

## **7.7 NOISE**

### **7.7.1 Introduction**

A noise impact assessment was undertaken by Heggies Australia Pty Ltd (Heggies). The objective of the noise assessment was to identify the potential impact of noise from the proposed development, including construction and operation of the facility and associated rail and road traffic movements and to provide advice with regard to effective mitigation strategies where necessary. The results of this assessment are documented in Technical Report No 6.

The noise assessment was prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in accordance with the DEC NSW Industrial Noise Policy (INP). Reference was also made to the NSW Environmental Criteria for Road Traffic Noise (ECRTN). Where issues relating to noise are not addressed in the INP, such as sleep disturbance, rail traffic noise and construction noise goals, reference has been made to the NSW Environmental Noise Control Manual (ENCM).

Potential noise sensitive areas that surrounded the proposed RDC were identified and were noted to be industrial, recreation and residential areas. Industrial properties neighbour the proposed RDC site to the west and north.

Recreation areas considered to be noise sensitive are the Nurragingy Reserve which borders the site on the eastern side, including the Colebee Centre which is located within the reserve and the Blacktown Olympic Centre located to the south. Residential noise sensitive sites that have been considered in the impact assessment include the residential areas on Station St, Rooty Hill and Knox Rd, Doonside which are located to the west and east of the site respectively. The residential area on Mavis St, Rooty Hill was included in the sleep disturbance assessment as this area is located to the south of the proposed rail siding.

The residential housing in the general area has been classified as 'urban' receivers as they are located near commercial and industrial districts with heavy and continuous traffic flows.

The Nurragingy Reserve and the Colebee Centre have been classified as passive recreation areas while the Blacktown Olympic Centre was assessed as an active recreation area as defined by the INP. It has been assumed that these venues may be used during the night-time period with the exception of Nurragingy Reserve.

### **7.7.2 Existing Noise Environment**

#### **Noise Monitoring**

Background noise levels were measured so that an intrusiveness assessment could be undertaken. The criterion for intrusiveness states that the equivalent continuous noise level (LAeq) of the source should not be more than five decibels above the measured background level (LA90).

Background noise levels were surveyed via unattended continuous noise monitoring at two residential sites from 31 August, 2004 to 8 September 2004. The sites were considered as representative of the nearest potentially affected receivers and were located at Station St, Rooty Hill and Crawford Rd, Doonside. The background noise monitoring objective was to measure LA90(period) and LAeq(15minute) noise levels during day, evening and night time periods. Weather data was also collected during this survey period.

Operator monitored noise measurements were performed during daytime assessments at the monitoring stations as well as Nurragingy Reserve. Each noise measurement consisted of a 15 minute sampling period.

It was found that traffic was the main contributor to ambient noise levels at the sampled residential areas. Nurragingy Reserve is currently affected by existing rail noise and local traffic. Some existing industrial operations also contribute to the current noise levels of the area in the vicinity of the RDC site.

#### **Effects of Meteorology on Noise Levels**

Wind has the potential to increase noise at a receiver when it is light and stable and blows from the direction of the source of the noise. As the strength of the wind increases the noise produced by the wind would obscure noise from most industrial and transport sources.

Wind effects need to be considered when wind is a feature of the area under consideration. Where wind blows from the source to the receiver at speeds up to 3 m/s for more than 30% of the time in any season, then wind is considered to be a feature of the area and noise level predictions must be made under these conditions.

Weather data was obtained, for a period of 12 months, from a DEC weather station located adjacent to Mamre Road, St Mary's. This location is approximately 7-8 km west of the proposed development site. This data was analysed to determine the frequency of occurrence of winds up to speeds of 3 m/s for daytime, evening and night in each season.

Seasonal wind records indicate that certain winds are a feature of the area. The frequency of winds below 3 m/s (predominantly up to 2 m/s) is above the 30% threshold during several seasons and periods. Modelling under prevailing wind was therefore conducted as part of the study.

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions occur predominantly at night during the winter months. For a temperature inversion to be a significant characteristic of the area it needs to occur for approximately 30% of the total night-time during winter, or about two nights per week.

Meteorological data, obtained from the DEC weather station at St Mary's, indicates that temperature inversions are a feature of the area. The proposal is for operations to be undertaken 24 hours a day, seven days a week. Hence, the occurrence of temperature inversion during the night-time period has been considered as part of this noise assessment.

### 7.7.3 Noise Criteria

The noise emission design criteria for the proposed RDC have been established with reference to the INP.

The existing LAeq noise levels in the vicinity of the proposed RDC site are dominated by traffic and include some noise from existing industrial operations. The amenity criteria have been established using the results of ambient noise measurements and with reference to assessment in areas of high traffic noise in accordance with the INP. Where it was found that existing industrial noise contributed to ambient noise levels at potentially affected areas in the vicinity of the proposed RDC appropriate adjustments have been made to the amenity criteria for these locations.

The acoustical environment typifies an urban environment, with heavy and continuous traffic flows, and residences near both commercial and industrial districts. Therefore, the residences in the general area have been assessed as "urban" receiver types.

The Colebee Centre has been assessed as a passive recreation area and the Blacktown Olympic Centre has been assessed as an active recreation area, as defined in the INP. It has been assumed that each of these venues may be used during the night-time period.

The resulting operational project specific noise criteria for the proposed RDC are shown in Table 7.10. Intrusiveness criterion for the morning shoulder period has been calculated as the midpoint between the two assessment periods either side of the morning shoulder, ie day and night-time. Amenity criterion has been selected as the midpoint value of the amenity criteria for the two assessment periods either side of the morning shoulder.

**Table 7.10**  
**Proposed RDC Project Specific Noise Criteria**

Location	Period	Intrusiveness Criteria LA <sub>eq(15 minute)</sub>	Amenity Criteria LA <sub>eq(period)</sub>	Project Specific Noise Criteria
Location 1* (Station Street)	Morning Shoulder	47 dBA	52 dBA	47 dBA
	Day	52 dBA	60 dBA	52 dBA
	Evening	48 dBA	46 dBA	46 dBA
	Night	43 dBA	45 dBA*	43 dBA
Location 2 (Crawford Street)	Morning Shoulder	44 dBA	52 dBA	44 dBA
	Day	45 dBA	60 dBA	45 dBA
	Evening	45 dBA	50 dBA	45 dBA
	Night	43 dBA	45 dBA	43 dBA
Nurragingy Reserve	When in use – day and evening periods only	N/A	Acceptable 50 dBA Recommended Max. 55 dBA	50 dBA 55 dBA max.

Location	Period	Intrusiveness Criteria LA <sub>eq</sub> (15 minute)	Amenity Criteria LA <sub>eq</sub> (period)	Project Specific Noise Criteria
Colebee Centre	When in use	N/A	Acceptable 50 dBA Recommended Max. 55 dBA	50 dBA 55 dBA max.
Blacktown Olympic Centre	When in use	N/A	Acceptable 55 dBA Recommended Max.60 dBA	55 dBA 60 dBA max.

\* This criterion has been determined as per the INP for assessment in areas of high traffic noise  
Daytime 7.00am to 6.00pm; Evening 6.00pm to 10.00pm; Night 10.00pm to 7.00am; Morning Shoulder 6.00am to 7.00 am  
On Sundays and Public holidays, Daytime 8.00am to 6.00pm; Evening 6.00pm to 10.00pm; Nighttime 10.00pm to 8.00 am

The INP states that these criteria have been selected to protect 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, it is unlikely that most people would consider the resultant noise levels excessive.

### Sleep Disturbance Noise Goals

The relevant sleep disturbance noise goals for each residential area are provided in Table 7.11

**Table 7.11**  
**Sleep Disturbance Noise Goals**

Location	Period	Measured Background Noise Level (L <sub>A90</sub> )	Sleep Disturbance Noise Goal
Station Street*	Morning Shoulder	40 dBA**	55 dBA
	Night	38 dBA	53 dBA
Crawford Street	Morning Shoulder	48 dBA	58 dBA
	Night	43 dBA**	53 dBA

\*Sleep disturbance goals for Station Street have been adopted at Mavis Street residences.

\*\* These background noise levels are the lowest LA90 recorded for the morning shoulder period during the noise monitoring survey.

### Rail Traffic Noise Goals

External rail noise level goal for residential receivers are specified as an L<sub>Aeq</sub> (24 hour) noise level and as a maximum pass-by level. Recommended planning and maximum noise levels provide in the ENCM are provided in Table 7.12.

**Table 7.12**  
**Rail Traffic Noise Goals**

	Planning Levels	Maximum Levels
LA <sub>eq</sub> (24 hour)	55 dBA	60 dBA
LA <sub>max</sub>	80 dBA	85 dBA

### Road Traffic Design noise Criteria

Road traffic noise criteria are set out in the ECRTN. The criteria recommended in the policy document are based on the functional categories of the subject roads, as applied by the RTA. All raw material deliveries and aggregate product despatches would utilise the M7. This road is

classified as an arterial road which, by definition, carries predominantly through-traffic from one region to another, forming a principal avenue of communication for urban traffic movements.

Concrete agitators would utilise roads in the general area depending on the location of the end customer. The relevant road traffic noise criteria for the subject development are provided in Table 7.13.

**Table 7.13**  
**Road Traffic Noise Design Criteria**

Type of Development	Criteria		
	Day 7am – 10pm	Night 10pm – 7am	Where Criteria are Already Exceeded
Land use developments with potential to create additional traffic on existing freeways/arterials	LA eq (15 hour) 60 dBA	LA eq (9 hour) 55 dBA	Where feasible existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; using clustering; using 'quiet' vehicles and using barriers and acoustic treatments.  In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.

The ECRTN also draws the following conclusions with regard to maximum noise levels and the likelihood of sleep disturbance:

- Maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions; and
- One or two noise events per night, with maximum internal noise levels of 65-70 dBA, are not likely to affect health and wellbeing significantly.

### Construction

The daytime background noise level (LA90) has been determined at two potentially affected residential locations. A daytime LA90 of 47 dBA was measured at Location 1 (Station Street) and 40 dBA at Location 2 (Crawford Road). This infers the project specific construction noise goals presented in Table 7.14 for the nearest potentially affected residential locations.

**Table 7.14**  
**Construction Noise Goals – Residential Areas**

Construction Period	Construction Noise Goal (LA10) <sup>1</sup>	
	Location 1 Station Street*	Location 2 Crawford Road
4 weeks and under	67 dBA	60 dBA
4 weeks to 26 weeks	57 dBA	50 dBA
Greater than 26 weeks	52 dBA	45 dBA

1. Applicable between the hours of 7.00 am and 6.00 pm Monday to Friday and 8.00am to 1.00pm Saturdays. For all other time construction noise must be inaudible at the receiver. No construction work is to take place on Sundays of Public Holidays.

\* These criteria have also been adopted at Mavis Street Residences to the south of Rooty Hill Railway Station.

The relevant noise goals for the Nurragingy Reserve is  $LA_{eq(Period)} 55$  dBA, based on the recommended maximum amenity criterion for a passive recreation area as per the INP.

#### **7.7.4 Mitigation**

The following noise management and mitigation measures have been recommended for the proposed RDC and were included in the noise assessment. The purpose of the mitigation procedures is to achieve project specific noise criteria and are categorised into noise barriers and enclosures, equipment treatments and plant management, sleep disturbance and the mitigation measures undertaken by the M7 on/off ramp constructions.

##### **Noise Barriers and Enclosures**

- Enclose conveyer drives and transfer points;
- Conveyer CV-01 to have sound power level of 97 dBA/100m and other conveyers to have sound power level of 92 dBA/100m;
- Enclose dust collector units located south of Angus Creek and the main storage bins;
- Dust collector units located north of the main storage bins and adjacent to the reclaim hopper to have an enclosed air pulse unit and clean air chamber and would be located to have maximum shielding from other structures on site;
- The CBP wing wall would be the same height as the enclosure opening and extend at least 3 m from the end of the enclosure;
- The rail unloading station wing wall to extend at least 25 m from either end and be the same height as the unloading enclosure;
- Construction of a continuous noise wall along the eastern boundary to be at least 4 m in height from the north-eastern corner of the site along the truck route to conveyer CV-02;
- Construction of a continuous noise wall along the eastern end of the rail siding to be at least 3 m in height, extending west to the rail unloading station;
- Construction of a continuous noise wall on the northern side of the rail siding at the western end, extending east to the M7 and of at least 3 m in height ;
- Construction of a continuous noise wall on the southern side of the main rail line to extend from the M7 overpass to Rooty Hill station to be at least 2 m in height;
- Noise wall material to be timber or aerated concrete product; and
- Earth bunds may be used instead of noise walls if appropriate.

##### **Equipment Treatments**

- The rail unloading bins and the cones section of the main storage bins to hold aggregate to be lined with noise mitigating material.

##### **Plant Management**

- Loading of the main storage bins from an empty state to not take place in the evening, night or morning shoulder period;

- During night activity, only one loading and one slumping agitator are to be in operation at the CBP; and
- Blending plant would not be in operation during evening or night periods

### Sleep Disturbance

- Storage bins would not be loaded from an empty state; and
- Use of visual reversing alarms and start-up warnings for front end loaders and conveyers.

### M7 On/Off Ramps

M7 design drawings indicate the following with regard to noise mitigation:

- Proposed 4 m noise wall adjacent to the on-ramp at Power St to shield residences in Lambert Ave, Glendenning which are located approximately 28 m from the ramp; and
- Proposed 4.5 m noise wall adjacent to the off-ramp at Woodstock Ave to shield residences in Station St, Rooty Hill which are located approximately 30 m from the ramp.

## 7.7.5 Impacts

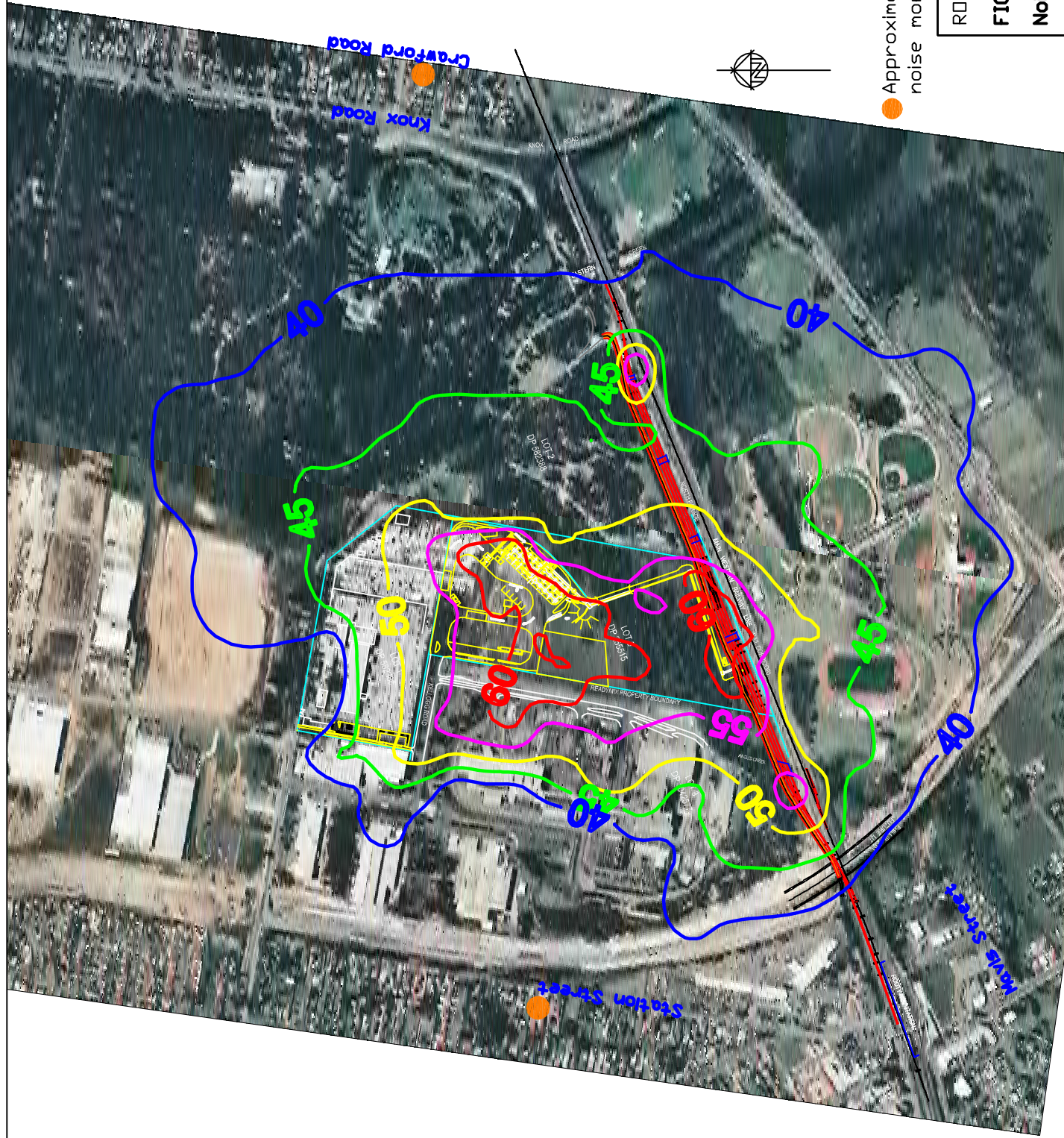
### Operational

The Environmental Noise Model (ENM) was used to predict operational noise emissions from the proposed RDC. This computer model used topographic information, noise source data, ground cover, barrier shielding and atmospheric information to predict the levels at the nearest potentially affected receivers.

Noise from all sources that contribute to the total noise from the site have been examined to identify characteristics that may cause greater annoyance (for example tonality, impulsiveness etc). The appropriate modifying factors, as outlined in the INP, have been applied where these characteristics are considered to be present. Noise levels predicted at the specific receiver locations are provided in Tables 7.15 and Table 7.16 for operation with and without the radial stacker, respectively. Noise contour maps, provided in Figures 7.12 to 7.15, show predicted noise levels from operation of the proposed RDC at the development site and surrounding areas.

**Table 7.15**  
**Predicted RDC Noise Levels – Without Radial Stacker**

Location	Period					Project Specific Noise Criteria
		Calm	Temperature Inversion	Easterly Wind	SSW Wind	
Location 1 (Station Street)	Morning Shoulder	35	39	n/a	34	52 dBA
	Day	35	n/a	n/a	n/a	52 dBA
	Evening	35	n/a	44	34	46 dBA
	Night	35	39	n/a	34	43 dBA
Location 2 (Crawford Street)	Morning Shoulder	34	38	n/a	39	52 dBA
	Day	34	n/a	n/a	n/a	45 dBA
	Evening	33	n/a	<30	38	45 dBA
	Night	33	37	n/a	38	43 dBA
Mavis Street	Morning Shoulder	30	34	n/a	<30	52 dBA
	Day	30	n/a	n/a	n/a	52 dBA
	Evening	<30	n/a	35	<30	46 dBA
	Night	<30	33	n/a	<30	43 dBA



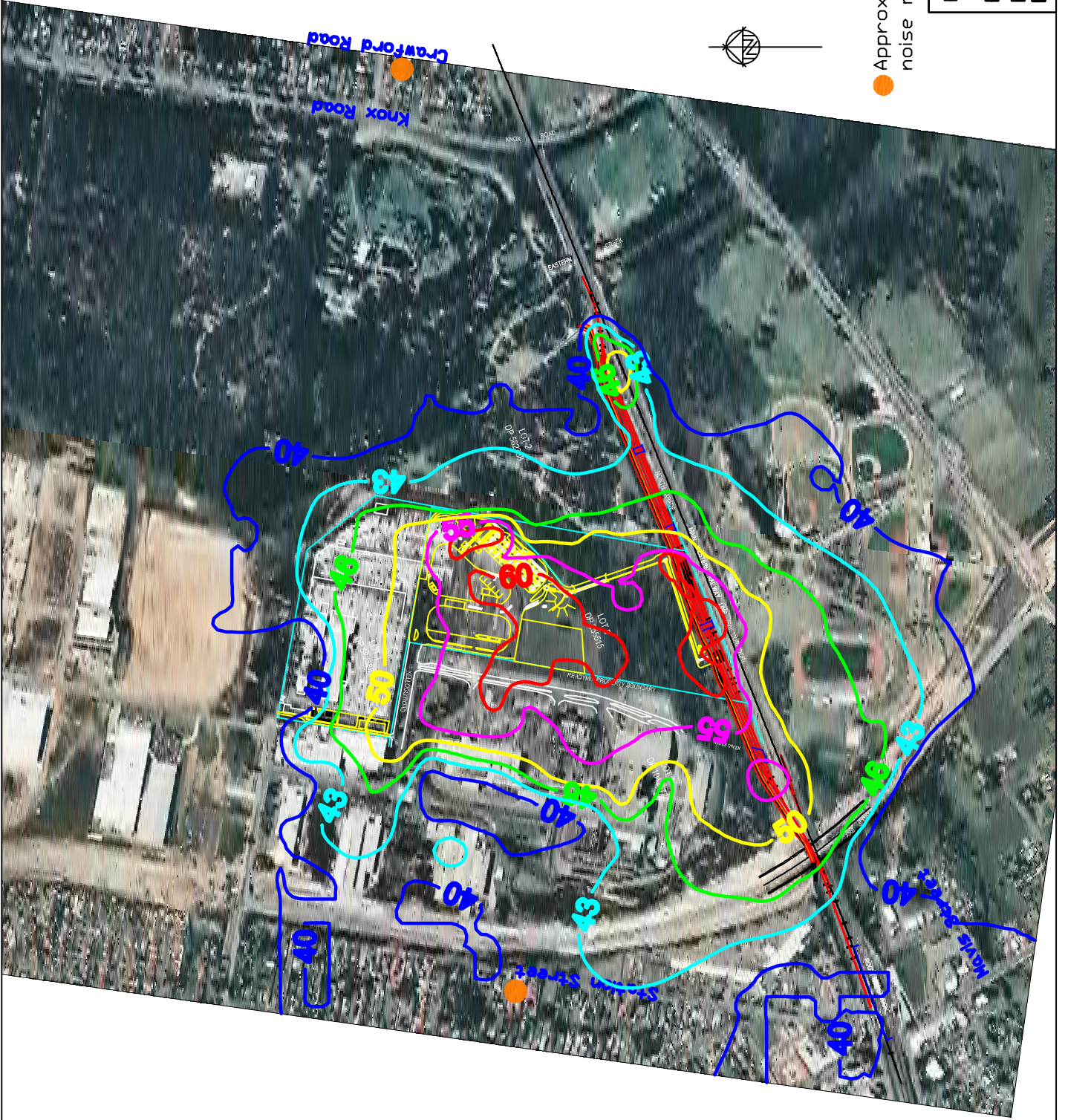
Approximate locations of unattended noise monitoring

ROOTY HILL RDC

FIG. 7.12

Noise Contours - Calm Day



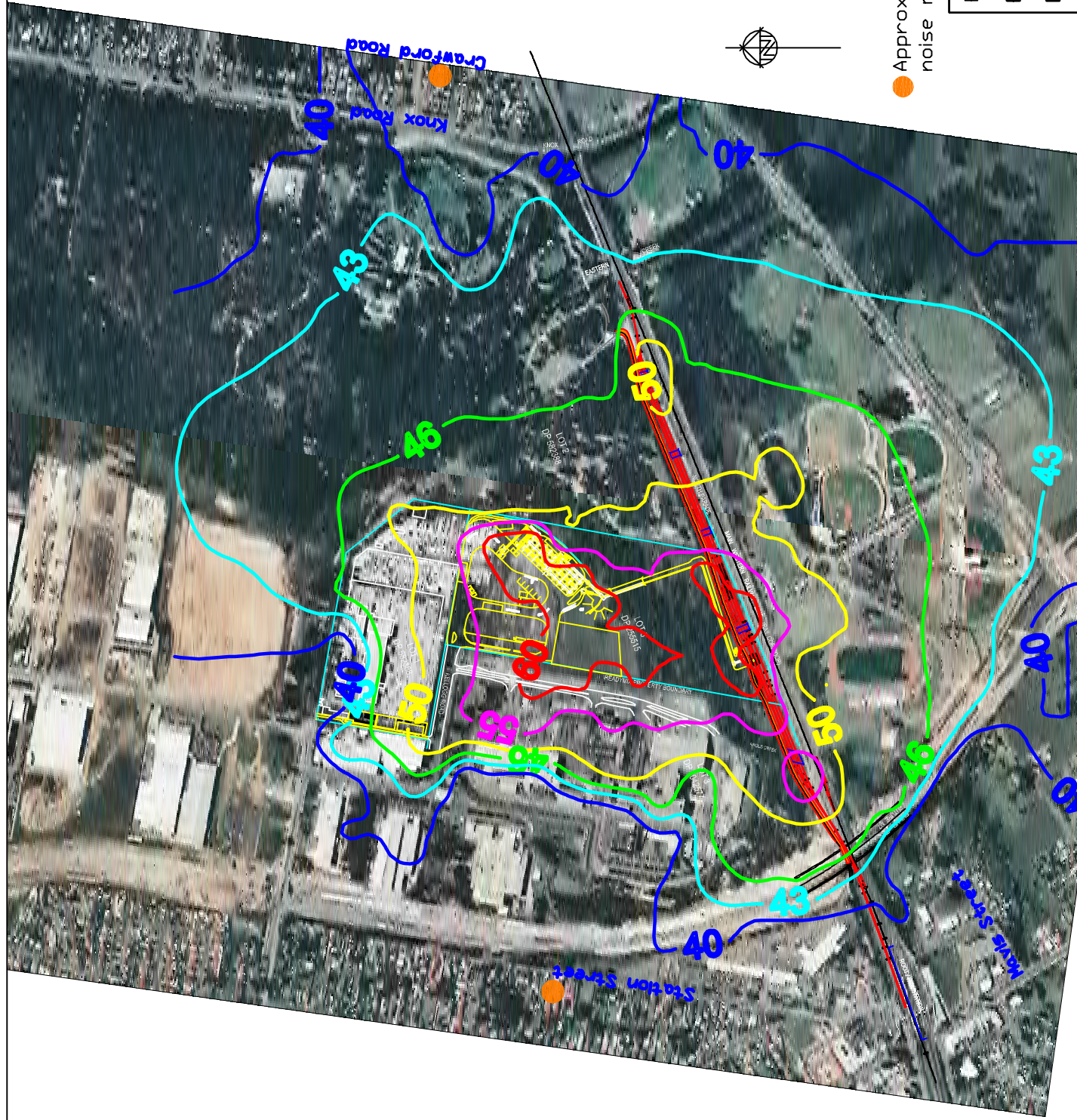


 Approximate locations of unattended noise monitoring

ROOTY HILL RDC

FIG. 7.13

Noise Contours -  
 Easterly Wind Evening



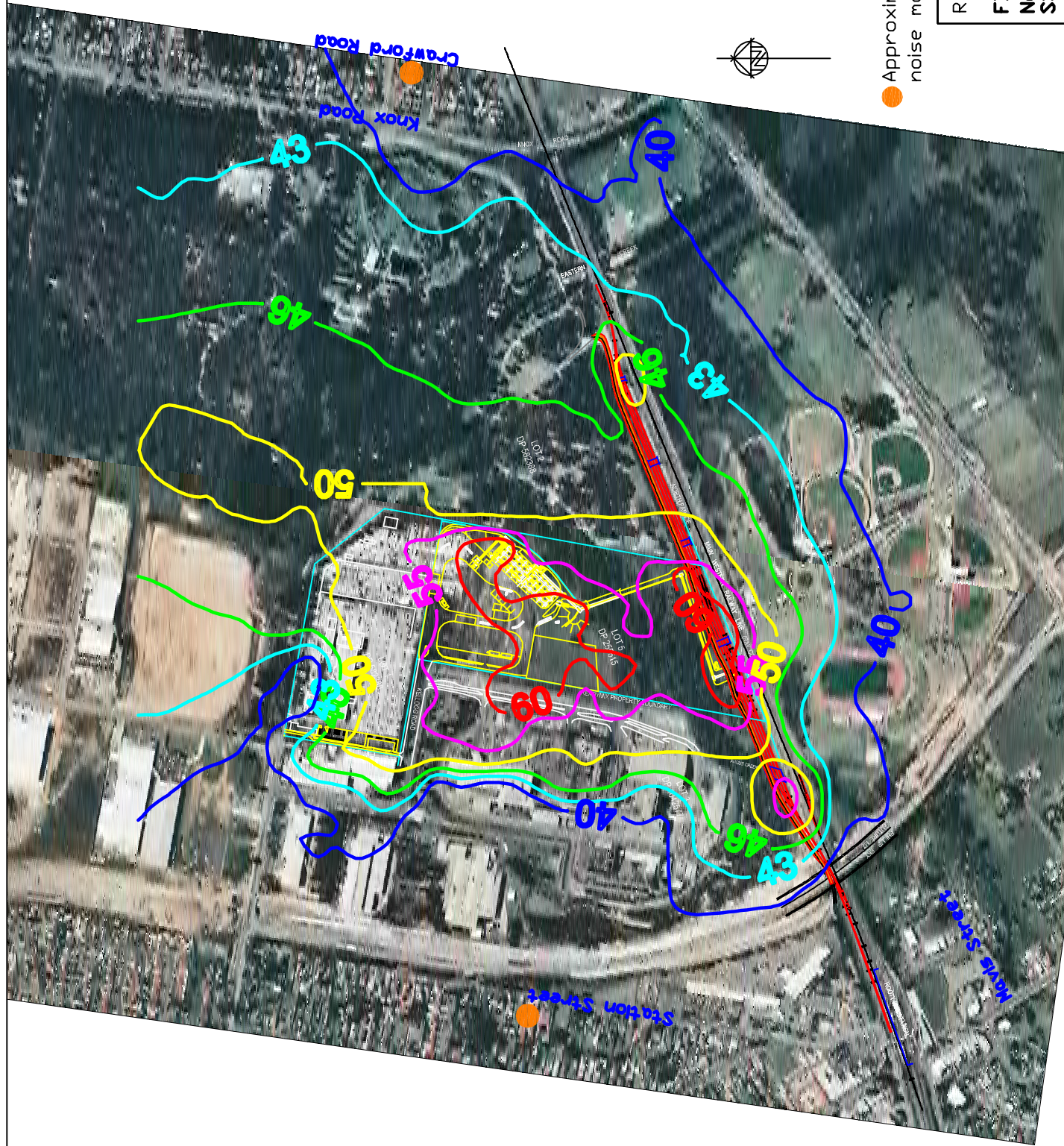
Approximate locations of unattended noise monitoring


ROOTY HILL RDC

FIG. 7.14

Noise Contours - Inversion Night





 Approximate locations of unattended noise monitoring

ROOTY HILL RDC

FIG. 7.15

Noise Contours -  
 SSW Wind Evening and Night

Location	Period					Project Specific Noise Criteria
		Calm	Temperature Inversion	Easterly Wind	SSW Wind	
Nurragingy Reserve	When in use – Day Evening	49 49	n/a n/a	n/a 45	n/a 49	50 dBA.
Colebee Centre	When in use – Day Evening/Night	42 41	n/a 47	n/a 36	n/a 49	50 dBA
Blacktown Olympic Centre	When in use: Morning Shoulder Day Evening	51 51 50	52 n/a 52	n/a n/a 49	48 n/a 47	55 dBA

n/a: the meteorological condition is not relevant during this period

**Table 7.16**  
**Predicted RDC Noise Levels – With Radial Stacker\***

Location	Period					Project Specific Noise Criteria
		Calm	Temperature Inversion	Easterly Wind	SSW Wind	
Location 1 (Station Street)	Morning Shoulder	35	39	n/a	34	52 dBA
	Day	35	n/a	n/a	n/a	52 dBA
	Evening	35	n/a	44	34	46 dBA
	Night	35	39	n/a	34	43 dBA
Location 2 (Crawford Street)	Morning Shoulder	34	38	n/a	40	52 dBA
	Day	34	n/a	n/a	n/a	45 dBA
	Evening	33	n/a	<30	39	45 dBA
	Night	33	37	n/a	39	43 dBA
Mavis Street	Morning Shoulder	30	34	n/a	<30	52 dBA
	Day	30	n/a	n/a	n/a	52 dBA
	Evening	<30	n/a	35	<30	46 dBA
	Night	<30	33	n/a	<30	43 dBA
Nurragingy Reserve	When in use – Day Evening	49 49	n/a n/a	n/a 45	n/a 50	50 dBA.
Colebee Centre	When in use – Day Evening/Night	42 41	n/a 47	n/a 36	n/a 49	50 dBA
Blacktown Olympic Centre	When in use: Morning Shoulder Day Evening	51 51 51	53 n/a 53	n/a n/a 50	48 n/a 48	55 dBA

\* Loading of main storage bins not occurring

n/a: the meteorological condition is not relevant during this period

Operational noise levels are predicted to meet the project specific noise criteria at all residential locations under calm and prevailing weather conditions. In addition, noise levels at the Colebee function centre and the Blacktown Olympic Centre are predicted to meet the acceptable project specific noise criteria.

Due to the nature of sound, noise level values do not add together the same way as ordinary numbers. If an existing noise level is 10 dBA (or more) above the noise level produced by a new source then the new source would not increase the existing noise level. Existing noise levels, during the night-time period, have been measured at Station Street and Crawford Road with typical average noise levels (LAeq) of 55 dBA and 49 dBA, respectively. Operational noise predictions show that noise levels from the RDC during a typical night-time operational scenario would be no greater than 39 dBA at either of these locations. Hence, average night-time noise levels are not expected to increase at these residential areas as a result of operation of the RDC.

Predicted noise levels in all areas of the Nurragingy Reserve are below the recommended maximum amenity level, provided in the INP, of 55 dBA. As can be seen from the noise contour diagrams there are some small areas of the Reserve, adjacent to the RDC boundary, which may experience noise levels higher than the acceptable amenity level for a passive recreation area (50 dBA) with all equipment on site operating simultaneously.

The worst-case prevailing meteorological scenario, with regard to noise for the Nurragingy Reserve, is under the influence of a SSW wind which occurs during the evening or night-time period only. It is understood that the Nurragingy Reserve does not operate during the night-time period and typically closes at 5.30 pm (6.30 pm during October, November and March and 7.00 pm during summer). Since prevailing winds have not been identified during the evening period (6.00 pm to 10.00 pm) during October and November, this minor exceedance of the acceptable amenity criteria may occur for up to one hour a day for four months of the year.

### **Cumulative Noise Assessment**

The proposed development site is situated within a developed industrial area in Western Sydney. Existing industrial properties are located to the west and north of the subject site.

Potential cumulative noise impacts from existing and successive developments are embraced by the INP procedures by ensuring that the appropriate noise emission criteria (and consent limits) are established with a view to maintaining acceptable noise *amenity* levels for residences.

Therefore, the cumulative impact of the proposed RDC with existing industrial noise sources has been assessed in the determination of the amenity levels at surrounding potentially noise sensitive areas.

### **Sleep Disturbance Analysis**

In assessing sleep disturbance, typical  $L_{Amax}$  noise levels of acoustically significant plant and equipment to be used at the subject site were used as input to the ENM acoustic model and predictions were made at the nearest residential areas in Station Street, Mavis Street and Crawford Road under adverse weather conditions at night. Noise events considered include loading into an empty truck, truck reversing alarms, a front end loader scraping concrete and those associated with rail shunting. The use of the  $L_{Amax}$  noise level provides a worst-case prediction since the  $L_{A1(1minute)}$  noise level of a noise event is likely to be less than the  $L_{Amax}$ .

The highest  $L_{Amax}$  noise level at any residential area is predicted to occur when trains are maneuvering at the extremities of the rail siding in the presence of a temperature inversion. External noise levels up to  $L_{Amax}$  47 dBA may occur at some Station Street residences in this situation, up to 52 dBA at residences in Mavis Street and up to  $L_{Amax}$  50 dBA at Crawford Road residences. Hence, predicted noise levels meet the recommended sleep disturbance noise goal of 53 dBA.

The ECRTN provides further guidance with regard to sleep disturbance and calls upon a number of studies that have been conducted into the effect of maximum noise levels on sleep. The DEC policy document acknowledges that, at the current level of understanding, it is not possible to establish absolute noise level criteria that would correlate to an acceptable level of sleep disturbance. However, the ECRTN provides that maximum internal noise levels below 50 dBA to 55 dBA are unlikely to cause awakening reactions and one or two events per night, with maximum internal noise levels of 65 dBA to 70 dBA (inside dwellings) are not likely to significantly affect health and wellbeing. Maximum noise predictions have shown that external noise levels up to 52 dBA may occur at some residences during the night-time period as a result of RDC operation. This correlates to noise levels significantly below 50 dBA inside dwellings. Based on the preceding, maximum noise levels produced by operation of the RDC are not likely to cause sleep disturbance at the nearest residential areas to the subject site.

## Rail Noise

All rail deliveries to and from the proposed RDC would utilise the Main Western Railway Line. There would be an average of four trains per day delivering aggregate products to the site at the maximum capacity of 4 Mtpa. Estimated existing rail traffic movements for this section of the Main Western line were provided by RailCorp and are provided in Table 7.17.

**Table 7.17**  
**Estimated Existing Rail Traffic Movements**

Period	Passenger		Freight and other trains*	
	To City	From City	To City	From City
Day (7am – 6pm)	61	62	5	5
Evening (6pm – 10pm)	17	24	2	2
Night (10pm – 7am)	26	16	5	5
Totals	104	102	12	12

\* The current freight timetable is yet to be finalised; these estimated freight train movements are approximate only. It has also been assumed that freight trains are timed evenly throughout a 24-hour period.

Rail traffic noise levels have been predicted based on these existing rail traffic movements and the proposed RDC rail traffic movements. Rail traffic noise predictions are provided in Table 7.18.

**Table 7.18**  
**Rail Traffic Noise Predictions**

Noise Descriptor	Rail Traffic Noise Prediction	
	Existing Rail Traffic	Total Rail Traffic Including 4 RDC Rail Traffic Movements
LA eq (24 hours)	63.2 dBA	63.5 dBA
LA max	84.6 dBA	84.6 dBA

The increase in rail traffic generated by the RDC of an average of four trains per day (an average increase of eight rail movements per day on any particular section of the line utilised by RDC rail traffic) is predicted to increase the existing LAeq(24hour) rail noise level by less than 0.5 dBA. This is considered to be a negligible increase in noise levels and such an increase would not be discernible. It is predicted that the existing LAmix noise levels due to rail traffic movements would not increase.

## Road Traffic Assessment

Calculation of road traffic noise levels has been conducted using the United States Federal Highways road traffic noise model (USFH). The USFH method for prediction of LAeq(period) road traffic noise levels is an internationally accepted theoretical traffic noise prediction model which takes into account the LAmix noise levels of vehicles, receiver offset distance, passby duration, vehicle speed, ground absorption (based on the ratio of soft ground and average height of propagation), number of vehicle movements, receiver height, truck exhaust height and the height and location of any intervening barriers.

The noise from road traffic was predicted at a distance of 30 m, which relates to the distance of the nearest residential dwellings from the M7, at a receiver height of 1.5 m above the ground. For noise assessment purposes it has been assumed that 40% of RDC heavy vehicle traffic would travel north and 60% would travel south. Since north and south bound vehicles do not travel the same section of the M7, only the southbound scenario has been considered since it provides the maximum increase in traffic movements and hence a worst-case increase in noise levels.

The LAeq(1hour) noise level predicted at the two nearest residential areas to the on/off ramps, including RDC vehicle movements, is provided in Table 7.19.

These predictions are based on the AM peak period (7.30 am to 8.30 am) and so provide a worst-case noise level. Traffic numbers used in the noise predictions include peak hour on/off ramp traffic and average hourly traffic on the M7 carriageway. The proposed M7 noise barriers have also been considered in these predictions.

**Table 7.19**  
**Road Traffic Noise Predictions – On/Off Ramps**

<b>On/Off Ramp / Residential Location</b>	<b>Predicted Road Traffic Noise Including RDC Traffic * LA eq (1 hour)</b>
Power Street Off Ramp / Lambert Avenue	55 dBA
Woodstock Avenue on Ramp / Station Street	57 dBA

\* Based on the AM Peak period (7.30am to 8.30am)

The predicted worst-case LAeq(1hour) road traffic noise level including RDC traffic would be less than the LAeq(15hour) since the peak hourly vehicle movements would not occur for every hour of the daytime period. Therefore, the road traffic noise level is predicted to be below the relevant noise goal (LAeq(15hour) 60 dBA) specified in the ECRTN.

Maximum noise levels from road traffic are not expected to increase at the nearest residences to the on/off ramps as a result of RDC traffic. Most loads to/from the RDC would be dispatched during the period 6.00 am to 6.00 pm Monday to Saturday so the volume of traffic to/from the RDC would be lower during the night time period.

### **Construction Noise**

Proposed construction equipment was modelled at potential worst case locations on the subject site including the eastern, western and southern boundaries of the site and at either extremity of the rail siding.

Construction noise levels have been predicted assuming all barriers adjacent to the rail siding and along the eastern boundary of the site are in place.

It is anticipated that construction of the RDC would take approximately two years to complete. Hence, predicted construction noise levels have been compared to the "greater than 26 weeks" criteria.

Construction noise levels are predicted to be below the relevant noise goals at each of the residential areas considered once the relevant noise barriers are in place. There may be short periods of time, while noise barriers are being constructed or when multiple pieces of construction equipment are in use, where construction noise levels exceed the relevant noise goals at residential areas.

Sections of the Nurraringy Reserve are likely to experience noise levels greater than the relevant noise goal when heavy construction equipment is operating on the eastern boundary of the Readymix site. Under this scenario, noise levels of approximately 61 dBA LAeq may be experienced in the Reserve adjacent to this boundary, even with the noise wall along this boundary in place, when, for example, a front-end loader is operating in this location. Similar noise levels can be expected in sections of the Reserve adjacent to the proposed siding when works are being conducted for the construction of the siding. The noise impact in the Reserve would obviously decrease as works move away from the Readymix/Nurraringy boundary or the eastern end of the proposed rail siding.

Most major earthworks to be conducted on the site would be completed within the first six months of the 24 month program. Construction of the Readymix rail siding and associated track works are expected to be completed within a 12 month period from commencement of these works and would not occur concurrently with major earthworks on the site. During these times, earthworks would not be occurring continuously on the respective boundaries adjacent to the Reserve.

For approximately the first six months of the construction period a relatively small number of trucks would utilise the road network within part of the Reserve to gain access to North Parade from Knox Road. It is estimated that a *maximum* of 10 trucks each way (20 truck movements) would utilise the Reserve road network during the morning peak hour. The Environmental Criteria for Road Traffic Noise (ECRTN) provides a criteria for road traffic noise levels in a passive recreation area of 55 dBA LAeq(1hour). Based on this maximum volume, the predicted LAeq(1hour) due to construction traffic in the Reserve is 54 dBA. Hence, construction traffic noise levels are predicted to be below the relevant criteria.

As previously mentioned existing ambient noise levels in some sections of the Reserve are already higher than the recommended maximum amenity level. In addition, given the temporary nature of construction activities, community expectations with regard to construction noise levels are often not as high as those for operational or ongoing noise levels. Notwithstanding this, the following measures would be implemented:

- The noise wall proposed along the eastern boundary of the Readymix site and those adjacent to the rail siding would be constructed as early as possible in the construction period;
- Site noisy equipment behind structures that act as barriers or at the greatest distance from the noise-sensitive area or orient the equipment so that noise emissions are directed away from any sensitive areas;
- Keep equipment well maintained;
- Employ “quiet” practices when operating equipment (eg positioning and unloading of trucks in appropriate areas); and
- A Construction Noise Management Plan would be prepared and implemented prior to commencement of construction works at the site. This would include the following:
  - Construction noise and vibration goals;
  - Recommendations regarding specific physical and managerial measures for controlling noise, noise and vibration monitoring programs and reporting procedures; and
  - Measures for dealing with exceedances and mechanisms to provide ongoing community liaison.

With regard to potentially offensive noise events associated with construction activities AS 2436-1981 “*Guide to noise control on construction, maintenance and demolition sites*” provides the following:

*If noisy operations must be carried out, then a responsible person should maintain liaison between the neighbouring community and the contractor. This person should inform the public at what time to expect noisy operations and also inform the contractor of any special needs of the public.*

*Consultation and cooperation between the contractor and his neighbours and the removal of uncertainty and rumour can help to reduce the adverse reaction to noise.*



## **Construction Vibration**

The major vibration generating activities would occur during the earthworks in preparing the site; activities such as excavation and the use of vibratory rollers. The nearest residential premises to such construction activity is approximately 125 m (proximity of Mavis Street residence to rail siding). Due to the large separation distance to this and other residences, the level of vibration caused by construction activities at the Rooty Hill site is extremely unlikely to be perceptible at any of the nearest residential premises.

The nearest industrial building to potential vibration generating activities is that which is located adjacent to the Main Western Railway at the Blacktown Olympic Centre. This building is situated approximately 70 m from such potential construction activities. This magnitude of separation is expected to ensure that construction activities at the Rooty Hill site would have no impact on neighbouring industrial buildings.

### **7.7.6 Conclusion**

Heggies conducted a noise and vibration impact assessment for a proposed Regional Distribution Centre (RDC) to be located off Kellogg Road, Rooty Hill including consideration of construction, road and rail traffic and operational noise from the proposed development. Operational noise levels are predicted to meet the project specific noise criteria at all residential locations under both calm and prevailing weather conditions. In addition, predicted operational noise levels from the subject site do not exceed the acceptable noise levels at the Colebee function centre and the Blacktown Olympic Centre and do not exceed the recommended maximum noise amenity level in any areas of the Nurragingy Reserve.

Predicted maximum noise levels from operation of the proposed RDC during the night-time period are also predicted to meet the recommended sleep disturbance noise goal. The increase in rail traffic generated by the RDC is predicted to result in a negligible increase in rail traffic noise along the Main Western Railway corridor. Road traffic noise levels are predicted to satisfy the requirements of the ECRTN.

Construction noise levels are predicted to meet the relevant noise goals at the nearest potentially affected residential receivers. Various noise management techniques have been presented in this report to reduce the noise impact on the Nurragingy Reserve during the construction phase of the proposed development. Vibration levels generated by construction activities on the subject site are predicted to have a negligible impact on neighbouring residential and industrial locations.