Part Five
ACOUSTIC IMPACT ASSESSMENT

5.1 Introduction

The Secretary's Environmental Assessment Requirements includes a requirement for:

- *a quantitative assessment of potential construction, operational and transport noise and vibration impacts, including potential impacts on nearby noise sensitive receivers; and*

- *details and justification of the proposed noise mitigation and monitoring measures.*

In order to ascertain the potential impact of the proposed development on the acoustic environment of the locality, Wilkinson Murray Pty Ltd has prepared a report titled *Frank Street, Wetherill Park, Waste & Resource Management Facility. Noise Impact Assessment* (**the Wilkinson Murray Report**) a copy of which is at **Appendix 15**.

5.2 Methodology

The noise and vibration impact assessment has been prepared to address the relevant Secretary's Environmental Assessment Requirements. The assessment was conducted in general accordance with the following NSW Government guidelines:

- NSW Industrial Noise Policy (EPA, 2000);
- Noise Guide for Local Government (EPA, 2013);
- NSW Road Noise Policy (DECCW, 2011); and,
- Interim Construction Noise Guideline (DECC, 2009).

Given the substantial setback distances to nearby receivers, it is considered that a vibration assessment is not warranted and, therefore, not considered further in this assessment.

5.3 The Existing Environment

The immediate surrounding land use is industrial.

The nearest residential receivers are located to the south in Maugham Crescent, Wetherill

Park, approximately 840m away (**RES1**). There are residences to the east on Hassall Street (1,450m **RES 2**), to the south-east (Chifley Street and Galton Street near Victoria Street **RES 3**) and to the south-west along The Horsley Drive (1,250m **RES 4**).

The Gipps Road Sporting Complex is located to the north-east with the nearest oval at a distance of approximately 1,150m (**REC1**).

Figure 5-1 shows the location of noise sensitive receivers.

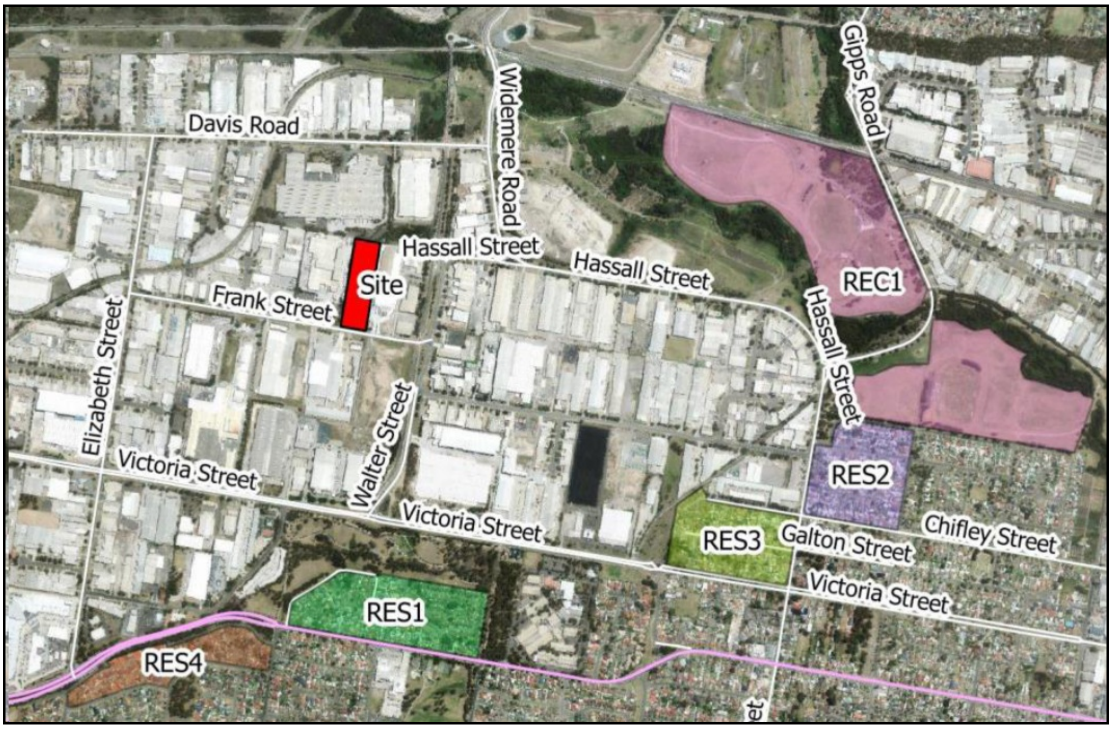


Figure 5-1: Location of sensitive receivers.

Ambient noise levels were monitored at 15 Maugham Crescent, Wetherill Park between Friday, 21 and Saturday, 29 August 2015 at monitoring location L1 which is considered representative of the most affected residential receivers in the vicinity of the Site and is shown in **Figure 5-2**.

Figure 5-2: Location of logger L1 at 15 Maugham Crescent.

The unattended noise monitoring equipment used consisted of environmental noise loggers set to A-weighted, fast response, continuously monitoring over 15-minute sampling periods. This equipment is capable of remotely monitoring and storing noise level descriptors for later detailed analysis. The equipment calibration was checked before and after the survey and no significant drift occurred.

The logger determines L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels of the ambient noise. L_{A1}, L_{A10} and L_{A90} are the levels exceeded for 1%, 10% and 90% of the sample time respectively. L_{Aeq} represents the average noise energy during a measurement period.

Times when there was rainfall or wind speeds above 5m/s were excluded in accordance with the Industrial Noise Policy (**INP**). Detailed results of the noise monitoring from both monitoring periods are shown graphically in Appendix A of the Wilkinson Murray Report.

Background noise levels may be expressed in terms of the Rating Background Level (**RBL**), a standard measure of background noise which is used in the INP.

Detailed results of the noise monitoring are shown graphically in Appendix A of the Wilkinson Murray Report.

Table 5-1 shows calculated RBL and $L_{Aeq,period}$ levels over all time periods relevant for this assessment. L_{Aeq} noise was dominated by traffic and suburban noise rather than industrial noise.

Table 5-1: Measured RBL and $L_{Aeq, period}$ Values

Location	RBL (dBA)			$L_{Aeq, period}$ (dBA)		
	Day	Evening	Night	Day	Evening	Night
RES1	47	44	40	55	55	49

5.4 Operational Noise Criteria

The NSW EPA have released a draft Industrial Noise Guideline aimed at superseding the INP. In relation to the proposed development, the proposed changes to the guideline would not have a material effect on the assessment outcomes. For this reason, the assessment has followed the procedures of the INP.

The INP seeks to control noise from newly introduced industrial noise sources by means of its "intrusiveness" and "amenity" noise criteria.

The "intrusiveness" criterion requires that the $L_{Aeq,15min}$ noise level from any new source should not exceed the existing Rating Background Level (RBL) for that period by more than 5dBA. Intrusiveness criterion values for potentially affected residences follow directly from the RBL values in **Table 5-1**.

These criteria apply to $L_{Aeq,15min}$ noise levels measured under specific meteorological conditions, determined as outlined in the INP. In general, however, it has been accepted that an appropriate, and conservative, assessment procedure is to compare the intrusiveness criterion with the $L_{Aeq,15min}$ noise level which is exceeded for 10% of 15-minute periods during any season. This procedure has been adopted for this assessment. **Table 5-2** summarises the intrusive noise criteria.

Table 5-2: Intrusive Criteria (dBA)

Location	Intrusive Criterion		
	Day	Evening	Night
RES1 - 15 Maugham Crescent	52	49	45

The "amenity" criterion applies to the $L_{Aeq,period}$ noise level due to all industrial sources affecting a location. It sets an upper limit to the total noise level ($L_{Aeq,period}$) in an area from all industrial noise (existing and future). The criterion depends on the time of the day, area classifications and the relationship of the total measured L_{Aeq} (and contribution from existing industrial noise) to determine the Acceptable Noise Level (**ANL**) for the development.

The potentially-affected areas are classified as "Suburban" by the INP. Given this, the Acceptable and Maximum Amenity levels ($L_{Aeq,period}$) which apply over the whole day, evening and night period are as shown in **Table 5-3**.

Table 5-3: Amenity Criteria (dBA)

Location	Amenity Criterion		
	Day	Evening	Night
Suburban	55-60	45-50	40-45
Active Recreation	55-60		
Industrial	70-75		

Allowing for the different time periods for assessing intrusiveness and amenity, it is considered achieving the following intrusive noise limits over a typical busy 15-minute period will also ensure compliance with the recommended acceptable amenity noise limits.

Table 5-4: Summary of Noise Criteria (dBA)

Location	Assessment Parameter	Criterion (dBA)		
		Day	Evening	Night
RES1 - 15 Maugham Crescent	$L_{Aeq,15min}$	52	48	43
Active Recreation	$L_{Aeq,period}$	55-60		
Industrial	$L_{Aeq,period}$	70-75		

For other residential areas which are all located closer to roads than Maugham Crescent, the criteria for RES1 are conservatively adopted.

5.5 Prediction of Operational Noise Levels

The Wilkinson Murray Report (**Appendix 15**) details the predicted impact of the proposed development as follows.

5.5.1 Meteorological Conditions

The INP requires that, in predicting operational noise levels, wind speed and direction should be taken into account if wind speeds of up to 3m/s in the source to receiver direction occur more than 30% of the time in any season.

Records of wind speed and direction were obtained from the Bureau of Meteorology monitoring station at the Horsley Park Equestrian Centre, approximately 5km south-west of the Site, for the 2012 calendar year. These data were analysed to identify any gradient winds.

The EPA's Noise Enhancement Wind Analysis (**NEWA**) software was used to identify instances of seasonal winds blowing from the source to any sensitive receivers for more than 30% of the time during the day, evening or night time assessment periods.

The NEWA software indicated that gradient winds exist during the night time period in winter for receivers to the east of the Site. No gradient winds where identified for receivers to the south or south-east of the Site.

5.5.2 Prediction Methodology

Table 5-1 of the Wilkinson Murray Report shows all equipment included in noise modelling, and the assumed Sound Power Levels. For activities which do not occur continuously over a 15-minute period, the L_{Aeq} is adjusted to account for the duration over which it occurs in any 15-minute period.

The dominant noise will be generated internally within the main manufacturing facility by the fixed plant as well as mobile plant including front end loaders, excavators and tipping of materials from trucks, or activities in the workshop building which will include intermittent grinding, welding and use of rattle guns. The manufacturing facility building will have thermal insulation on the underside of the roof which will control reverberation times.

Externally, noise will be dominated by trucks arriving and departing as well as intermittent fork lift movements to manage the bale stockpile. There will also be noise associated with air-conditioning plant for the office building.

To Residences

Whilst rapid roller doors are proposed and over a whole day a door would be open one third of the time, it is assumed as a worst-case scenario during a busy 15-minute period that one door on the western facade will remain open the whole time.

Given the distances to the nearest noise-sensitive receivers are in excess of 800 metres, and there is shielding by surrounding buildings in all directions, noise levels have been predicted based on geometric spreading and a conservative allowance of 10dB in relation to shielding from buildings. When considering adverse meteorological conditions, the effects of shielding is reduced to 5dB.

To Industrial Boundary and Active Recreation Area

For these assessment locations, assessed over the whole day, evening or night period, a roller door on the western facade is assumed to be open 1/3 of the time and all truck movements are assumed to occur in the daytime.

Whilst a 1.8 metre fence is proposed along part of the western boundary, it is not allowed for shielding provided calculations to the industrial boundary as it is not required in order to satisfy noise criteria.

Table 5-2 of the Wilkinson Murray Report (reproduced below) indicates the operational noise levels predicted at potentially affected residences, for the case where all equipment is working, and for acoustically neutral and adverse meteorological conditions, although the adverse conditions only need to be considered at RES 2 for night time. Calculations include the effect of shielding by intervening buildings.

Table 5-2 Predicted L_{Aeq} Operational Noise Levels, dBA

Receiver No.	Operational Noise Criterion, $L_{Aeq,15min}$ (dBA) Day/Eve/Night	Predicted Daytime Operational Noise Level $L_{Aeq,15min}$ (dBA)	
		Neutral Conditions	Adverse Conditions
RES1 – Maugham Cr	52/48/43	30	35
RES2 – Hassall St	52/48/43	24	29
RES3 – Galton St	52/48/43	28	33
RES4 – The Horsley Dr	52/48/43	27	32
Active recreation	55-60 $L_{Aeq,period}$	26	31
Industrial Boundary	70-75 $L_{Aeq,period}$	69	-

The predicted noise levels meet the relevant criteria at all assessment locations for both adverse and neutral conditions. This is based on comparing the typical worst case daytime operations with criteria for all periods even though night time operations are likely to generate much lower noise levels.

5.6 Traffic Noise

Truck movements would primarily occur during the 6:00 am to 6:00 pm period, however, 24-hour access to the Site is proposed.

A typical day would have staff associated with the processing of materials arriving from approximately 5:00 am as it is possible some waste will also arrive after 5:00 am.

The bulk of the waste will arrive between 6:00 am and 5:00 pm.

Product out will also primarily occur between 6:00 am and 6:00 pm, but some product will be dispatched during the evening up until 10:00 pm and it is possible there may be 1 or 2 semi-trailer movements during the night to dispatch PEF, subject to customer needs.

The processing plant will operate on a 2 shift basis, one commencing at 6:00 am and finishing at approximately 2:00 pm and the next until 10:00 pm.

Similarly, office staff will primarily work normal business hours (7:00 am - 5:00 pm). Light vehicle movements associated with these staff are included in the assessment.

5.6.1 Noise Criteria

For existing residences affected by additional traffic on existing freeways / arterial roads generated by land use developments, the appropriate noise assessment criteria are set in the Road Noise Policy (**RNP**).

The appropriate daytime assessment criterion is $L_{Aeq,15hr}$ 60dBA at 1 metre in front of the facade. The night time criterion is $L_{Aeq,9hr}$ 55dBA. Where existing traffic noise levels already exceed these noise levels, the RNP deems an increase of up to 2dB represents a minor impact which is considered barely perceptible to the average person.

Trucks will access via Frank Street from either the east or west and then typically via Redfern Street / Hassall Street or Elizabeth Street and then The Horsley Drive or Gipps Road, dependent on size and RMS requirements.

The nearest residences / noise sensitive receivers to the facility, likely to be affected by additional traffic are located on Hassall Street south of Gipps Road or along The Horsley Drive.

In accordance with the definitions outlined in the RNP all these roads would be classified as arterial.

5.6.2 Prediction of Traffic Noise Levels

A traffic study has been prepared by Lyle Marshall & Associates Pty Ltd which predicted future traffic generation by the recycling facility based upon processing 250,000 tonnes of raw materials per annum. The assessment was based upon 250 working days Monday to Friday and 52 Saturdays per annum (302 days) for waste deliveries to the Site and 250 days for product out and average truck loads.

The number of additional vehicles based on annual average is summarised in Table 6-3 of the Wilkinson Murray Report, which is reproduced below.

Table 6-3 Summary of Estimated Number of Daily Truck Movements

Location	Day (7am-10pm)		Night (10pm-7am)	
	Cars	Trucks	Cars	Trucks
Frank St (east of site)	46	147	20	9
Frank St (west of site)	35	233	17	15
Hassall St (south of Gipps Rd)	22	107	10	7
The Horsley Dr (east of Hassall St)	22	107	10	7
The Horsley Dr (west of Elizabeth St)	35	233	17	15

Existing traffic volumes are summarised in Table 6-4 of the Wilkinson Murray Report which is reproduced below.

Table 6-4 Summary of Estimated Number of Daily Truck Movements

Location	Day (7am-10pm)		Night (10pm-7am)	
	Volume	%HV	Volume	%HV
Frank St (east of site)	3623	35.7	830	22.5
Frank St (west of site)	3623	35.7	830	22.5
Hassall St (south of Gipps Rd)	19548	20 est	4467	-
The Horsley Dr (east of Hassall St)	18230	20 est	4165	-
The Horsley Dr (west of Elizabeth St)	18530	20 est	4240	-

Given the existing high traffic volumes on all the roads where residences are located, existing noise levels are likely to exceed the RNP base criterion. The increased noise level due to traffic from the proposed recycling facility is calculated to be 0.2dB at daytime and less than 0.1dB at night time. This is significantly below the 2dB increase which is described as noticeable and negligible impact is therefore expected.

5.7 Construction Noise

5.7.1 Noise Criteria for Construction Activities

The NSW Interim Construction Noise Guideline (**ICNG**) presents the process to assess construction noise in NSW.

The ICNG was developed by the then Department of Environment Climate Change &

Water taking into consideration that construction is temporary, noisy and difficult to ameliorate. As such, the ICNG was developed to focus on applying a range of work practices most suited to minimising construction noise impacts, rather than focusing only on achieving a numeric noise level.

The ICNG recommends that standard construction work hours should typically be as follows:

- Monday to Friday 7:00 am to 6:00 pm
- Saturday 8:00 am to 1:00 pm
- No work on Sundays or public holiday.

Additionally, the ICNG recommends quantitative management noise goals at residences as presented in Table 7-1 of the Wilkinson Murray Report.

The ICNG presents the following noise management levels for non-residential premises:

- Active recreation areas external $_{LAeq\ (15\ min)}$ 65dBA
- Industrial premises external $L_{Aeq\ (15\ min)}$ 75dBA

The construction noise management levels at all the existing residences are shown in **Table 5-5**. **Table 5-5** also shows the management levels at other receivers.

Table 5-5: Construction Noise Criteria for Daytime Construction

Location	Construction Noise Management Levels L_{Aeq} (dBA)
Residences RES 1-4	56
Active Recreation	65
Industrial	75

5.7.2 Predicted Construction Noise Levels

Earthworks will generate the highest noise levels. There will need to be construction of retaining walls (the highest in the north west corner), import of select material, plus the spreading and compaction. This will be followed by drainage works and then paving.

The final stage will be the construction of buildings followed by fit out.

Construction plant assumed to be required for these works, and the total L_{Aeq} Sound Power Level for are presented in Table 7-3 of the Wilkinson Murray Report which is reproduced below.

Table 7-3 Construction Plant Total Sound Power Level (SWL)

Activity	Typical Equipment Used	Total $L_{Aeq,15min}$ Sound Power Level (dBA)
Earthworks / Drainage / Pavement	Dozer, Front End Loader, Roller, Excavator and Truck	115
Retaining Walls	Piling Rig / Concrete trucks	112
Buildings and Fit out	Cranes, Delivery Trucks and Power Tools	110

Table 7-4 of the Wilkinson Murray Report reproduced below shows the predicted construction noise levels for the main phases.

Table 7-4 Predicted Noise Levels from Construction

Receiver No.	Construction Noise Management Level, $L_{Aeq,15min}$ (dBA)	Predicted Construction Noise Level $L_{Aeq,15min}$ (dBA)		
		Site Earthworks	Retaining Walls	Site Buildings
RES1 – Maugham Cr	58	39	39	34
RES2 – Hassall St	58	34	34	29
RES3 – Galton St	58	36	36	31
RES4 – The Horsley Dr	58	35	35	30
Active recreation	65	34	34	29
Industrial Boundary	75	70-81	70-90	70-76

Predicted noise levels at residences and the active recreation area are expected to comply with the Management Levels. Negligible impact is expected.

There will be exceedance of construction Noise Management Levels at the industrial boundaries from time to time when construction plant is located close to the boundary. In particular, this would relate to the western boundary near the north western corner of the Site where the larger retaining walls and extensive fill is required. This is common across many construction sites.

Inspection of aerial photography indicates the boundary areas of the adjoining sites include some buffer area and are currently used for truck trailer parking or car parking, hence, negligible impact is expected during these noisier construction periods.

Part Six

AIR QUALITY IMPACT ASSESSMENT

6.1 Introduction

The Secretary's Environmental Assessment Requirements includes a requirement for:

- *a quantitative assessment of the potential air quality, dust and odour impacts of the project on surrounding landowners in accordance with relevant EPA guidelines;*

- *the likely emissions from the manufacturing process and a description of the mechanical extraction system and method of treatment;*

- *a description of the building's mechanical ventilation and doors or other structures that effectively contain emissions;*

- *details of proposed mitigation, management and monitoring measures.*

In order to ascertain the potential impact of the proposed development on the air quality of the locality, Wilkinson Murray has prepared a report titled *Waste and resource Management Facility. Air Quality Impact Assessment* (**the Wilkinson Murray Report**) a copy of which is at **Appendix 14**.

6.2 Surrounding Land Use and Sensitive Receptors

The land use immediately surrounding the Site is industrial. The nearest sensitive receptors are the residences in Wetherill Park, located more than 700 metres away.

A number of residential receptor 'catchments' have been defined to identify receivers to the east, south-east, south and south-west.

Table 2-1, of the Wilkinson Murray Report which is reproduced below, presents each catchment, and identifies the most affected discrete receptor in each catchment, which will be used for the purposes of dispersion modelling and assessment of potential impacts.

Table 2-1 Sensitive Receptors

Catchment	Most Affected Receptor				
	Address	Easting (m)	Northing (m)	Distance from Site	Elevation (m)
R1	15 Maugham Crescent	306488	6252687	730	53
R2	54 Eyre Street	307879	6253087	1,410	32
R3	160 Chifley Street	307467	6252917	1,080	32
R4	6 Cobbett Street	306163	6252516	955	63

Figure 6-1 shows the location of the sensitive receivers and the 'catchments' R1, R2, R3 and R4.

Figure 6-1: Sensitive Receivers and 'catchment' R1, R2, R3 and R4.

6.3 Air Quality Criteria

The NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2005) sets out applicable impact assessment criteria for a number of air pollutants.

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The sections below identify the pollutants of interest in this study and the application of air quality criteria for each pollutant.

6.3.1 Pollutants of Interest

Potential pollutants identified for this development with the potential to result in air quality impacts include odour and dust.

Putrescible waste is not accepted on the Site, however, it is foreseeable that a customer may deliver a load which contains some putrescible waste, and that it would spend a small amount of time on Site before it is rejected and removed.

C&D and C&I waste contain a significant percentage of dusty materials, such as bricks, concrete and sand. The handling of these materials, and the shredding of combustible materials, will produce dust and particulate matter.

6.3.2 Impact Assessment Criteria

Odour

NSW legislation prohibits emissions which cause offensive odour to occur at any off-site receptor. Offensive odour is evaluated in the field by authorised officers, who are obliged to consider the odour in the context of its receiving environment, frequency, duration, character and so on and to determine whether the odour would unreasonably interfere with the comfort and repose of the normal person. In this context, the concept of offensive odour is applied to operational facilities and relates to actual emissions in the air.

In the approval and planning process for proposed new operations, or modifications to existing projects, no actual odour exists and it is necessary to consider hypothetical odour. In this context, odour concentrations are used and are defined in odour units. The number of odour units represents the number of times that the odour would need to be diluted to reach a level that is just detectable to the human nose. By definition, odour less than one odour unit (1 OU), would not be detectable to most people.

The range of a person's ability to detect odour varies greatly in the population, as does their sensitivity to the type of odour, therefore, there can be a wide range of variability in the way odour response is interpreted.

It should be noted that odour refers to complex mixtures of odours, and not 'pure' odour arising from a single chemical. Odour from a single, known chemical very rarely occurs (when it does, it is best to consider that specific chemical in terms of its concentration in the air). In most situations, odour will be comprised of a cocktail of many substances which is referred to as a complex mixture of odorous pollutants, or more simply odour.

For developments with potential for odour, it may be necessary to predict the likely odour impact which may arise. This is done by using air dispersion modelling which can calculate the level of dilution of odours emitted from the source at the point which it reaches surrounding receptors. This approach allows the air dispersion model to produce results in terms of odour units.

The NSW criteria for acceptable levels of odour range from 2 to 7 OU, with the more stringent 2 OU criteria applicable to densely populated urban areas and the 7 OU criteria applicable to sparsely populated rural areas.

The sensitive receivers identified in this assessment are located in an urban setting, and, therefore, an impact assessment criterion of 2.0 OU/m^3 has been adopted.

Dust and Particulate Matter

The EPA Approved Methods specifies air quality assessment criteria for assessing impacts from dust generating activities. These criteria are consistent with the National Environment Protection Measures for Ambient Air Quality (NEPC, 1998).

Table 3-2 of the Wilkinson Murray Report, which is reproduced below, summarises the air quality goals for dust and particulate matter which are relevant to this assessment. The air quality goals relate to the total concentrations of dust and particulate matter in the air and not just that from the proposed development. Some consideration of background levels needs to be made when using these goals to assess impacts.

Table 3-2 Impact assessment criteria – dust and particulate matter

Pollutant	Averaging period	Impact	Criteria
Total suspended particulates (TSP)	Annual	Total	90 $\mu g/m^3$
Particulate matter ≤10 µm (PM_{10})	Annual	Total	30 $\mu g/m^3$
	24-hour	Total	50 $\mu g/m^3$
Deposited dust (DD)	Annual	Total	4 g/m^2/month
	Annual	Incremental	2 g/m^2/month

There are currently no air quality goals for particulate matter ≤ 2.5 µm ($PM_{2.5}$) for projects within NSW, however, the National Environmental Protection Council (**NEPC**) has developed an advisory National Environmental Protection Measure (**NEPM**) for $PM_{2.5}$, as follows:

- A maximum 24 hour average concentration of 25 $\mu g/m^3$ and,
- An annual average concentration of 8 $\mu g/m^3$.

The above goals for $PM_{2.5}$ concentrations are considered advisory only.

6.4 The Existing Environment

6.4.1 Local Climate

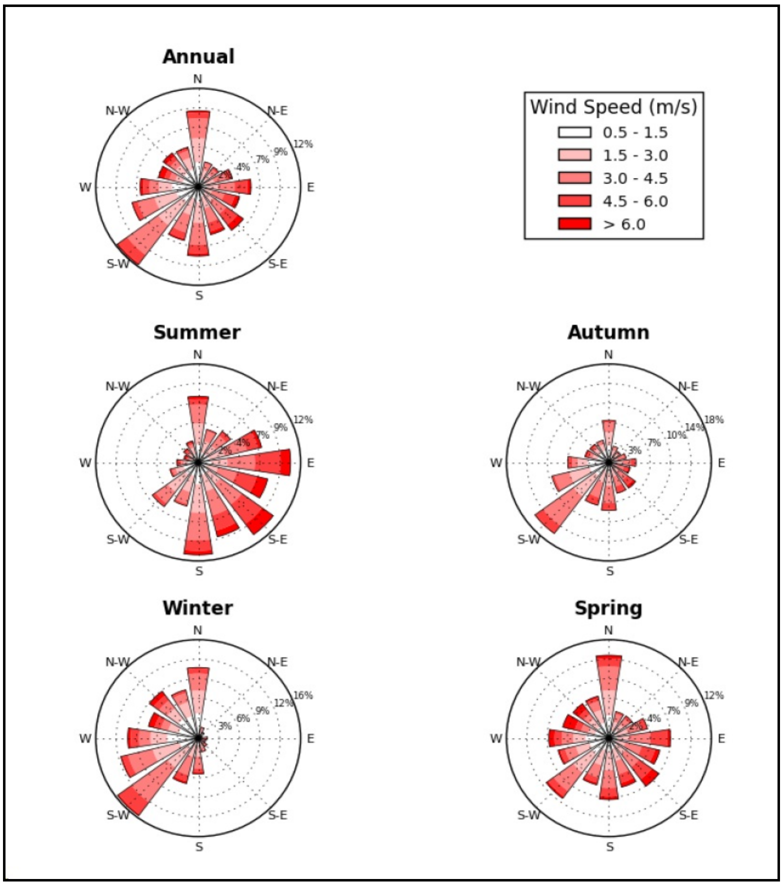
Long term meteorological data for the area surrounding the Site is available from the Bureau of Meteorology (**BOM**) operated Automatic Weather Station (**AWS**) at the Horsley Park Equestrian Centre. The Horsley Park Equestrian Centre AWS is located approximately 5 kilometres south west of the Site and records observations of a number of meteorological data including temperature, humidity, rainfall, wind speed and wind direction.

Long-term climate statistics are presented in Table 4-1 of the Wilkinson Murray Report, which is reproduced below. Temperature data recorded at the Horsley Park Equestrian Centre AWS indicate that January is the hottest month of the year, with a mean daily maximum temperature of 29.8°C. July is the coolest month with a mean daily minimum temperature of 5.8°C. February is the wettest month with an average rainfall of 112 mm falling over almost 8 days. There are on average 77 rain days per year, delivering 770 mm of rain.

Table 4-1 Long-term climate averages – Horsley Park Equestrian Centre AWS

Observation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
9am Mean Observations													
Temperature (°C)	22.0	21.5	19.4	17.5	13.8	11.1	10.3	12.0	15.6	18.1	19.2	20.9	16.8
Humidity (%)	73	77	81	76	77	80	78	70	65	61	70	71	73
3pm Mean Observations													
Temperature (°C)	28.2	27.1	25.3	22.2	19.2	16.6	16.1	17.8	20.8	22.5	24.2	26.5	22.2
Humidity (%)	49	53	54	53	52	55	50	42	42	45	50	48	49
Daily Minimum and Maximum Temperatures													
Minimum (°C)	17.7	17.8	15.9	12.8	9.0	7.1	5.8	6.5	9.4	11.6	14.4	16.1	12.0
Maximum (°C)	29.8	28.6	26.7	23.5	20.3	17.6	17.2	19.1	22.5	24.6	26.3	28.0	23.7
Rainfall													
Rainfall (mm)	71.1	111.7	74.3	81.8	48.7	65.4	38.3	38.6	34.9	57.5	82.9	65.1	770.2
Rain days	7.7	7.4	7.5	7.7	5.6	6.3	5.5	4.4	4.9	5.7	7.3	7.1	77.1

Windrose plots showing the distribution of wind direction and wind speed at the Horsley Park Equestrian Centre AWS between 2009 and 2014 are presented in Figure 4-1 of the Wilkinson Murray Report which is reproduced below.



6.4.2 Local Ambient Air Quality

Odour

No significant sources of odour have been identified in the vicinity of sensitive receptors considered in this assessment.

Dust and Particulate Matter

Air Quality monitoring data from the Office of Environment and Heritage (**OEH**) air quality monitoring site at Prospect has been used to characterise the ambient air quality in the area surrounding the Site.

The OEH's Prospect site is located approximately 5 kilometres north of the Site. A summary of the PM_{10} monitoring results from 2012 to 2014 collected at the Prospect monitoring site is presented in Table 4-2 of the Wilkinson Murray Report which is reproduced below.

Table 4-2 PM_{10} Monitoring Results – Prospect

Year	Annual Average (µg/m3)	24 Hour Average (µg/m³)	
		Maximum	90th Percentile
2012	17.2	38.7	26.4
2013	19.2	81.8	29.9
2014	17.6	44.3	25.6

The above table indicates that ambient PM_{10} concentrations in the area surrounding the Site are generally below recommended limit of 50 µg/m³. Serious bushfires in the Blue Mountains during October 2013 resulted in a number of days where ambient PM_{10} concentrations were significantly elevated.

There are no readily available site specific Total Suspended Particle (**TSP**) and deposited dust monitoring data. The Prospect monitoring site does not measure these components, however, estimates of the background levels for the area are required to assess the impacts.

Estimates of the annual average background TSP concentrations can be determined from a relationship between measured PM_{10} concentrations. This relationship assumes that 40% of the TSP is PM_{10} and was established as part of a review of ambient monitoring data collected by co-located TSP and PM_{10} monitors operated for reasonably long periods of time in the Hunter Valley.

Applying this relationship with the 2012 annual average PM_{10} concentration of 17.2 µg/m³ at the Prospect monitoring station estimates an annual average TSP concentration of 43.0 µg/m³.

To estimate annual average dust deposition levels, a similar process to the method used to estimate TSP concentrations is applied. This approach assumes that a TSP concentration of 90µg/m³ will have an equivalent dust deposition value of 4 g/m²/month, and indicates a background annual average dust deposition of 1.4 g/m²/month for the area surrounding the Site.

The OEH monitoring site in Prospect began to record ambient concentrations of $PM_{2.5}$ in December 2014. Table 4-3 of the Wilkinson Murray report which is reproduced below presents a summary of these data between December 2014 and 15 October 2015.

Table 4-3 $PM_{2.5}$ Monitoring Results – Prospect

Year	Annual Average (µg/m3)	24 Hour Average (µg/m³)	
		Maximum	90th Percentile
2014/15	8.4	29.6	13.8

It should be noted that the annual average and maximum 24 hour average $PM_{2.5}$

concentrations measured at the Prospect OEH monitoring site exceed the NEPM advisory goals. There is one exceedance of the 24-hour average NEPM goal for $PM_{2.5}$ during 2015. This occurred during June, and is most likely the result of wood heaters being used in nearby residential areas.

For the purposes of assessing total $PM_{2.5}$ levels resulting from the proposed development, the second highest 24-hour average observation of 24.9 $\mu g/m^3$ will be used to represent the background level. This facilitates the identification of any additional exceedances of the NEPM goal.

6.5 Meteorological Modelling

The Air Pollution Model

No meteorological observation data is available for the Site. The Horsley Park Equestrian Centre AWS is located approximately 5 kilometres south west of the Site, therefore, site-specific meteorological data was generated through the use of a prognostic model. The prognostic model used was The Air Pollution Model (**TAPM**), developed and distributed by the Commonwealth Scientific and Industrial Research Organisation (**CSIRO**).

TAPM is an incompressible, non-hydrostatic, primitive equations prognostic model with a terrain-following vertical coordinate for three-dimensional simulations. It predicts the flows important to local scale air pollution, such as sea breezes and terrain induced flows, against a background of large scale meteorology provided by synoptic analyses. TAPM benefits from having access to databases of terrain, vegetation and soil type, leaf area index, sea-surface temperature, and synoptic scale meteorological analyses for various regions around the world.

The prognostic modelling domain was centred at 33.84° S, 150.91° E and involved four nesting grids of 30km, 10 km, 3 km and 1km with 25 grids in the lateral dimensions and 25 vertical levels.

The TAPM model included assimilation of data collected at the Horsley Park Equestrian Centre AWS during the year 2012. This modelling year was chosen based on a long term meteorological analysis.

CALMET

The three dimensional prognostic wind field from the TAPM simulation was incorporated in a CALMET model as the initial guess wind field. CALMET was run using the "No-Observations Approach" recommended by TRC (2011).

The CALMET domain was 6 x 6 km with a grid resolution of 0.15 km. Local land use and topographical data (SRTM 3) were used to produce realistic fine scale flow fields in the area surrounding the Site.

Dispersion Modelling

CALPUFF is a non-steady state Gaussian puff dispersion model, developed for the US EPA and approved for use in DEC (2005). CALPUFF is considered an advanced dispersion model and is intended for use in situations where less advanced Gaussian plume models are not appropriate. CALPUFF is most often used in areas exhibiting one or more of the following features:

- Complex terrain;
- Recirculating coastal sea breezes;
- High frequency of calm winds, and
- Buoyant line sources.

CALPUFF is also the preferred dispersion model for odour, and for this reason has been selected for this assessment.

Peak to Mean Ratios

To account for the time-averaging limitations of the dispersion model, peak-to-mean ratios have been incorporated into all odour flux rates in accordance with the Approved Methods.

Building Wake Effects

All emissions associated with the proposed development were modelled using volume sources, which are not affected by building wakes.

Dust Particle Size Distribution

Dust deposition is strongly influence by particle size, therefore, the total dust emissions from the Site are separated into three fractions, based on particle size, as presented in Table 5-2 of the Wilkinson Murray Report which is reproduced below.

Table 5-2 Dust Particle Size Distribution

Particle Category	Size Range	Distribution (% of TSP)
Fine Particles (FP)	<2.5 µg	4.68%
Coarse Matter (CM)	2.5 – 10 µg	34.4%
Rest	10 – 30 µg	60.92

Each fraction is modelled as a separate species in CALPUFF, and the predicted ground level concentrations of $PM_{2.5}$, PM_{10}, TSP and dust deposition levels are calculated as combinations of the relevant fractions.

6.6 Emissions to Air

6.6.1 Odour Emissions

No significant odour sources have been identified for the normal operations of the facility, however, it is foreseeable that a customer may deliver a load which contains some putrescible waste, and that it would spend a small amount of time on Site before it is rejected and removed. A partial load of putrescible waste would spend no more than 1 - 2 hours on the Site.

A specific odour emission rate (**SOER**) of 3.65 OU.m^3/s^2/s has been used to represent the likely odour emissions from putrescible waste on the tipping floor. This value is adopted from an assessment of putrescible waste in a resource recovery facility in Newcastle (PAE Holmes, 2011). It is assumed that a partial load of putrescible waste would cover no more than 100m^2 of the tipping floor.

A summary of the estimate odour emissions from the tipping floor are presented in Table 6-1 of the Wilkinson Murray Report which is reproduced below.

Table 6-1 Odour Emission Estimate

Source	SOER (OU.m^3/m^2/s)	Area (m^2)	Odour flux rate	Peak to mean ratio	Peak odour flux rate
Tipping Floor	3.65	100	365	2.3	840

6.6.2 Dust Emissions

Dust emissions during operation of the facility have been estimated based on information provided by ResourceCo, using emission factors sourced from both locally developed and US EPA developed documentation.

Dust would be generated during site operations due to the handling and processing of materials, and from truck movements on paved roads.

The majority of the PEF production process involves separating the incoming waste, by size and weight, to extract materials with sufficient calorific value. Aggregate materials, such as bricks and concrete, are quickly removed and are, therefore, not handled as many times as the combustible materials which are included in PEF.

Over the duration of the production process, aggregate materials are handled approximately 5 times, whereas combustible materials are handled approximately 10 times.

Since the PEF production takes place inside a building with dust suppression sprinklers, it is assumed that dust emissions are reduced by 50%. Although roadways would be kept clean, no reduction has been applied to the dust emissions from truck movements.

Total dust emissions from all significant dust generating activities during site operations are presented in Table 6-2 of the Wilkinson Murray Report which is reproduced below.

Table 6-2 Estimated Annual TSP Emissions

Activity	TSP Emissions (kg/year)
Truck movements on paved roads	2,480
Handling aggregate materials	21
Handling combustible/PEF materials	<1
Shredding PEF materials	135
Total	**2,636**

Detailed emission inventory and emission estimation calculations are presented in Appendix B of the Wilkinson Murray Report.

6.7 Assessment of Impacts

The following section presents quantitative assessments of the potential odour and dust impacts on nearby sensitive receptors from the operation the facility.

6.7.1 Assessment of Operational Odour Impacts

Based on dispersion modelling results, the predicted operational odour impacts on nearby receptors is presented numerically in Table 7-1 of the Wilkinson Murray Report which is reproduced below and graphically via contours in **Figure 6-1**.

Table 7-1 Predicted 99th percentile peak odour concentrations

Receptor	Predicted peak odour concentration (OU/m^3)	Impact assessment criterion (OU/m^3)	Complies? (Yes/ No)
R1	<0.1	2.0	Yes
R2	<0.1	2.0	Yes
R3	<0.1	2.0	Yes
R4	<0.1	2.0	Yes

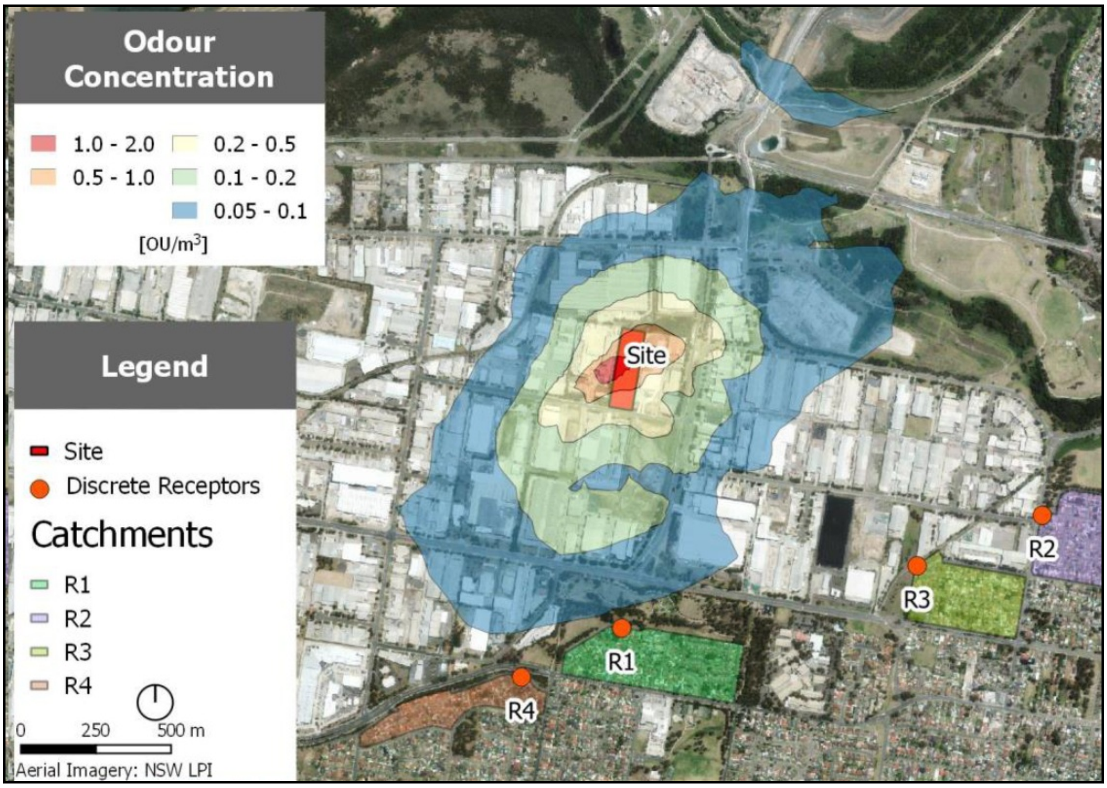


Figure 6-1: Predicted 99th percentile peak odour concentrations.

The predicted 99th percentile odour concentrations comply with the established criterion of 2.0 OU/m^3. The 1.0 OU/m^3 contour does not include any sensitive receptors, indicating that peak odour emissions from the Site would not be detectable.

6.7.2 Assessment of Operational Dust Impacts

Table 7-2 of the Wilkinson Murray Report which is reproduced below presents the dispersion modelling results for criteria dust and particulate matter pollutants at sensitive receptors. Review of Table 7-2 demonstrates that dust and particulate matter emissions from the facility have a negligible contribution to air quality at nearby sensitive residential receptors. The impact assessment criteria are met at all receptors for TSP. PM_{10} and deposited dust.

Table 7-2 Predicted Criteria Dust Impacts at Discrete Receptors

Receptor	TSP		PM_{10}				Dust Deposition	
	Annual Average		24-hour Average		Annual Average		Annual Average	
	Increment	Total	Increment	Total	Increment	Total	Increment	Total
Goal	**90 µg/m³**		**50 µg/m³**		**30 µg/m³**		**2 g/m²/month**	**4 g/m²/month**
R1	0.19	43.19	0.67	39.37	0.09	17.29	0.00	1.40
R2	0.03	43.03	0.18	38.88	0.02	17.22	0.00	1.40
R3	0.05	43.05	0.31	39.01	0.02	17.22	0.00	1.40
R4	0.15	43.15	0.53	39.23	0.08	17.28	0.00	1.40

A contour plot of the incremental 24 hour average PM_{10} concentrations is presented in **Figure 6-2**.

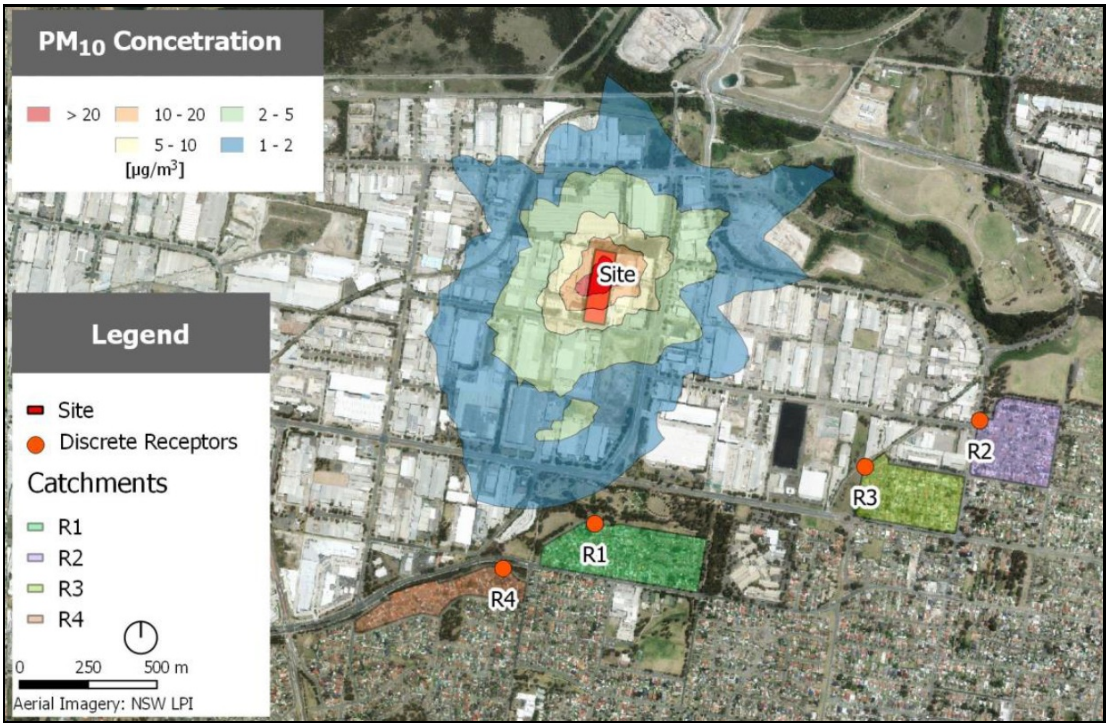


Figure 6-2: Predicted Incremental 24-hour Average PM_{10} Concentration.

Table 7-3 of the Wilkinson Murray Report which is reproduced below presents the dispersion modelling results for $PM_{2.5}$ at discrete receptors. Review of Table 7-3 indicates that the facility is unlikely to generate additional exceedances of the 24-hour average NEPM goal for $PM_{2.5}$. The existing ambient annual average concentrations of $PM_{2.5}$ are slightly above the NEPM goal, and the facility has a negligible contribution to these concentrations.

Table 7-3 Predicted $PM_{2.5}$ Impacts at Discrete Receptors

Receptor	$PM_{2.5}$			
	24-hour Average		Annual Average	
	Increment	Total	Increment	Total
Goal	**25 μg/m³**		**8 μg/m³**	
R1	0.08	24.98	0.01	8.41
R2	0.02	24.92	0.00	8.40
R3	0.04	24.94	0.00	8.40
R4	0.07	24.97	0.01	8.41

The air quality impact assessment has demonstrated that the facility is expected to comply with relevant air quality criteria. Notwithstanding, responsible developments should implement reasonable and feasible measures to reduce their burden on local and regional air quality. To this end, the following section presents a number of measures to reduce odour and dust emissions from the Site.

Odour Management

Any incoming loads containing odorous materials will be identified immediately and rejected from the Site. Additionally, the following odour management measures should be considered during the operation of the facility:

- Procedures for staff to report the presence of odours, and
- Maintaining an odour complaints register which captures any complaints from off-site receptors.

Dust Management

The main building will be fitted with dust suppression sprinklers and automatic roller doors. In addition, the following dust management measures should be considered during the operation of the facility:

- Engines of trucks and mobile plant to be switched off when not in use;
- Maintain and service plant in accordance with manufacturer's specifications;
- Sweep trafficable areas at least once daily;
- Limit vehicle speeds to 20 km/h;
- Cover vehicle loads if transporting material off-site, and
- Reduce drop heights during loading and unloading of material.

Part Seven

GREENHOUSE GAS ASSESSMENT

7.1 Introduction

The Secretary's Environmental Assessment Requirements includes a requirement for:

> *... a greenhouse gas assessment.*

In order to ascertain the potential impact of the proposed facility on Greenhouse Gas Emissions, Wilkinson Murray has prepared a report titled Waste and Recourse Management Facility. Greenhouse Gas Assessment (**the Wilkinson Murray Report**), a copy of which is at **Appendix 16**.

The Greenhouse Gas Assessment has been prepared in accordance with the following documents:

- *Technical Guidelines for the Estimation of Greenhouse Gas Emissions by Facilities in Australia* (DoE, 2014), and
- *National Greenhouse Accounts Factors* (DoE, 2015).

7.2 Methodology

The following greenhouse gases have been identified as significant contributors to global warming:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Synthetic gases, and
- Hydro fluorocarbons HFCs, SF_6, CF_4, $C2F_6$.

No significant emissions of HFCs and synthetic gases are likely to occur as a result of the construction or operation of the project and have, therefore, been omitted from the remainder of the assessment.

Under the Department of Climate Change and Energy Efficiency protocol, Green House Gas (**GHG**) emissions are categorized as Scope 1, Scope 2 and Scope 3 emissions which are defined as follows:

- **Scope 1 - Direct (or point-source) emissions** - emissions from sources owned or operated by the facility. These may be calculated using 'Point Source Emissions Factors' as defined in the AGO Factors and Methods Workbook.

- **Scope 2 - Indirect emissions** - emissions released as a result of the generation of electricity, or the production of heat, cooling or steam purchased by the reporting company.

- **Scope 3 - Various emissions** - all other GHG emissions which are not covered under Scope 1 or Scope 2. Scope 3 emissions can include activities such as employees commuting to work, extraction, production and transport of fuels, materials and other goods, and use of products manufactured and sold.

This GHG assessment considers the following GHG emissions and energy consumption activities associated with the proposed development:

Scope 1 - Direct Emissions

- Combustion of fuel in facility, stationary and mobile plant and equipment.

Scope 2 - Indirect Emissions

- Electricity generated off-site which is consumed on the Site.

7.2.1 Emission Factors

Based on the identified sources of GHG emissions from the proposed development, relevant emission factors have been adopted from the National Greenhouse Accounts Factors, August 2015.

Table 7-1 presents the Scope 1 emissions factors used in this assessment.

Table 7-1: Scope 1 Emission Factors (Transport Fuels)

Fuel Type	Energy Content (GJ/kL)	Emission Factor (kg CO_{2-e}/GJ)		
		CO_2	CH_4	N_2O
Diesel Oil	38.6	69.9	0.1	1.8

Scope 2 emissions have been calculated using an emission factor of 0.86 (kg CO_{2-e}/kWh), applicable to electricity produced in New South Wales.

7.3 Estimation of Greenhouse Gas Emissions

Greenhouse gas emissions associated with the construction and operation of the facility have been estimated based on information obtained from ResourceCo, and published emissions factors. The emissions estimates are based on the best available design data for the facility at the time of undertaken the assessment.

7.3.1 Construction Greenhouse Gas Emissions

The most significant greenhouse gas emissions from the construction of the facility would result from fuel combusting in mobile plant during the Bulk Earthworks phase.

The Bulk Earthworks phase would involve importing approximately 9,000m^3 of fill material over approximately 12 weeks.

The annual greenhouse gas emissions during the construction of the facility would be small compared to those during the operation of the facility. For this reason, a quantitative assessment of construction greenhouse gas emissions has not been undertaken.

7.3.2 Operational Greenhouse Gas Emissions

Greenhouse gas emissions associated with the operation of the facility will result from fuel combusted in mobile plant, and electricity used to power both the processing equipment and offices.

The following section presents an estimation of greenhouse gas emissions associated with the operation of the facility.

Fuel Consumption

ResourceCo estimates the total usage of diesel fuel for on-site mobile plant to be 30,000 litres per month.

Based on the emission factor for diesel transport fuel, the CO_{2-e} emissions associated with on-site fuel combustion are 1,197 tonnes per annum.

Electricity Use

ResourceCo estimates the total electricity usage for the Site to be 300,000 kWh per month. This accounts for electricity used in the processing facility and in office and administration areas.

Based on the emission factor for purchased electricity, the CO_{2-e} emissions associated with electricity use at the Site are 3,096 tonnes per annum.

The total operational GHG emissions for the facility are summarised in **Table 7-2**.

Table 7-1: Scope 1 Emission Factors (Transport Fuels)

Source	CO_{2-e} Emissions (tonnes)
Diesel	1,197
Electricity	3,096
Total	**4,293**

7.4 Overall Emissions

The total estimated annual greenhouse gas emissions during the construction and operation of the facility are 4,293 tCO2-e.

Australia's total greenhouse gas emissions in 2012/13 amounted to 549 million tonnes of carbon dioxide equivalent ($MtCO_{2-e}$) whilst New South Wales, in 2012/13, accounted for 142 Mt of the total, therefore, operation of the facility will account for approximately 0.003% of current NSW emissions.

7.5 Conclusion

The greenhouse gas assessment has identified sources of greenhouse gas emissions associated with the construction and operation of the facility, in accordance with the Secretary's Environmental Assessment Requirements.

Estimates of equivalent carbon dioxide have been predicted and it has been determined that the operation of the facility will account for approximately 0.003% of current NSW emissions.

Part Eight
VISUAL IMPACT ASSESSMENT

8.1 Introduction

The Secretary's Environmental Assessment Requirements includes a requirement for:

> *... an assessment of the potential visual impacts of the project on the amenity of the surrounding area.*

In order to ascertain the potential impact of the proposed development on the visual environment of the locality, a Visual Impact Assessment has been undertaken.

8.2 Methodology

The assessment of visual impacts is a field which requires a degree of subjective judgment and cannot be made fully objective.

It is necessary to limit the subjectivity of the work by adopting a systematic, explicit and comprehensive approach with the aim of separating aspects which can be more objective, for example the physical setting, visual character, visibility and visual qualities of a proposal, from more subjective elements, such as matters of personal taste and emotion.

The methodology utilised consists of the steps described below.

1. Identification and description of the existing visual character of the land within which the proposal would be seen.

2. Analysis and evaluation of the potential future visibility of and visual accessibility of the proposal.

3. Assessment of the residual visual impacts of the proposal, if any, and any necessary mitigation measures which are the subject of commitments to environmental management programs for which conditions of consent would be required.

A viewpoint analysis was conducted to assess the visual impacts which may be experienced which consisted of visiting the Site and the locality and assessing the likely impact on views from selected locations. The locations were selected to represent all of the types of view of the development which would exist in the immediate area. At each viewing place, a series of observations and assessments were made. A variety of locations were also visited to ascertain the extent of the visual catchment and the characteristics of the views.

The catchment from where the Site can be seen is limited due largely to the industrial nature of the locality. **Figure 8-1** shows the general catchment of the locality from where views of the Site might be obtained.

Figure 8-1: View shed to the Site shown as red shading with the Site shown as yellow shading.

8.3 The Existing Environment

The Site has been previously used by Sims Metal as a metal recycling facility. Apart from the disused buildings on the Site, the Site is vacant.

The land along the western boundary of the Site contains vegetation and a solid boundary fence.

At the northern end of the Site, the vegetation covers a large area between the Site and the adjoining land. The vegetation is located within an easement which runs along the northern boundary of the Site. Factory development and associated landscaping are contained on the land to the north of the easement.

To the south of the Site, there is a vacant parcel of land and also established factory and warehousing facilities.

Views from the surrounding area to the Site are restricted to a significant extent by retaining walls and fencing which have been established to make the adjoining sites more amenable to industrial development, however, there are some limited viewing opportunities into the interior of the Site.

To the west of the Site, is an extensive industrial complex operated by Border Express and associated car parking. Limited views to the Site would be obtained from this adjoining land due to the presence of a large factory/warehouse building on that site and the difference in elevation between that site and the Site. A boundary fence along the length of the Site also limits the view corridor from the adjoining land to the Site.

The land surface on which the proposed development would exist is not visible from any existing residential location outside the Site because of the distance and topographic relationships which exist between them and the Site.

A series of photographs demonstrating the existing development in the immediate locality of the Site are provided below.

Photograph 1: This photograph shows the fence along the western boundary of the Site. © GOOGLE

Photograph 2: This photograph is taken from Frank Street looking to the north east over the corner of the adjoining land to the west. The green boundary fence on the Site is seen in this photograph. © GOOGLE

Photograph 3: This photograph shows the entrance to the Border Express facility to the west of the Site. The car park for that facility is also visible. Glimpses to the proposed development would be obtained from this area. © GOOGLE

Photograph 4: This photograph shows the entrance to the Sleepmaker facility and the Border Express facility on the southern side of Frank Street and to the west of the Site. Glimpses of the proposed facility would be obtained from this area. © GOOGLE

Photograph 5: This photograph shows part of the car park at the Sleepmaker facility opposite the Site. Glimpses of the proposed development would be obtained from this car parking area. © GOOGLE

Photograph 6: This photograph shows part of the car park at the Sleepmaker facility. The Site would be visible from this car park. © GOOGLE

Photograph 7: This photograph shows the loading dock at the Sleepmaker facility opposite the Site. The front of the Site which contains the proposed office and workshop complex would be visible from this location. © GOOGLE

Photograph 8: This photograph shows the vacant land opposite and to the south east of the Site. © GOOGLE

Photograph 9: This photograph shows some of the vegetation located at the rear of the Site in the easement. This vegetation will not be impacted by the proposed development.

Photograph 10: This photograph shows the existing retaining wall located on the eastern boundary of the Site. The property to the east has been significantly filled behind the retaining wall.

8.4 Impacts of the Proposed Development

Visibility from existing residential areas

There is no visibility of the Site from residential areas.

Visibility from the locality

There are limited and heavily screened views into the southern part of the Site from

Frank Street. As seen on the plans of the proposed development, and the landscape plan in particular, the frontage of the Site will accommodate the office and workshop complex. The Landscape Plan for the Site is provided as **Appendix 12**.

The landscape plan has been conceived to create a quality landscaped area in the Frank Street streetscape which will also assist in screening the visual impact of the proposed development. An extract from the Landscape Plan is at **Figure 8-2**.

Figure 8-2: Extract from the Landscape Plan showing the proposed treatment to the Frank Street frontage of the Site.

The proposed development will be such that the delivery of waste, processing of that waste, and loading of the end products for delivery off the Site are all undertaken indoors. The visible component of the proposed development would be restricted to the car park and associated office complex and the arrival and departure of trucks servicing the Site. This activity would be entirely consistent with the majority of the industrial and warehousing activity in the locality.

8.5 Residual Impacts

The residual visual impacts of the proposal on the surrounding areas are limited. The general lack of visibility of the proposal from most viewpoints means that there are few issues requiring any mitigation measures.

The only residual issues are those of visibility into the Site from very limited view locations and directions.

Visibility of activities and equipment

The proposed ground levels of the Site and the range of tree heights in the proposed landscaping at the frontage of the Site, provide a buffer area between a potential viewer and the western boundary of the Site.

No waste processing activity would be visible on the Site from viewing locations in the public domain or residential areas.

The final matter of residual impact, which has a visual impact component, is traffic, specifically, the visibility of and character of vehicles entering and leaving the Site. Vehicles travelling to or from the Site would be indistinguishable from other traffic in th Wetherill Park industrial area. The nature and character of the proposed use would not be unique and the visibility of vehicles is not considered to be determinative.

8.6 Mitigation Measures

Buffer planting of appropriate indigenous native trees of various sizes appropriate to the screening effect and planted as shown on the Landscape Plan would, in the fullness of time, reduce or eliminate the residual visibility of the development.

The proposed buffer planting in the car park and between the proposed car park and the office and workshop component of the proposed development would help to mitigate any visual impact issues from the immediate locality. This planting would also have the effect of reducing any view of the proposal from Frank Street.

Landscape plans have been prepared for the proposed development by Tract Landscape Architects, a copy of which are at **Appendix 12**. A Landscape Design Statement is also included at **Appendix 12** which states, in part:

> *The landscape treatment for 35 – 37 Frank Street, Wetherill Park has been designed to complement the architecture of the proposed administration building, accommodate the practical aspects of the industrial facility whilst being respectful of the existing streetscape character and significantly improving the landscape amenity to the lot.*

The existing landscape character to the frontage is poor and currently comprised of only turf and various tree species in relatively modest condition. An opportunity exists to rejuvenate and significantly improve the quality of the landscape/streetscape character by incorporating a variety of elements that will complement the architecture of the building and improve the streetscape character. This would involve removing some 17 No. trees in relatively poor condition to accommodate new hardscape areas and subsequent earthworks and replacing with some 21 No. advanced specimen trees.

... The proposed landscape design has sought to provide a dedicated 5m vegetated buffer integrated with pedestrian orientated urban character within the 10m setback area, by incorporating various hard and soft landscape elements to discreetly facilitate functional movement and parking of light vehicles, whilst providing passive / contemplative space for visitors and staff to enjoy.

High quality permeable landscape materials such as Eco-Trihex within the car park area, allows stormwater to be retained on-site for longer periods of time and reduces the impact upon council's existing infrastructure during times of heavy rain. Garden beds are incorporated within the carpark area as well, to help soften visual impact of the permeable paved area.