C** for daytime (0700 hours to 1800 hours), evening (1800 hours to 2200 hours) and night-time (2200 hours to 0700 hours).

The prevailing winds less than (or equal to) 3 m/s with a frequency of occurrence greater than (or equal to) 30% and considered to be relevant to the site in accordance with the INP are presented in **Table 4**. While night-time westerly winds occur regularly Winter and Autumn the frequency of the occurrence does not exceed 30% and hence prevailing winds are not considered as a feature of the area. This is consistent with the meteorological data presented in the Precinct Plan.

Table 4 Prevailing Wind Conditions in accordance with the INP

Season	Winds ± 45° ≤3 m/s with Frequency of Occurrence ≥30%		
	Daytime	**Evening**	**Night-time**
Anytime	Nil	Nil	Nil

The INP Section 5.2, Temperature Inversions, states:

> *"Assessment of impacts is confined to the night noise assessment period (10.00 pm to 7.00 am), as this is the time likely to have the greatest impact - that is, when temperature inversions usually occur and disturbance to sleep is possible."*
>
> *"Where inversion conditions are predicted for at least 30% (or approximately two nights per week) of total night-time in winter, then inversion effects are considered to be significant and should be taken into account in the noise assessment".*

An assessment of atmospheric stability conditions has also been prepared from the meteorological data set described above. The winter daytime as well as evening/night-time frequency of occurrence of atmospheric stability classes are presented in **Table 5**.

Table 5 Atmospheric Stability Frequency - Winter Daytime and Evening/Night-time

Stability Class	Frequency of Occurrence		Estimated ELR[1] °C/100 m	Qualitative Description
	Daytime	**Evening/Night-time**		
A	0%	0%	<-1.9	Lapse
B	10%	0%	-1.9 to -1.7	Lapse
C	22%	0%	-1.7 to -1.5	Lapse
D	64%	13%	-1.5 to -0.5	Neutral
E	2%	27%	-0.5 to 1.5	Weak Inversion
F and greater	2%	60%	1.5 to 4 and >4.0	Moderate to Strong Inversion

Note 1: Estimated ELR (Environmental Lapse Rate).

In accordance with the INP the frequency of occurrence of moderate to strong (ie 1.5 to >4.0°C/100 m) winter temperature inversions is greater than 30% during the combined evening and night-time period and therefore requires assessment. Again, this is consistent with the meteorological data presented in the Precinct Plan, where a temperature inversion 3°C/100 m was assumed as appropriate.

Noise Model Meteorological Parameters

Based on the above analysis, the noise modelling meteorology parameters are summarised in **Table 6**.

Table 6 Calm (neutral) and Noise Enhancing Meteorological Modelling Parameters

Period	Meteorological Parameter	Air Temp	Relative Humidity	Wind Velocity	Temperature Gradient
Daytime	Calm	20°C	70%	0 m/s	0°C/100 m
Evening	Calm	15°C	80%	0 m/s	0°C/100 m
Night-time	Calm	10°C	90%	0 m/s	0°C/100 m
	Inversion only	10°C	90%	0 m/s	3°C/100 m
	Inversion plus Drainage flow	10°C	90%	W 2 m/s	3°C/100 m

3.2 Noise Environment

A noise monitoring programme was conducted in September 2006 to quantify background noise levels (ie all noise sources) and to estimate industrial noise only (ie in the absence of transport, natural and domestic noise) at two representative residential receiver areas. The locations were chosen to be representative of the residential areas to Minchinbury (South) and Esrkine Park (South) as well as for general consistency with the previous Precinct Plan noise studies in 2003.

In order to supplement the unattended logger measurements and to assist in identifying the character and duration of the noise sources, operator-attended daytime surveys were also conducted at the two logging locations. The measurement methodology and analysis procedures are described in **Appendix D**.

The unattended ambient noise logger data from each monitoring location and the on-site weather conditions were analysed on a daily basis and presented graphically as statistical 24 hour background noise profiles in **Appendix E**. The background noise data were then processed in accordance with the requirements of the INP to derive the Rating Background Levels (RBLs) presented in **Table 7** together with the previous results from the Precinct Plan studies in 2003.

Table 7 Unattended Noise Logger Results 2006 and 2003 (dBA re 20 µPa)

Receiver Area	ID	Measured RBL All Noise Sources			Measured $L_{Aeq(period)}$[1] All Noise Sources			Estimated $L_{Aeq(period)}$[1] Industrial Noise Only		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Minchinbury (South)-2006	MB2	47	45	42	54	53	53	<54	<44	<39
Minchinbury (South)-2003	MB2	47	48	41	59	54	52	<54	<44	<39
Erskine Park (South)-2006	ES2	43	50	44	61	54	52	<49	<39	<34
Erskine Park (South)-2003	ES2	37	39	33	55	48	46	<49	<39	<34

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours and Night-time 2200 hours to 0700 hours.

Background Noise for Assessment Purposes

The background noise levels at Minchinbury (South) are generally consistent between 2006 and 2003 and are therefore suitable for setting INP-based intrusive and amenity project specific noise levels. By comparison with Minchinbury (South), it's reasonable to assume a similar noise environment would prevail at Erskine Park (North) due similar proximity to the M4 Motorway.

The background noise levels at Erskine Park (South) show a relatively wider range with the 2006 results appreciably higher by comparison with 2003. Since 2003, the area to the south of Erskine Park (South) has been subject to increased development and associated transportation and so a moderate increase in background noise can be reasonably expected. However, the 2006 monitoring period was also subject to enhanced insect activity following the heavy rain in early September and some of the appreciable noise increase is likely to be only temporary particularly during the evening and night-time. Conservatively lower background noise levels than those observed in September have therefore been adopted.

As a result, the 2006/2003 noise levels have been distilled into single representative Rating Background Levels (RBLs) and industrial amenity levels as presented in **Table 8** for each receiver area of interest to the assessment of noise impact from the Project. Note, in all cases the measured background noise levels are unaffected by any existing Hanson operations.

Table 8 Background and Industrial Noise for Assessment (dBA re 20 µPa)

Receiver Area	ID	Estimated RBLs All Noise Sources			Estimated $L_{Aeq(period)}$[1] Industrial Noise Only		
		Day	Evening	Night	Day	Evening	Night
Minchinbury (South)	MB1 to MB3	47	45	42	<54	<44	<39
Erskine Park (North)	EN1	47	45	42	<54	<44	<39
Erskine Park (South)	ES1 to ES3	42	42	37	<49	<39	<34
Eastern Creek Precinct	EC1 to EC3	n/a			<64	<64	<64

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours and Night-time 2200 hours to 0700 hours

4 NOISE ASSESSMENT METHODOLOGY

4.1 Construction Assessment Criteria

The assessment of potential noise impacts from on-site construction works remains according to the DEC's Environmental Noise Control Manual (ENCM) (1994) Chapter 171 Noise Control Guideline - Construction Site Noise (**Appendix F**). As the duration of the daytime (only) construction works is 6 months the guideline suggests that the construction noise emissions should generally not exceed the background noise level by more than 10 dBA for residential receivers.

However, as construction activities will be carried out simultaneously with ongoing daytime operations at the site, the initial 6 month daytime construction and operation period has been conservatively assessed in accordance with INP where the noise emissions should generally not exceed the background noise level by more than 5 dBA for residential receivers.

4.2 Operating Assessment Criteria

Sleep Disturbance

The DEC's "*Sleep Disturbance Noise Criteria Guideline*" dated 22 June 2004 recognises that the current $L_{A1(60sec)}$ sleep disturbance criteria of 15 dBA above the prevailing $L_{A90(15min)}$ level is not ideal. The assessment of potential sleep disturbance is complex and poorly understood and the DEC believes that there is insufficient information to determine a suitable alternative criteria.

In the interim, the DEC suggest that the $L_{A1(60sec)}$ level 15 dBA above the Rating Background Level (RBL) is a suitable screening criteria for sleep disturbance for the night-time period. In practice, sleep disturbance is assessed as the emergence of the $L_{A1(60sec)}$ level above the $L_{A90(15min)}$ prevailing at the time.

During the course of on-site noise measurements to determine plant and equipment sound power levels (SWLs) there was little (or no) emergence of on-site maximum noise levels (particularly from truck movements) that was deemed likely to cause sleep disturbance at residential receivers located more than 1000m to the north (Minchinbury) and 1500m to west (Erskine Park). Hanson also advise that there have been negligible community generated noise enquires over recent years.

Therefore, it is considered that the INP-based criteria would be the controlling factor in determining compliance, as opposed to the sleep disturbance criteria. This relationship enables the noise assessment process to focus on the setting of the appropriate INP-based criteria which aim to minimise annoyance at any noise sensitive receiver location.

Operation

The NSW DEC has regulatory responsibility for the control of noise from "scheduled premises" under the Protection of the Environment Operations Act 1997. In implementing the INP the DEC has two broad objectives:

- Controlling intrusive noise impacts in the short term.
- Maintaining noise level amenity for particular landuses over the medium to long term.

The INP prescribes detailed calculation routines for establishing "project specific" $L_{Aeq(15minute)}$ intrusive criteria and $L_{Aeq(period)}$ amenity (ie non-transport related) criteria for a development at potentially affected receivers. Ideally, the intrusive noise emission should generally not exceed the background level by more than 5 dBA.

Similarly, the amenity level should generally not exceed the specified INP acceptable or Eastern Creek Precinct Plan noise levels appropriate for the particular locality and land use as shown in **Table 9**.

Table 9 INP Acceptable and Precinct Noise Amenity Levels (dBA re 20 µPa)

Receiver Area	INP Noise Zone and Precinct Plan Zone	Amenity $L_{Aeq(period)}$[2] INP Acceptable			Amenity $L_{Aeq(period)}$[2] Eastern Creek Precinct Plan		
		Day	Evening	Night	Day	Evening	Night
Minchinbury (South)	Urban and Zone 1	60	50	45	57	47	42
Erskine Park (North)	Urban and Zone 1	60	50	45	57	47	42
Erskine Park (South)	Suburban and Zone 4	55	45	40	54	44	39
Eastern Creek Precinct	Industrial	70	70	70	-	-	-
Any	School[1]	External 45 when in use			-		
Any	Hospital	External 50 when in use			-		

Note 1: External criteria equivalent to internal criteria plus 10 dBA.

Note 2: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

In accordance with the INP's Chapter 2 Industrial Noise Criteria in conjunction with the INP's Application Notes (July 2006), the "project specific" intrusive and amenity assessment criteria for the residential and industrial receiver areas are presented in **Table 10**. These criteria are nominated for the purposes of assessing potential noise impacts from the Project.

Table 10 Project Specific Noise Assessment Criteria (dBA re 20 µPa)

Receiver Area	Land Use	INP Intrusive $L_{Aeq(15minute)}$			Precinct Amenity $L_{Aeq(period)}$[1]		
		Day	Evening	Night	Day	Evening	Night
Minchinbury (South)	Urban Residential	52	50	45	57	47	42
Erskine Park (North)	Urban Residential	52	50	45	57	47	42
Erskine Park (South)	Suburban Residential	47	47	42	54	44	39
Eastern Creek Precinct	Industrial	Intrusive noise not applicable			70	70	70
Any	School	Intrusive noise not applicable			External 45 when in use		
Any	Hospital	Intrusive noise not applicable			External 50 when in use		

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

By reducing the night-time intrusive the criteria at Minchinbury (South) and Erskine Park (North) to the background level plus 3 dBA (ie 45 dBA) then the INP's intrusive criteria are the controlling noise levels and compliance with intrusive criteria will also ensure that the Precinct Plan amenity criteria are also achieved.

The INP states that these criteria have been selected to preserve the amenity of at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided the criteria in the INP are achieved, then most people would consider the resultant noise levels acceptable.

In those cases where the INP project specific assessment criteria are not achieved, it does not automatically follow that all people exposed to the noise would find the noise unacceptable. In subjective terms, exceedances of the INP project specific assessment criteria can be generally described as follows:

- Negligible noise level increase <1 dBA
  (Not noticeable by all people)
- Marginal noise level increase 1 dBA to 2 dBA
  (Not noticeable by most people)
- Moderate noise level increase 3 dBA to 5 dBA
  (Not noticeable by some people but may be noticeable by others)
- Appreciable noise level increase >5 dBA
  (Noticeable by most people)

4.3 Noise Modelling

The Project computer model was developed to incorporate the significant noise sources associated with the proposed development. Additionally, surrounding terrain, aspects of the built environment and nearby receiver areas were also included in the model. The model was prepared using the SoundPlan 6, a commercial software system. The following scenarios were assessed:

Construction Noise: The noise generating sources potentially operating simultaneously include:

- Supplementary heavy mobile vehicles including FEL, grading and compaction equipment.
- The proposed Concrete Batching Plant, Concrete Recycling Plant, Asphalt and Emulsion Plant, Logistics Operation and Workshop, Office and Laboratory.
- The anticipated on-site heavy vehicle movements associated with each of the foregoing plant operations.

Operating Noise: The noise generating sources potentially operating simultaneously include:

- The proposed Concrete Batching Plant, Concrete Recycling Plant, Asphalt and Emulsion Plant, Logistics Operation and Workshop, Office and Laboratory.
- The planned Concrete Masonry Plant and the Materials Storage and Transfer Depot operations.
- The anticipated on-site heavy vehicle movements associated with each of the foregoing plant operations.

The noise modelling includes all significant items of plant and equipment working concurrently to simulate and predict the intrusive $L_{Aeq(15minute)}$ and amenity $L_{Aeq(period)}$ levels.

4.4 Noise Mitigation and Control Measures

Construction Noise Management Controls

Construction activities (refer to **Section 2.2**) will be confined to daytime hours in accordance with **Table 1** and are scheduled to be completed within a 6 month period.

Operating Noise Source and Propagation Path Controls

The indicative individual equipment operating L_{Aeq} sound power levels (SWLs) are presented in **Table 11** for all acoustically-relevant items of plant and equipment. Subsequent detailed design studies may be required to refine individual SWLs and to prepare specifications to ensure that the approved off-site environmental noise limits are achieved.

Table 11 Equipment Operating L_{Aeq} Sound Power Levels (dBA re 10 pW)

Equipment	Mitigation or Capacity (or equivalent)	Overall L_{Aeq} SWL
Concrete Recycling		
Primary Crusher	Existing against embankment	109 dBA
Secondary Crusher	Existing	111 dBA
Screen	New and enclosed	108 dBA
Dump Truck	Existing CAT 773	113 dBA
FEL	Existing CAT 988	114 dBA
Asphalt Plant		
Main Plant	Existing	114 dBA
Main Plant Stack	Existing	106 dBA
Asphalt Screen	Existing	111 dBA
Concrete Batch		
Concrete Truck Mixing	Existing	117 dBA
Concrete Truck Mixing in building	New and enclosed	115 dBA
Concrete Products		
Block Manufacture	New purpose building	83 dBA
Fork Lift	Existing	102 dBA
Material Products		
FEL	Existing Komatsu	114 dBA
Workshop		
Workshop Building	New purpose building	73 dBA
Crane	Existing	110 dBA
General		
Delivery Trucks	Existing	109 dBA
Front-end Loaders	Existing	112 dBA

The L_{Aeq} sound power levels presented in **Table 11** do not include noise emissions which emanate from alarms. Alarms will be subject to procurement specifications detailing the tone frequency, noise emission levels, directionality and coverage. They will be installed to optimise safety and to minimise off-site noise leakage. In the unlikely event that alarm noise remains a source of disturbance, then further on-site optimisation and fine adjustments will be implemented to achieve further noise reductions without compromising safety standards.

Receiver Noise Controls

In the event of an exceedance of project specific criteria during construction or operations additional noise mitigation and management measures may include:

- Targeted noise monitoring on-site and within the community.
- Prompt response to any community issues of concern.
- Refinement of on-site noise operating procedures where practicable.

5 CONSTRUCTION NOISE ASSESSMENT

5.1 Daytime Construction and Operation

The predicted $L_{Aeq(15minute)}$ intrusive noise emissions from the simultaneous daytime construction and operation to the nearest residential receiver areas are presented in **Table 12**.

Table 12 Daytime Construction and Operation Intrusive Noise (dBA re 20 μPa)

Receiver Area	ID/Location		Daytime Calm[1]	Daytime Criteria
Minchinbury (South)	MB1	Cobbler Crescent	39	52
	MB2	Barossa Drive	38	
	MB3	Agrafe Place	41	
Erskine Park (North)	EN1	Warbler Street	33	52
Erskine Park (South)	ES1	Swamphen Street	34	47
	ES2	Fantail Crescent	35	
	ES3	Pollux Close	35	

Note 1: Daytime meteorological parameters as described in **Table 6**.

All predicted intrusive noise levels are below the relevant daytime construction criteria and any noise impacts are considered acceptable.

6 OPERATING NOISE ASSESSMENT

6.1 Daytime and Evening Operation

The predicted $L_{Aeq(15minute)}$ intrusive noise emissions from the daytime and evening operation to the nearest residential receiver areas are presented in **Table 13**.

Table 13 Daytime and Evening Operation Intrusive Noise (dBA re 20 μPa)

Receiver Area	ID/Location		Daytime Calm[1]	Daytime Criteria	Evening Calm[1]	Evening Criteria
Minchinbury (South)	MB1	Cobbler Crescent	38	52	38	50
	MB2	Barossa Drive	38		38	
	MB3	Agrafe Place	39		40	
Erskine Park (North)	EN1	Warbler Street	32	52	32	50
Erskine Park (South)	ES1	Swamphen Street	33	47	33	47
	ES2	Fantail Crescent	33		34	
	ES3	Pollux Close	33		34	

Note 1: Daytime and Evening meteorological parameters as described in **Table 6**.

All predicted intrusive noise levels are below the relevant daytime and evening assessment criteria and any noise impacts are considered acceptable. Compliance with intrusive criteria ensures that the Precinct Amenity criteria are achieved.

The daytime $L_{Aeq(15minute)}$ intrusive noise contours under calm conditions is presented as **Appendix G1**. The calculation of the noise contours involves numerical interpolation of a noise level array with a graphical accuracy of up to approximately ±2.0 dBA. This means that in some cases the contour locations presented in **Appendix G1** will differ slightly from the values in **Table 13**, particularly where topographic effects are prominent.

The daytime 70 dBA (blue) noise contour is generally contained within the Project site boundary and any noise impacts to adjacent industrial receivers are also acceptable.

6.2 Night-time Operation

The predicted $L_{Aeq(15minute)}$ intrusive noise emissions from the night-time operation to the nearest residential receiver areas are presented in **Table 14**.

Table 14 Night-time Operation Intrusive Noise (dBA re 20 μPa)

Receiver Area	ID/Location		Calm[1]	Inversion[1]	Inversion & Drainage[1]	Night-time Criteria
Minchinbury (South)	MB1	Cobbler Crescent	38	43	40	45
	MB2	Barossa Drive	39	43	43	
	MB3	Agrafe Place	40	45	45	
Erskine Park (North)	EN1	Warbler Street	33	37	31	45
Erskine Park (South)	ES1	Swamphen Street	34	38	32	42
	ES2	Fantail Crescent	34	39	32	
	ES3	Pollux Close	34	39	33	

Note 1: Night-time meteorological parameters as described in **Table 6**.

All predicted intrusive noise levels are below or meet the relevant night-time assessment criteria and any noise impacts are considered acceptable. Compliance with intrusive criteria ensures that the Precinct Amenity criteria are is also achieved.

The night-time $L_{Aeq(15minute)}$ intrusive noise contours under inversion conditions are presented as **Appendix G2**. The calculation of the noise contours involves numerical interpolation of a noise level array with a graphical accuracy of up to approximately ±2.0 dBA. This means that in some cases the contour locations presented in **Appendix G2** will differ slightly from the values in **Table 14**, particularly where topographic effects are prominent.

The daytime 70 dBA (blue) noise contour is generally contained within the Project site boundary and any noise impacts to adjacent industrial receivers are also acceptable.

7 OFF-SITE TRANSPORT

7.1 Road Transport

Road Traffic Noise Criteria

As discussed in **Section 1.1**, the DoP and the DEC confirmed that the right-of-way access to the Project site (Quarry Road) be treated as a 'Collector Road' for the purposes of traffic noise impact assessment. Based on the EPA's "*Environmental Criteria for Road Traffic Noise*" policy (ECRTN) dated May 1999 the noise criteria are presented in **Table 15** for residential receivers.

Table 15 NSW Environmental Criteria for Road Traffic Noise

Receiver Area	Road	Policy	Descriptor	Noise Criteria
Residential	Quarry Road	Land use developments with the potential to create additional traffic on existing collector road	Daytime $L_{Aeq(1hour)}$	60 dBA
			Night-time $L_{Aeq(1hour)}$	55 dBA

Note that in all cases where the nominated criteria are already exceeded, traffic associated with the development should not be permitted to lead to an increase in the existing noise traffic levels of more than 2 dBA.

Road Traffic Movements

The anticipate peak hourly daytime and night-time Project related vehicle movements along Quarry Road are presented in **Table 16** together with the calculated off-set distance to achieve the residential traffic noise criteria.

Table 16 Quarry Road Peak Hour Project Related Vehicle Movements

Period	Light Vehicle Peak Hour	Heavy Vehicle Peak Hour	Off-set Distance to Achieve Noise Criteria
Daytime (0700hrs to 2200hrs)	30 movements	100 movements	50 m
Night-time (2200hrs to 0700hrs)	7 movements	40 movements	60 m

Road Traffic Noise Impact

ECRTN's traffic noise assessment criteria applicable to collector roads and residential receivers is daytime $L_{Aeq(1hour)}$ 60 dBA and is calculated to be achieved at an off-set distance of 50m from Quarry road. Similarly, the night-time $L_{Aeq(1hour)}$ 55 dBA is calculated to be achieved at an off-set distance of 60m.

The Project related traffic movements are consistent established vehicle movements over recent years; hence traffic noise levels remain generally unchanged with minimal noise impact. As there are no residential receivers adjacent to Quarry Road it is reasonable to assume traffic noise amenity levels at that current and future industrial receivers will be acceptable.

8 SUMMARY OF FINDINGS

8.1 Construction Noise Assessment

As construction activities will be carried out simultaneously with ongoing daytime operations at the site, the initial 6 month daytime construction and operation period has been conservatively assessed in accordance with INP where the noise emissions should generally not exceed the background noise level by more than 5 dBA for residential receivers.

The site requires minimal earthworks, extension of hardstand areas and the delivery and erection of some fixed plant and equipment, offices and laboratories. The incremental relocation and installation works being carried out by small teams to suit plant and equipment access.

The predicted $L_{Aeq(15minute)}$ intrusive noise emissions from the simultaneous daytime construction and operation to the nearest residential receiver areas shows that intrusive noise levels are below the relevant daytime construction criteria and any noise impacts are considered acceptable.

8.2 Operating INP Intrusive and Precinct Amenity Noise Criteria

The INP prescribes detailed calculation routines for establishing "project specific" $L_{Aeq(15minute)}$ intrusive criteria and $L_{Aeq(period)}$ amenity (ie non-transport related) criteria for a development at potentially affected receivers. Ideally, the intrusive noise emission should generally not exceed the background level by more than 5 dBA.

Similarly, the amenity level should generally not exceed the specified INP acceptable or Eastern Creek Precinct Plan noise levels appropriate for the particular locality and land use as shown in **Table 17**.

Table 17 INP Acceptable and Precinct Noise Amenity Levels (dBA re 20 µPa)

Receiver Area	INP Noise Zone and Precinct Plan Zone	Amenity $L_{Aeq(period)}$[2] INP Acceptable			Amenity $L_{Aeq(period)}$[2] Eastern Creek Precinct Plan		
		Day	Evening	Night	Day	Evening	Night
Minchinbury	Urban and Zone 1	60	50	45	57	47	42
Erskine Park North	Urban and Zone 1	60	50	45	57	47	42
Erskine Park South	Suburban and Zone 4	55	45	40	54	44	39
Eastern Creek Precinct	Industrial	70	70	70	-	-	-
Any	School[1]	External 45 when in use			-		
Any	Hospital	External 50 when in use			-		

Note 1: External criteria equivalent to internal criteria plus 10 dBA.

Note 2: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

In accordance with the INP's Chapter 2 Industrial Noise Criteria in conjunction with the INP's Application Notes (July 2006), the "project specific" intrusive and amenity assessment criteria for the residential and industrial receiver areas are presented in **Table 18**. These criteria are nominated for the purposes of assessing potential noise impacts from the Project.

Table 18 Project Specific Noise Assessment Criteria (dBA re 20 µPa)

Receiver Area	Land Use	INP Intrusive $L_{Aeq(15minute)}$			Precinct Amenity $L_{Aeq(period)}$[1]		
		Day	Evening	Night	Day	Evening	Night
Minchinbury	Urban Residential	50	50	45	57	47	42
Erskine Park North	Urban Residential	50	50	45	57	47	42
Erskine Park South	Suburban Residential	47	47	42	54	44	39
Eastern Creek Precinct	Industrial	Intrusive noise not applicable			70	70	70
Any	School	Intrusive noise not applicable			External 45 when in use		
Any	Hospital	Intrusive noise not applicable			External 50 when in use		

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

The INP's intrusive criteria are the controlling noise levels and compliance with intrusive criteria will also ensure that the Precinct Plan amenity criteria are also achieved.

The INP states that these criteria have been selected to preserve the amenity of at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided the criteria in the INP are achieved, then most people would consider the resultant noise levels acceptable.

In those cases where the INP project specific assessment criteria are not achieved, it does not automatically follow that all people exposed to the noise would find the noise unacceptable. Exceedances of 5 dBA or more are generally required before the "impact" becomes noticeable by most people.

Noise Modelling

The Project computer model was developed to incorporate the significant noise sources associated with the proposed development. Additionally, surrounding terrain and nearby receiver areas were also included in the model. The following scenarios were assessed:

- Daytime Construction and Operation
- Daytime, Evening and Night-time Operation

The noise model includes all significant items of plant and equipment working concurrently to simulate and predict the intrusive $L_{Aeq(15minute)}$ and amenity $L_{Aeq(period)}$ levels.

8.3 Noise Mitigation and Control Measures

Noise mitigation and control measures will be implemented to ensure compliance with project specific criteria presented in **Table 18** as follows:

Construction Noise Management Controls

Construction activities will be confined to daytime hours in accordance with **Table 1** and are scheduled to be completed within a 6 month period.

Operating Noise Source and Propagation Path Controls

The indicative individual equipment operating L_{Aeq} sound power levels (SWLs) are presented in **Table 11** for all acoustically-relevant items of plant and equipment. Subsequent detailed design studies may be required to refine individual SWLs and to prepare specifications to ensure that the approved off-site environmental noise limits are achieved.

The L_{Aeq} sound power levels presented in **Table 11** do not include noise emissions which emanate from alarms. Alarms will be subject to procurement specifications detailing the tone frequency, noise emission levels, directionality and coverage. They will be installed to optimise safety and to minimise off-site noise leakage. In the unlikely event that alarm noise remains a source of disturbance, then further on-site optimisation and fine adjustments will be implemented to achieve further noise reductions without compromising safety standards.

Receiver Noise Controls

In the event of an exceedance of project specific criteria during construction or operations additional noise mitigation and management measures may include:

- Targeted noise monitoring on-site and within the community.
- Prompt response to any community issues of concern.
- Refinement of on-site noise operating procedures where practicable.

8.4 Operating Impact Assessment

Daytime and Evening Operation

All predicted intrusive noise levels are below the relevant daytime and evening assessment criteria and any noise impacts are considered acceptable. Compliance with intrusive criteria ensures that the Precinct Plan amenity criteria are also achieved.

The daytime $L_{Aeq(15minute)}$ intrusive noise contours under calm conditions is presented as **Appendix G1**. The daytime 70 dBA (blue) noise contour is generally contained within the Project site boundary and any noise impacts to adjacent industrial receivers are also acceptable.

Night-time Operation

All predicted intrusive noise levels are below or meet the relevant night-time assessment criteria and any noise impacts are considered acceptable. Compliance with intrusive criteria ensures that the Precinct Plan amenity criteria are also achieved.

The night-time $L_{Aeq(15minute)}$ intrusive noise contours under inversion conditions is presented as **Appendix G2**. The daytime 70 dBA (blue) noise contour is generally contained within the Project site boundary and any noise impacts to adjacent industrial receivers are also acceptable.

8.5 Road Traffic Noise Assessment

ECRTN's traffic noise assessment criteria applicable to collector roads and residential receivers is daytime $L_{Aeq(1hour)}$ 60 dBA and is calculated to be achieved at an off-set distance of 50m from Quarry road. Similarly, the night-time $L_{Aeq(1hour)}$ 55 dBA is calculated to be achieved at an off-set distance of 60m.

The Project related traffic movements are consistent established vehicle movements over recent years; hence traffic noise levels remain generally unchanged with minimal noise impact. As there are no residential receivers adjacent to Quarry Road it is reasonable to assume traffic noise amenity levels at that current and future industrial receivers will be acceptable.

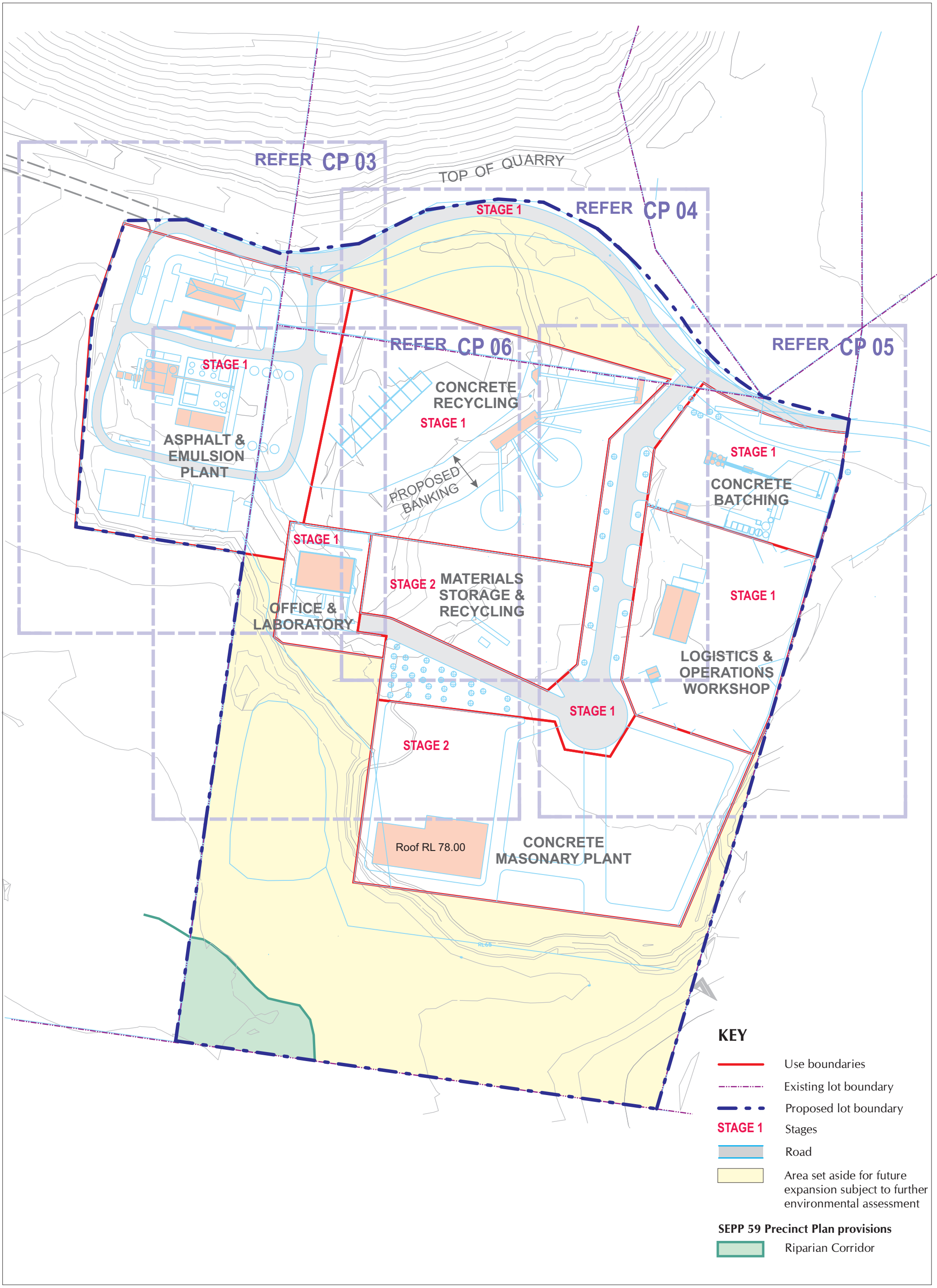
Appendix A

PROJECT SITE PLAN

Project Site Plan

Appendix B

PROJECT LAYOUT PLAN



Central Western Sydney Employment Lands: Wallgrove Rd, Eastern Creek

CONCEPT PLAN - SITE LAYOUT

prepared by urban design workshop
2051067\Graphics\ae_fig_2.cdr

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Issue 5-10-06

CP 02

HORSLEY PARK METEOROLOGICAL DATA SET - SEPTEMBER 2003 TO SEPTEMBER 2005

Table C1 Seasonal Frequency of Occurrence Wind Speed Intervals - Daytime

Period	Calm (<0.5 m/s)	Wind Direction ±(45°)	Wind Speed		
			0.5 to 1.5 m/s	1.5 to 3 m/s	0.5 to 3 m/s
Summer	1.0	N	3	6	9
Autumn	3	NNW	8	8	16
Winter	5	NNW	11	10	20
Spring	1	NNW	4	6	10

Table C2 Seasonal Frequency of Occurrence Wind Speed Intervals - Evening

Period	Calm (<0.5 m/s)	Wind Direction ±(45°)	Wind Speed		
			0.5 to 1.5 m/s	1.5 to 3 m/s	0.5 to 3 m/s
Summer	3	ESE	4	9	13
Autumn	11	SW	6	11	17
Winter	9	W	5	10	16
Spring	6	SSE	4	8	13

Table C3 Seasonal Frequency of Occurrence Wind Speed Intervals - Night-time

Period	Calm (<0.5 m/s)	Wind Direction ±(45°)	Wind Speed		
			0.5 to 1.5 m/s	1.5 to 3 m/s	0.5 to 3 m/s
Summer	18	SSW	11	12	23
Autumn	18	WSW	13	14	28
Winter	13	WNW	15	11	26
Spring	14	SW	8	13	21

Table C4 Consolidated Seasonal Frequency of Occurrence Wind Speed Intervals

Season	Winds ± 45° ≤3 m/s with Frequency of Occurrence ≥30%		
	Daytime	Evening	Night-time
Summer	Nil	Nil	Nil
Autumn	Nil	Nil	Nil
Winter	Nil	Nil	Nil
Spring	Nil	Nil	Nil

Table C5 Frequency of Occurrence of Atmospheric Stability Classes - Winter

Stability Class	Frequency of Occurrence		Estimated ELR °C/100 m	Qualitative Description
	Daytime	Evening & Night-time		
A	0%	0%	<-1.9	Lapse
B	10%	0%	-1.9 to -1.7	Lapse
C	22%	0%	-1.7 to -1.5	Lapse
D	64%	13%	-1.5 to -0.5	Neutral
E	2%	27%	-0.5 to 1.5	Weak Inversion
F and G	2%	60%	1.5 to 4 and >4.0	Moderate to Strong Inversion

Note: ELR (Environmental Lapse Rate).

3.1 Overview of Methodology

A noise monitoring programme was conducted in September 2006 to quantify background noise levels (ie all noise sources) and to estimate industrial noise only (ie in the absence of transport, natural and domestic noise) at two representative residential receiver areas. The locations were chosen to be representative of the residential areas to Minchinbury to the north of the site and to the west in Esrkine Park.

In order to supplement the unattended logger measurements and to assist in identifying the character and duration of the noise sources, operator-attended daytime surveys were also conducted at the two logging locations. The background noise monitoring programme was implemented in accordance with AS 1055-1997 "*Acoustics-Description and Measurement of Environmental Noise*" and the NSW Industrial Noise Policy (INP) 2000.

3.2 Instrumentation and Measurement Parameters

Unattended Monitoring and Operator-Attended Surveys

All acoustic instrumentation employed throughout the noise monitoring programme has been designed to comply with the requirements of AS 1259.2-1990, "Sound Level Meters" and carries current National Association of Testing Authorities (NATA) or manufacturer calibration certificates.

A description of instrumentation, designated type and serial numbers is shown in **Table D1**.

Table D1 Acoustic Instrumentation Schedule

Receiver Area	ID/Location		Logger Position	Instrumentation
Minchinbury (South)	MB2	30 Barossa Drive	Residential dwelling boundary	EL-215 (s/n 194581)
Erskine Park (South)	ES2	51 Fantail Crescent	Residential dwelling boundary	EL-215 (s/n 194625)

All instrumentation was programmed to record continuously the noise exceedance levels in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A50}, L_{A90}, L_{A99}, L_{Amin} and the L_{Aeq}. Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

Weather Monitoring Station

Meteorological data was obtained from the Bureau of Meteorology's (BoMs) Horsley Park Weather Station.

3.3 Unattended Background Noise Monitoring Results

The unattended background noise logger data from each monitoring location, together with the on-site weather conditions were analysed on a daily basis.

The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the interval period. The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. The L_{A10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The L_{Aeq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period.

Prior to further analysis, the background noise data from each location which correlated with periods of unstable weather (eg rainfall greater than 0.5 mm or wind speed greater than 5 m/s) were discarded. The acceptable background noise data was then processed in accordance with the INP "Appendix B - Applying the Background Noise Policy" to derive the Monday to Sunday background noise levels presented in **Table D2**.

Table D2 Unattended Noise Logger Results (dBA re 20 µPa)

Receiver Area	ID	Measured RBL All Noise Sources			Measured $L_{Aeq(period)}$[1] All Noise Sources			Estimated $L_{Aeq(period)}$[1] Industrial Noise Only		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Minchinbury (South)	MB2	47	45	42	54	53	53	<54	<44	<39
Erskine Park (South)	ES2	43	50	44	61	54	52	<49	<39	<34

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours and Night-time 2200 hours to 0700 hours.

3.4 Operator-Attended Background Noise Survey Results

Operator-attended noise surveys of 15 minutes duration were conducted with a precision integrating sound level meter in order to qualify the results obtained with the unattended noise loggers. During the attended noise surveys, the operator identified the character and duration of acoustically significant background noise sources.

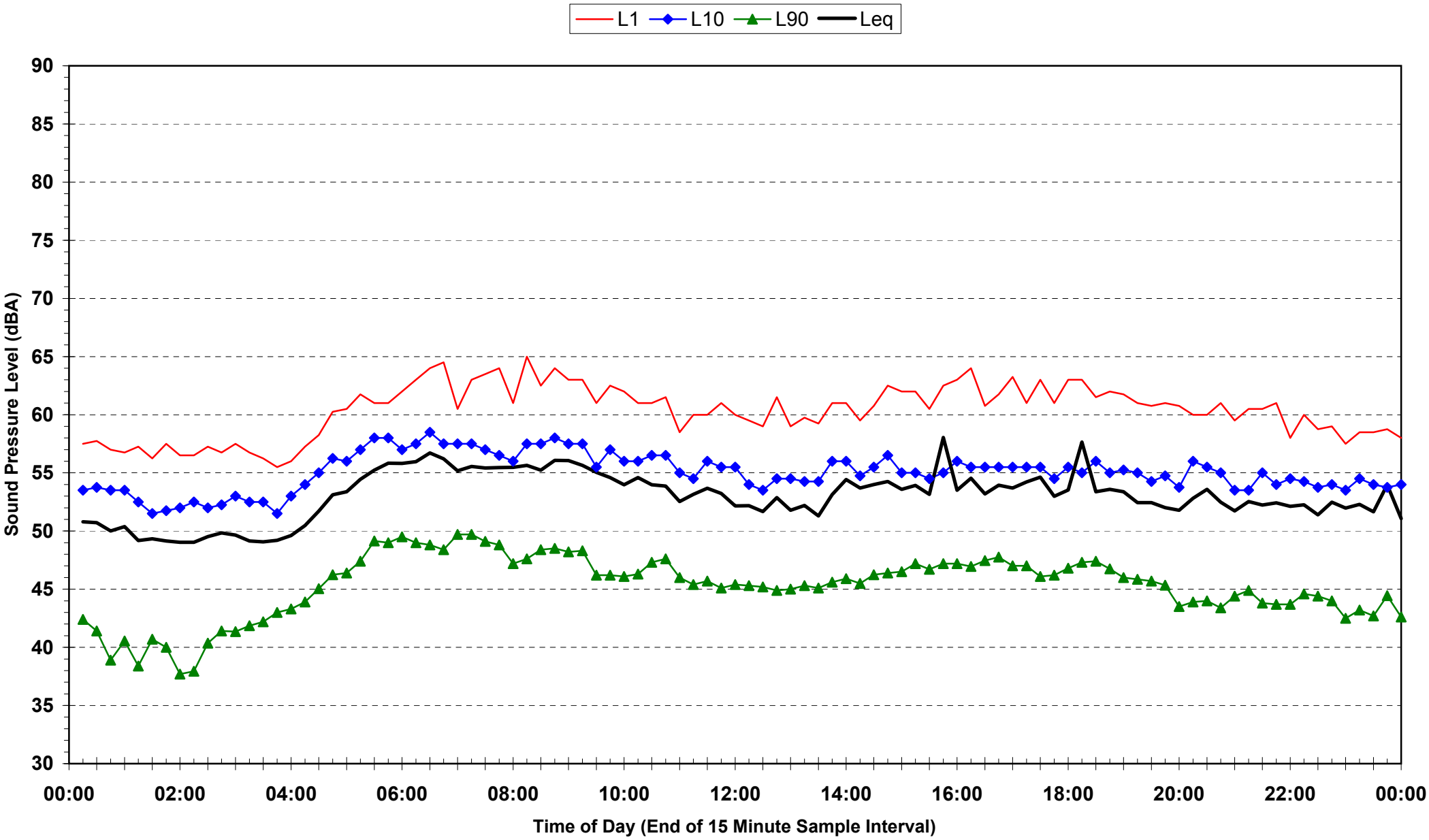
Wherever applicable the operator quantified local traffic flow and made a qualitative assessment of the prevailing weather conditions. The daytime operator-attended noise survey results are presented below:

Table D2 Daytime Operator Attended Results (dBA re 20 µPa)

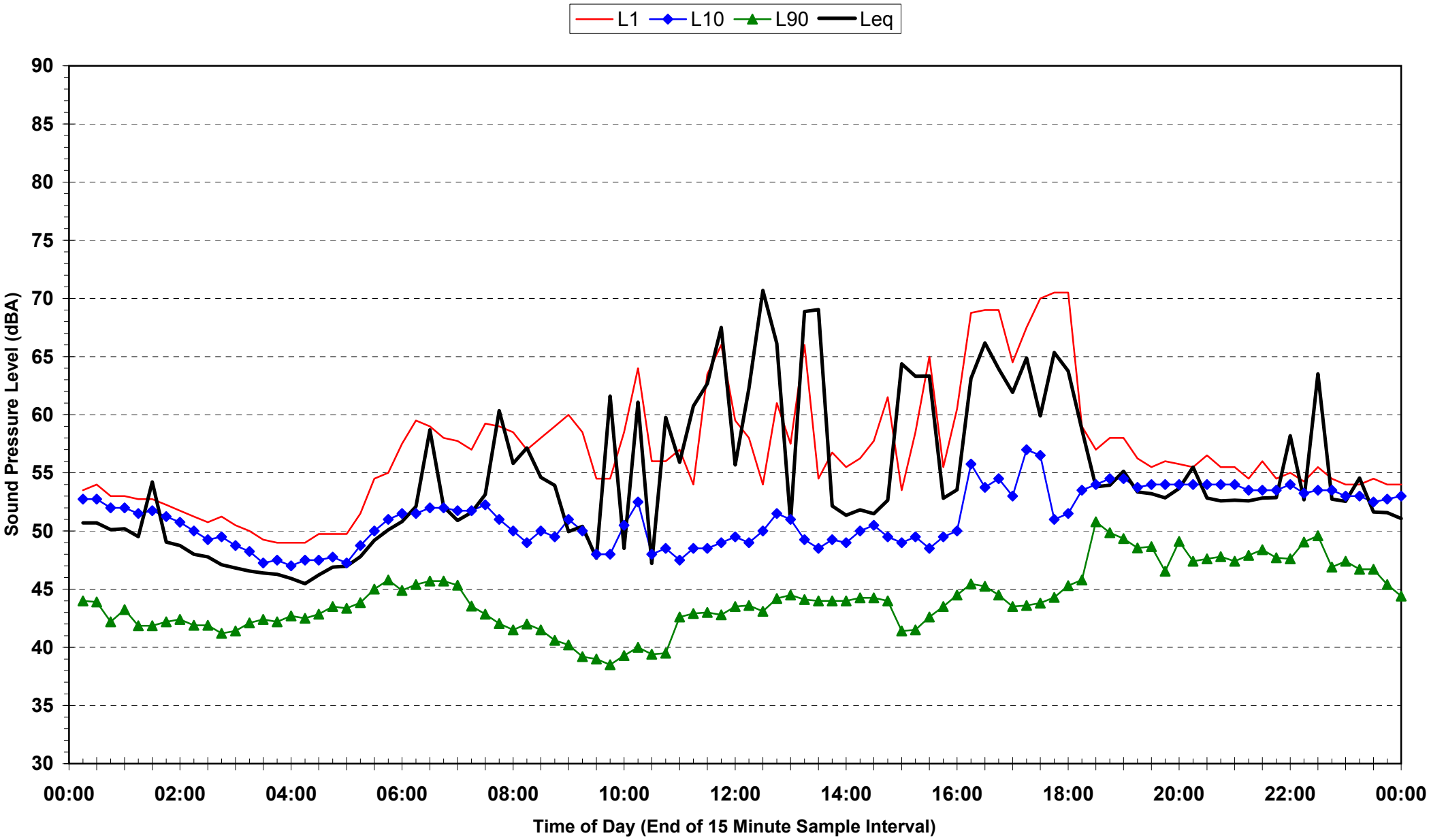
ID and Location	Date/Start Time Weather	Primary Noise Descriptor (dBA re 20uPa)					Typical maximum Levels L_{Amax} - dBA
		Leq	L1	L10	L50	L90	
MB2 - 30 Barossa Drive, Minchinbury (South)	1405 hours, fine and calm	52	59	54	50	46	M4 road traffic, local traffic, birds
		Industrial noise not discernible					
ES2 - 51 Fantail Crescent, Erskine Park (South)	1320 hours, fine and calm	48	54	49	47	45	Distant M4 road traffic, birds and insects
		Industrial noise not discernible					

24-HOUR STATISTICAL NOISE PROFILES

Long-Term Statistical Noise Levels - 30 Barossa Drive Minchinbury (MB2)
Wednesday 13 September 2006 to Friday 22 September 2006



Long-Term Statistical Noise Levels - 51 Fantail Cresent Erskine Park (ES2)
Wednesday 13 September 2006 to Friday 22 September 2006



CHAPTER 171
NOISE CONTROL GUIDELINE CONSTRUCTION SITE NOISE

Where there is likelihood of annoyance due to noise from construction sites, conditions such as the following may be specified in a development consent or building application.

This applies particularly to non-scheduled premises such as commercial buildings where a long construction time is not likely.

The criteria may not be applicable to long-term construction such as coal mines which may take several years.

Variations should be made according to local conditions.

Level Restrictions

i Construction period of 4 weeks and under.

The L_{A10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 20 dBA.

ii Construction period greater than 4 weeks and not exceeding 26 weeks.

The L_{A10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 10 dBA.

Time Restrictions

Monday to Friday 7.00 am to 6.00 pm.

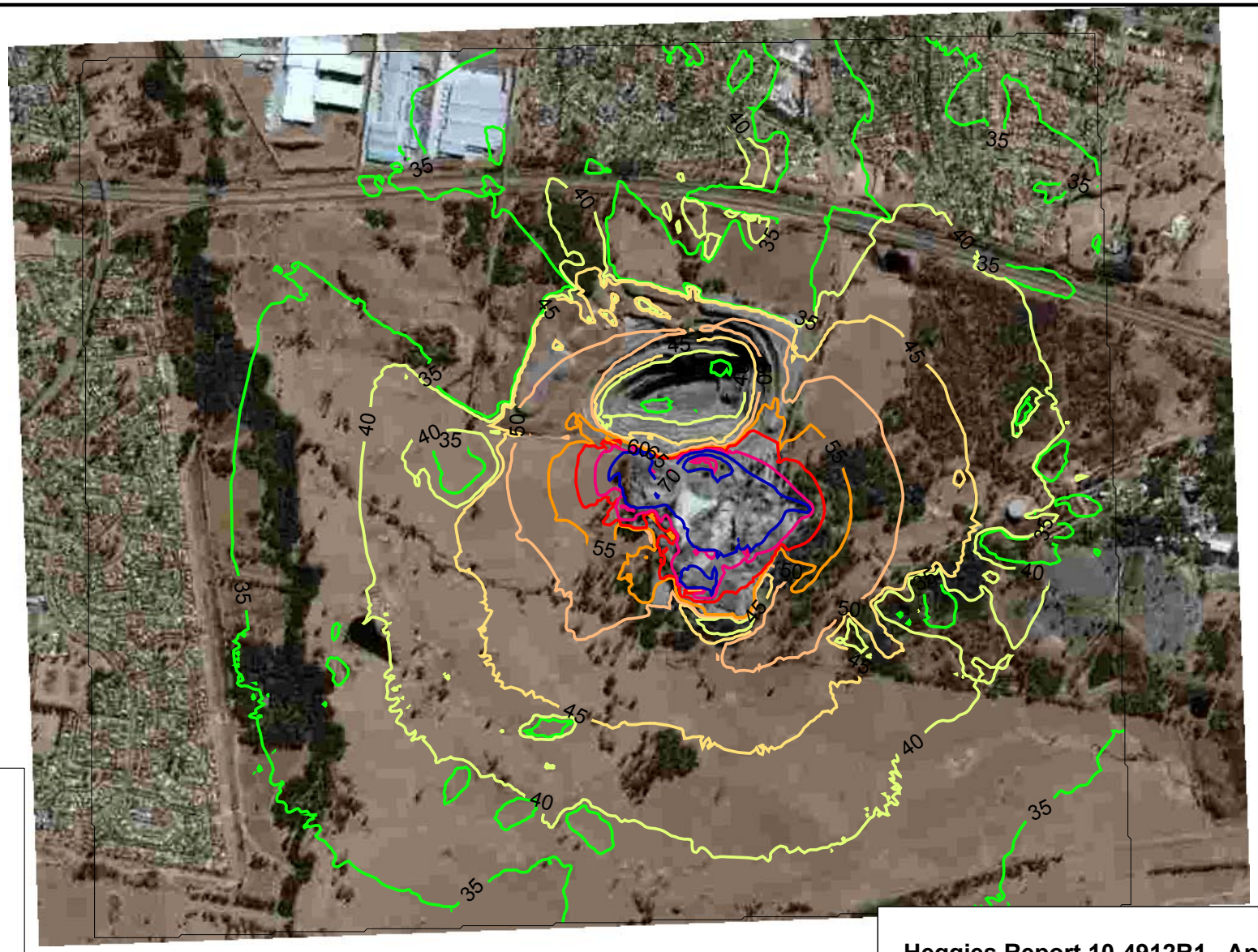
Saturday 7.00 am to 1.00 pm if inaudible on residential premises, otherwise 8.00 am to 1.00 pm.

No construction work to take place on Sunday or Public Holidays.

Silencing

All possible steps should be taken to silence construction site equipment. It is particularly important that silenced equipment should be used on road or rail works where 24 hour operation is necessary.

DAYTIME INTRUSIVE $L_{AEQ(15MINUTE)}$ NOISE CONTOURS CALM CONDITIONS

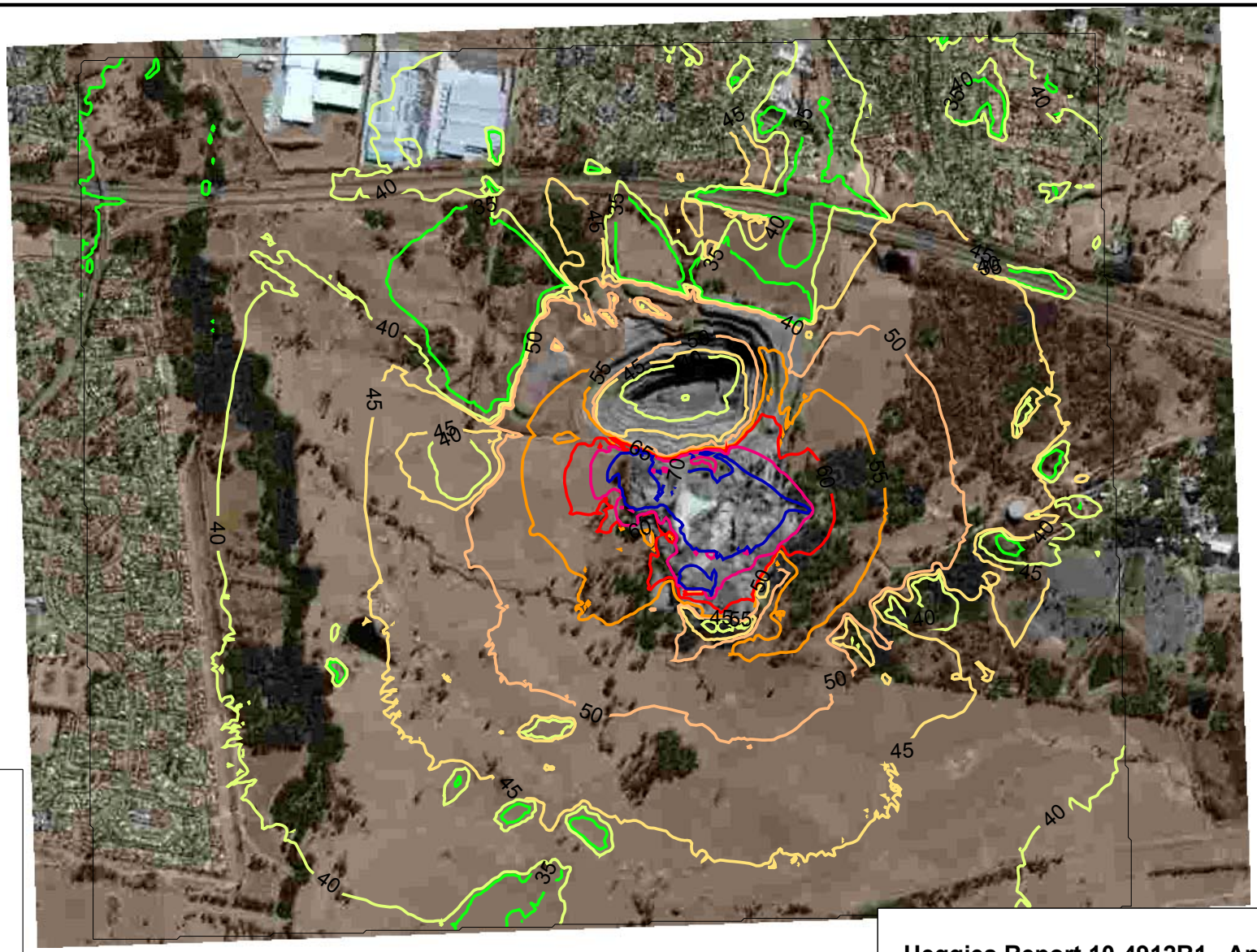


Noise level
in dB(A)

	<=	35
35 <	<=	40
40 <	<=	45
45 <	<=	50
50 <	<=	55
55 <	<=	60
60 <	<=	65
65 <	<=	70
70 <		

Heggies Report 10-4912R1 Appendix G1
Daytime Intrusive LAeq Noise Contours
Calm Meteorological Conditions

NIGHT-TIME INTRUSIVE $L_{AEQ(15MINUTE)}$ NOISE CONTOURS INVERSION CONDITIONS



Heggies Report 10-4912R1 Appendix G2
Night-time Intrusive LAeq Noise Contours
Temperature Inversion Conditions