



Genesis Waste Management Facility, Eastern Creek, Modification 6

Response to Submissions

Prepared for Dial-A-Dump (EC) Pty Ltd
November 2019





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Genesis Waste Management Facility, Eastern Creek, Modification 6

Response to Submissions

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Client

Dial-A-Dump (EC) Pty Ltd

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Executive Summary

ES1 The proposed modification

Dial a Dump (EC) Pty Ltd (the Applicant) - acquired by Bingo Industries in February 2019 - owns and operates the Genesis Xero Waste Facility (the facility) at Eastern Creek in Sydney's west.

The original project approval for the site was granted by the Minister for Planning in 2009 (MP 06_0139).

The facility is approved to accept up to 2 million tonnes per annum (tpa) of construction, demolition, commercial and industrial, special waste and green waste. It also operates subject to two Environment Protection Licences (EPLs) issued by the NSW Environment Protection Authority (EPA).

The facility undertakes a range of waste management services, including sorting, processing and recycling materials for reuse, and landfilling materials which cannot be recycled or reused.

It is proposed to modify the terms of approval for the facility by:

- increasing the annual landfill limit from 700,000 tpa to 1,000,000 tpa (exclusive of waste generated by recycling processes within the Materials Processing Centre (MPC) and the Pre-Sort Enclosure (PSE) which are the two stages of sorting materials in the co-mingled waste recycling stream);
- revising the noise impact assessment criteria; and
- extending the operating hours for the facility.

ES2 Important clarifications

There is also a need to be clear on what is not proposed and will not change as part of this modification:

- the facility is approved to receive up to 2 million tonnes per annum and this will not be increased as part of the modification;
- the types of waste accepted at the facility will not be altered as part of the modification; and
- the facility will continue to collect and treat leachate.

ES3 Why the modification is needed

ES3.1 The waste management marketplace is changing

The facility operates within the context of the Greater Sydney basin, which is facing growing pressure as non-putrescible waste generation continues to grow in line with construction activity and major infrastructure investment. Research suggests that both the number of landfills and their collective approved capacity are in decline.

Increasing the approved capacity at Eastern Creek – in terms of operating hours and the volume allowed to be sent to landfill - seeks to optimise the capacity of the site as other landfill facilities come offline. Enhancing the level of disposal capacity within the Sydney basin also reduces the overall impact of waste management, such as the avoidance of the long-haul transport for waste which generates additional environmental and amenity impacts for communities.

Given the significantly declining landfill capacity and increasing waste generation from an infrastructure boom within the Sydney region, combined with the introduction of the Queensland waste levy, there is a strong need to increase capacity for direct-to-landfill disposal at the facility.

ES3.2 The landfilling limit may cause recycling to cease at the facility

The consent does not currently distinguish between 'direct-to-landfill' waste and waste which is an unavoidable by-product of the recycling processes and which also needs to be sent to landfill.

If landfilling quantities reach the 700,000 tpa limit, then neither 'direct-to-landfill' waste nor waste by-product from the recycling of mixed materials can be disposed to landfill. Recycling of co-mingled recyclable waste via the Pre-Sort Enclosure and the Materials Processing Centre cannot occur if there is no capacity to dispose of the by-products to the landfill void. Note that disposal of this by-product waste is also a requirement of EPL 13426 which applies to the facility.

ES3.3 The landfilling limit may displace disposal elsewhere

If the landfilling limit is reached, the need for landfilling of 'direct-to-landfill' waste – such as soil contaminated by asbestos – is simply diverted to licensed facilities further afield, bringing additional impacts to communities because diversion requires more haul routes across greater distances, and can potentially incentivise illegal dumping if operators are forced to absorb the costs of trucking waste over greater distances to alternative landfill facilities.

ES3.4 The current noise criteria are a poor indicator of noise impacts

The noise criteria set via the development consent need recalibration to reflect contemporary background (ambient) levels. If a noise level performance requirement is below background noise levels (as is currently the case), it becomes an irrelevant and ineffective measure because it will not be discerned by the local community. For the purpose of regulating noise from the facility, a more meaningful set of noise criteria are required.

ES3.5 The current hours of operation are sub-optimal

There is scope for hours to be extended, and tailored to selected activities, while maintaining impacts within acceptable limits. If current hours are unchanged, then the growth in demand for recycling and landfill services will need to be accommodated within existing times. This results in a concentration of activity, including truck movements, which can bring additional impacts such as road congestion. Spreading the hours of operation can allow demand to be accommodated without imposing additional impacts on communities. There is a need to strike a balanced response to the increasing demand for waste management services. The proposed additional hours apply only to selected activities at the facility. The hours for some activities will remain unchanged.

ES4 Details about the modifications

Full details of the existing consent conditions and the proposed changes to those conditions are illustrated at Section 7.2 of this report. Summaries of the proposed changes are described below.

ES4.1 Volumes

The facility is currently approved to accept up to 2 million tonnes per annum (M tpa) of construction, demolition, commercial and industrial, green waste and asbestos waste in the landfill. The facility currently operates below the approved 2M tpa limit. It is not proposed to vary that overall limit nor is it proposed to vary the types of waste approved for processing at the facility.

The overall limit of 2M tpa is currently subject to a secondary constraint being that, of that 2M tpa, a maximum of 700,000 tpa can be disposed to landfill. It is this secondary 'landfill limit' that is the focus of the modification.

The proposed modification is to increase the annual landfill limit to 1M tpa and to clarify that this landfill limit applies only to 'direct-to-landfill' waste. The 1M tpa would not apply to waste sent to landfill as a by-product of the recycling and sorting processes which occur in the Materials Processing Centre (MPC) and the Pre-Sort Enclosure (PSE). Without this proposed exclusion of the MPC and PSE by-product waste from the landfill limit, the beneficial recycling processes which rely on some disposal of by-product to landfill may need to cease or be constrained. Waste generated through the recycling process must be disposed to the landfill in accordance with the EPL 13426, Condition L3.4.

The lifespan of the landfill will be shortened by the proposed modification, which provides benefits in terms of bringing forward the closure and rehabilitation of the landfill, and cessation of operational impacts associated with landfilling activities.

ES4.2 Hours

The proposed modification also seeks to extend the hours of operation for the facility for selected activities. A general broadening of those time periods is proposed, and also a greater distinction between different parts of those activities.

The existing and proposed hours for each activity are detailed in Table ES1 below.

Table ES1 Existing and proposed hours

Activity	Days	Existing times	Proposed times
Construction	Monday – Friday	7:00 am to 6:00 pm	No change
	Saturday	8:00 am to 4:00 pm	No change
	Public holidays	Nil	No change
MPC Operations (waste delivers and chute use)	Monday – Friday	7:00 am to 6:00 pm	24 hours
	Saturday, Sunday and Public holidays	8:00 am to 4:00 pm	24 hours
Crushing and screening	Monday – Friday	7:00 am to 6:00 pm	6:00 am to 6:00 pm
Receipt of segregated materials at the SMA site (excluding crushing and screening)	Monday – Friday	7:00 am to 6:00 pm	24 hours
MPC (including maintenance)	Monday – Friday	6:00 am to 10:00pm	24 hours
	Saturday, Sunday and Public holidays	6:00 am to 4:00 pm	24 hours
Landfill deliveries (by truck only)	Monday – Sunday	7:00 am to 6:00 pm	5:00 am to 9:00 pm

ES4.3 Noise criteria

There will be no impact on local residents from the proposed change in noise criteria.

The ambient noise levels at residential locations in Minchinbury and Erskine Park are respectively recorded as being (in $L_{Aeq, period}$ noise level³, dB) 55 and 53 for daytime; 54 and 57 for evenings; and 51 and 46 at night time.

Ambient noise levels at the nearest receivers are more than 10 dB higher than the noise limits set in the project approval and relevant Environment Protection Licences (EPL), which are:

- Day – 36 dB(A) ($LA_{eq(15 \text{ minutes})}$);
- Evening – 35 dB(A) ($LA_{eq(15 \text{ minutes})}$); and
- Morning shoulder – 35 dB(A) ($LA_{eq(15 \text{ minutes})}$).

This creates a situation where there can be a technical exceedance of the noise limits specified in the development consent and the EPL of up to 10dB, and yet that exceedance would not be able to be heard above the background noise levels. The existing noise criteria are therefore a poor predictor of actual noise impact. If a sound emanating from the facility is not able to be heard above other background noise levels (such as traffic from the M4 Western Motorway) then it has no adverse impact on the receiver.

It is recommended that the existing noise criteria be re-calibrated to a more meaningful level so that both the facility operator, environmental regulator and the local communities have a meaningful measure by which to manage potential impacts. The proposed new noise impact thresholds are shown in Table ES2 below.

Table ES2 **Proposed new noise impact thresholds**

Location	Day		Evening		Night		Morning shoulder	
	$LA_{eq(15 \text{ minute})}$	dB(A)	$LA_{eq(15 \text{ minute})}$	dB(A)	$LA_{eq(15 \text{ minute})}$	dB(A)	$LA_{eq(15 \text{ minute})}$	dB(A)
Minchinbury residential receivers	48		47		44		47	
Erskine Park residential receivers	39		40		37		40	

ES5 The environmental management system for the facility

The facility operates subject to a number of operational plans which form part of the Environmental Management System for the site. These are required as conditions to the development consent for the facility.

These plans and strategies remain relevant to the operation of the facility and the proposed changes within this modification do not radically alter the fundamental aspects of the facility which are addressed by the management plans. The plans will be updated to reflect the changes arising from this proposed modification.

ES6 The exhibition of the environmental assessment

An environmental assessment report was prepared for the Applicant by EMM Consulting Pty Limited (EMM) in August 2018.

The report was placed on public exhibition, in accordance with Division 6 of Part 6 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), between 3 October 2018 and 17 October 2018.

Copies of the environmental assessment report were made available via Blacktown City Council offices as well as via the Department of Planning, Industry and Environment (DPIE) website.

During the exhibition period, submissions were invited from all stakeholders, including members of the community and government authorities.

A total of 66 submissions were received from community members.

A total of 10 submissions (plus several supplementary items of correspondence after the exhibition period) were received from public authorities, including State and local government.

ES7 The matters raised by respondents

Most of the community responses were from residents in Minchinbury and Erskine Park. The issues most frequently raised by the respondents were:

- noise;
- air quality (including 'pollution');
- traffic;
- odour;
- asbestos;
- health impacts; and
- impacts on local amenity and residential land use.

Public authorities were also invited to prepare submissions regarding the proposed modifications. The public authorities included local councils and also State agencies such as the Environment Protection Authority, Transport for NSW, the (then) Department of Industry and the (then) Office of Environment and Heritage.

The issues raised by public authorities included:

- the lifespan of the landfill;
- traffic;
- noise;
- air quality;
- leachate;
- lighting; and
- facility design considerations.

ES8 Addressing the matters raised

All of the main issues, as well as those issues registering fewer comments, were able to be addressed through the provision of additional information or further explanatory text.

A few matters were raised which were considered out of scope. Notably there were some community references to the previously proposed 'waste to energy' facility which is not within the subject site or the subject of this modification, is unrelated to the operation of the subject facility, and was the focus of a separate development proposal. It should also be clarified that the proposal does not seek to vary the 2M tpa gate limit, which is already a condition of the existing approval.

Other than the replacement of Appendix B to the Environmental Assessment - Noise Impact Assessment Report - with the correct version of the Noise Impact Assessment Report, the Environmental Assessment remains unchanged.

All of the issues raised by respondents are addressed in the Response to Submissions Report.

The responses to submissions are often quite lengthy because many of the submissions required background material to be provided or for complex issues to be explained in detail.

ES9 The future of the facility

The facility at Eastern Creek is part of a broader network of waste management facilities across Sydney. This facility, and others, fulfil an important role in the way that the city functions.

While waste generation can be reduced, the population growth, urban development and infrastructure programs which inevitably create waste materials will continue for the foreseeable future.

The facility at Eastern Creek provides two important services to the community. It enables more efficient and effective use of resources by providing facilities to sort, screen and process recyclable waste materials and then adding value by providing the recycled materials to the market for application in a wide range of developments. The facility also provides an essential means to dispose of waste to landfill where landfilling is the only safe and economic solution for certain waste streams.

The facility is also appropriately licensed to undertake this activity and has the benefit of an existing development consent to receive up to 2M tonnes of waste each year.

This modification seeks to change some of the conditions of the existing development consent which are, or are likely to, create adverse - and perhaps unforeseen - outcomes. For example, the current limit on landfilling will potentially cause the facility to cease recycling as well as curtailing receipt of any 'direct-to-landfill' waste because the process of recycling produces non-recyclable by-products which also need to be disposed to landfill.

While there are no simple solutions, a waste management facility needs to deal in waste, and there are impacts associated with that activity. The proposed modification has carefully considered how changes can be made to the conditions relating to volumes, hours and noise criteria while achieving impact levels within objective government guidelines and taking into account both the concerns of the local community and the needs of the broader urban areas of Sydney in terms of demand for waste management.

It is important to note that this proposed modification does not alter the approved 2M tpa 'gate limit' for the facility nor the types of waste which are authorised to be received on site. It does not seek to enlarge to operational area of the facility nor the general arrangement of plant and equipment on site.

The modification was proposed so that the operator of the facility can meet the policy objectives of the NSW Government for recycling, accommodate the increasing demands of Sydney's development activities, and to recalibrate noise measures so that they are meaningful and reliable as indicators of adverse impacts.

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1 Introduction

1.1 The existing facility

Dial a Dump (EC) Pty Ltd (the Applicant) owns and operates the Genesis Xero Waste Facility (the facility) at Eastern Creek in Sydney's west. The facility is located at 1 Kangaroo Avenue and comprises a resource recovery facility and a general solid waste (non-putrescible) landfill. The landfill is a former quarry site and the resource recovery operations involve a Materials Processing Centre (MPC), a Pre-Sort Enclosure (PSE), a Segregated Material Area (SMA), and a Waste Transfer Station.

The landfill void (former quarry) comprises approximately 75% of the site area. The MPC, PSE, timber waste, green waste, sales yard, SMA (ie crushing and screening area) and workshop area are situated in the west and north-west sectors of the site. The operational areas of the site are surrounded to the east, west and north by an environmental bund constructed of overburden from the former quarry which shields receptors from views of, and light and noise generated from, the facility.

The facility is approved to accept up to 2 million tonnes per annum (2M tpa) of construction, demolition, commercial and industrial and green waste. It is also licensed to accept special waste, such as asbestos. There are two main processing streams at the facility depending on the characteristics of the waste being delivered to the site:

- direct-to-landfill; and
- materials recovery and recycling.

Direct-to-landfill is necessary for contaminated waste such as soil containing asbestos fragments. Much of the recent growth in landfill inputs at the facility is asbestos contaminated soils and asbestos containing materials which accounted for more than 60% of landfill inputs in FY2017-18. This type of waste cannot be recycled and disposal to a licensed landfill facility is the method required by regulation. This stream is expected to continue growing as the NSW construction and redevelopment boom continues and the number of alternative disposal sites reduces.

The materials recovery and recycling represent the processing stream for the majority of the waste received. This waste is directed to the resource recovery facilities (such as PSE, MPC and SMA) for sorting, processing and resale as products suitable for application to land such as road base. The facility recycles an estimated 65-80% of all incoming waste. Material which is unsuitable or uneconomical for recovery or recycling is subsequently disposed to landfill. Landfilling is estimated to account for approximately 30% (on average) of the mixed waste which is processed through the PSE and MPC.

The facility currently landfills at a rate of approximately 629,000 tpa (from both direct-to-landfill sources and residual wastes from the PSE and MPC).

1.2 Background to this modification application

Please note that Dial a Dump (EC) Pty Ltd was acquired by Bingo Industries in February 2019. Dial a Dump (EC) Pty Ltd nevertheless remains the Applicant for this modification.

Please also note that in this Response to Submissions report and in the environmental assessment reports prepared for Modification 6, there is occasional reference made another Application to Modify the Consent for this facility, being Modification 7.

At the time at which the assessments for Modification 6 were prepared and during the public exhibition period for the Modification 6 environmental assessments, Modification 7 had been lodged with the Department of Planning, Industry and Environment.

The application for Modification 7 has subsequently been withdrawn.

The intent of Modification 7 was to reconfigure some of the roads, plant and buildings on site, and to install new weighbridges, an amenity wall and related infrastructure. All of those matters are no longer the subject of an application to modify the consent for the facility.

Modification 7 was prepared separately to Modification 6 and the two modifications were always independent proposals. The two modifications were not co-dependent, and the withdrawal of Modification 7 has no impact on Modification 6. Nevertheless, for chronological accuracy, some sections of the Modification 6 assessments still refer to Modification 7.

Also note that the Applicant engaged Arcadis Australia Pacific to undertake an independent peer review of the report prepared by EMM. This quality assurance measure will provide greater confidence to agency and community respondents that issues were adequately addressed.

1.3 References to the NSW Department of Planning, Industry and Environment

In the interests of simplicity, all references to the Department of Planning, Industry and Environment (DPIE) in this document are taken to also include references to the former Department of Planning and Environment (DPE) which was in existence during the initial stages of the application.

1.4 The proposed modification

It is proposed to modify the terms of approval for the facility by:

- increasing the annual landfill limit from 700,000 tpa to 1,000,000 tpa (excluding waste generated by recycling processes within the Materials Processing Centre (MPC) and the Pre-Sort Enclosure (PSE) which are the two stages of sorting materials in the co-mingled waste recycling stream);
- revising the noise impact assessment criteria; and
- extending the operating hours for the facility.

1.5 Statutory context

The original project approval for the site was granted by the Minister for Planning in 2009 (MP 06_0139) under Section 75J of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The operations commenced in 2012 and the project approval has been modified five times, most recently in March 2016. The facility also operates subject to two Environment Protection Licences (EPLs) issued by the NSW Environment Protection Authority (EPA).

The application to modify the existing planning approval was made under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Applicant applied for Secretary's environmental assessment requirements (SEARs) for the proposed modification on 1 March 2017. SEARs, including requirements from other government agencies, were received from the DPIE on 3 April 2017.

1.6 Environmental assessment

An environmental assessment report was prepared for the Applicant by EMM Consulting Pty Limited (EMM) in August 2018. The report was placed on public exhibition, in accordance with Division 6 of Part 6 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), between 3 October 2018 and 17 October 2018. Copies of the environmental assessment report were made available via Blacktown City Council offices as well as via the Department of Planning, Industry and Environment (DPIE) website. During the exhibition period, submissions were invited from all stakeholders, including members of the community and government authorities.

A total of 66 submissions were received from community members.

A total of 10 submissions were received from public authorities, including State and local government.

The submissions received during the public exhibition period are the focus of this report, known as a Response to Submissions (RTS). The RTS tabulates the submissions, identifies and analyses the issues raised, and proposes a means by which those issues can be addressed.

1.7 Additional strategic justification for the proposal

The strategic justification is explained in detail in Section 4.2 of the Modification 6 Environmental Assessment.

Following the lodgement of the modification application in September 2018 and the introduction of the Queensland waste levy in March 2019 additional analysis, summarised below, has been undertaken on the compelling strategic need for this proposal.

The Genesis Waste Management Facility at Eastern Creek operates within the context of the Greater Sydney basin, which is facing growing pressure as non-putrescible waste generation continues to grow in line with construction activity and major infrastructure investment.

Previous analysis completed by MRA (2018) presented below (Figure 1.1) for Bingo Industries has identified a number of existing non-putrescible waste landfills and one planned landfill within the metropolitan region. However, both the number of landfills and their collective approved capacity are in decline. Major sites have closed, including Spring Farm Landfill in 2016, and others set to close in the next 1-2 years include the significant Erskine Park and Horsley Park landfills (Figure 1.2).

No.	Dry Landfill	CALCULATING TOTAL VOID SPACE				Licence limit (tpa)	CALCULATING RECEIVAL RATE T/YR			Expected closure year (est. see caveat)	Notes
		Estimated existing min void space (t)	Stated Cap volume (t) ³	Estimated Cap volume (t) ⁴	Total void space including cap volume (t)		T received Landfilled in Sydney/yr (A)	T received Transported to QLD /yr (B)	Capacity to absorb (tpa) A+B+New Patons lane receipts		
1	Dial-a-Dump Genesis	9,600,000	-	-	9,600,000	700,000	690,000	-	690,000	2033	-
2	SUEZ Kemps Creek	7,000,000	8,400,000	-	15,400,000	unlimited	1,400,000	-	1,400,000	2030	SUEZ application for extension likely to be approved
3	Veolia Horsley Park	430,000	-	-	430,000	430,000	430,000	-	430,000	2019	Veolia have stated they will transport to Woodlawn once full
4	Brandown	3,200,000	-	1,869,610	5,069,610	unlimited	-	250,000	250,000	2040	MRA estimated additional cap
5	Kurnell Landfill	2,000,000	-	-	2,000,000	unlimited	200,000	-	200,000	2029	No cap increase assumed
6	Glenfield Waste Services	1,800,000	-	1,007,230	2,807,230	unlimited	75,000	-	75,000	2040	MRA estimated additional cap
7	Blacktown Waste Services	600,000	-	619,540	1,219,540	360,000	100,000	-	100,000	2032	MRA estimated additional cap
8	Kelso Landfill	11,366	-	-	11,366	unlimited	25,000	-	25,000	2020	No cap increase assumed
9	Kimbriki Environmental Enterprises	2,968,778	-	-	2,968,778	unlimited	60,000	-	60,000	2040	No cap increase assumed
10	Greenwood Landfill	18,736	-	-	18,736	15,000	1,000	-	1,000	2038	No cap increase assumed
11	Sydney Recycling Park	650,000	150,000	-	800,000	unlimited	-	150,000	150,000	2025	Sending sig volumes to QLD
12	Patons Lane	4,300,000	-	-	4,300,000	205,000	-	-	205,000 ⁵	2040	-
13	Cleanaway Erskine Park	360,000	-	-	360,000	1,000,000	-	120,000	120,000	2022	Sending sig volumes to QLD
	Total				45 Mt⁶		2.9 Mt		3.7 Mt		

Figure 1.1 Sydney landfill throughput capacity

At the same time, only one new landfill has been approved in the Sydney basin this century, Bingo's own Patons Lane facility, and no new greenfield landfills are likely to be approved due to community sensitivity and the rising cost of land.

Increasing the approved capacity at Eastern Creek to 1M tpa seeks to optimise the capacity of the site as other facilities come offline. Securing disposal capacity within the Sydney basin also reduces the long-haul transport of waste, supporting NSW Government objectives to avoid the environmental and amenity impacts of this practice.

Further, the final version of the standards no longer includes mandatory minimum recovery rates for B&D facilities, initially proposed at 75% for any facility receiving more than 30,000 tonnes per annum and 50% for smaller facilities.¹ The stipulated floor in recovery rates was intended to increase the diversion of B&D waste from landfill to productive uses in the economy. Its removal will almost certainly increase the landfilling of B&D waste compared to expectations, while simultaneously waste to Queensland is likely to decline due to the introduction of the Queensland landfill levy.

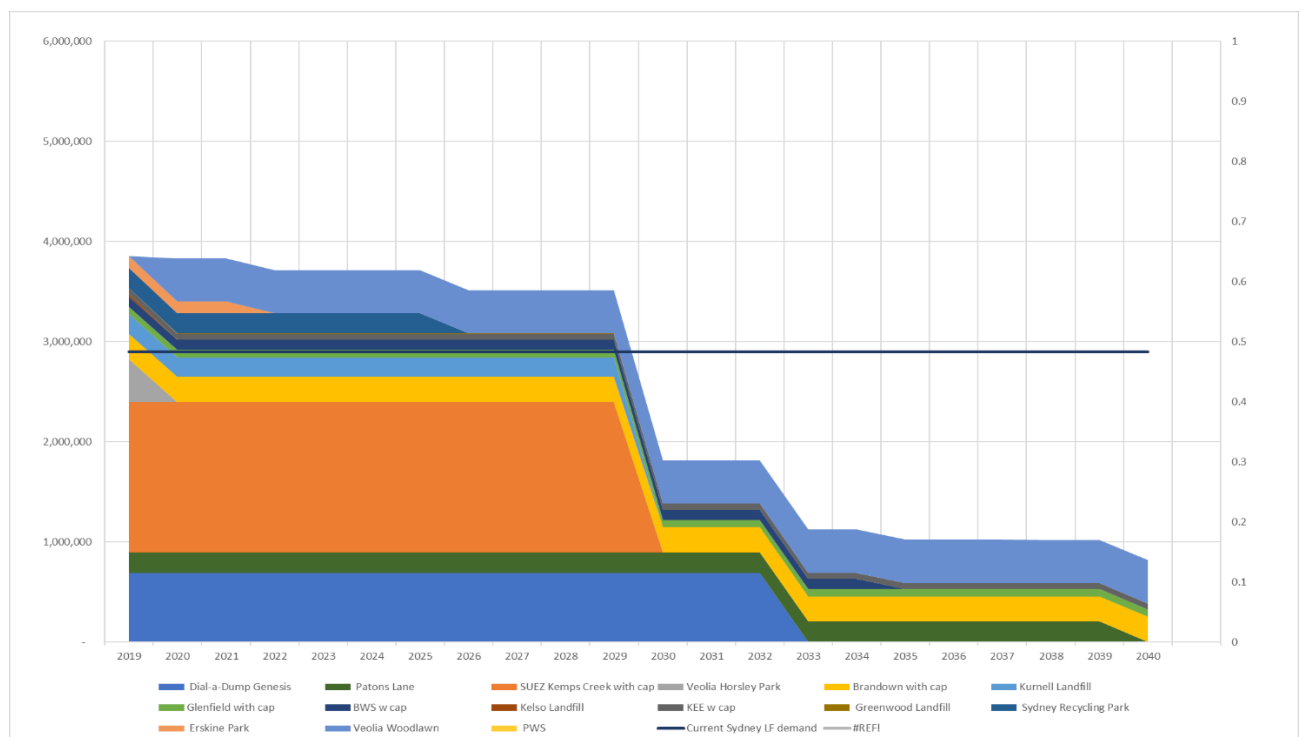


Figure 1.2 Forecast non-putrescible landfill capacity and closure in the Sydney basin (MRA, 2018)

Given the significantly declining landfill capacity and increasing waste generation from an infrastructure boom within the Sydney region, combined with the introduction of the Queensland levy, there is a strong need to increased capacity for direct-to-landfill disposal at the Genesis Waste Management Facility.

¹ https://www.epa.nsw.gov.au/~/_media/EPA/Corporate%20Site/resources/wasteregulation/nsw-managing-construction-demolition-waste-minimum-standards-160545.ashx

2 Overview of the exhibited project

There are three key elements to the proposed modification. It is proposed to:

- increase the annual landfill volume limit;
- extend the hours of operation; and
- re-set the existing noise criteria to a meaningful level.

2.1 Volumes

The facility is currently approved to accept up to 2 million tonnes per annum (M tpa) of construction, demolition, commercial and industrial, special waste (asbestos) and green waste. The facility currently operates at well below that approved 2M tpa limit. It is not proposed to vary that overall limit nor is it proposed to vary the types of waste approved for processing at the facility.

The overall limit of 2M tpa is currently subject to a secondary constraint being that, of that 2M tpa, a maximum of 700,000 tpa can be disposed to landfill. It is this secondary 'landfill limit' that is the focus of the modification.

The proposed modification is to increase the annual landfill limit to 1M tpa and to clarify that this landfill limit applies only to 'direct-to-landfill' waste. The 1M tpa would not apply to waste sent to landfill as a by-product of the recycling and sorting processes which occur in the Materials Processing Centre (MPC) and the Pre-Sort Enclosure (PSE). Without the proposed exclusion of the MPC and PSE by-product waste from the landfill limit, the beneficial recycling processes which rely on some disposal of by-product to landfill may need to cease or be constrained. Waste generated through the recycling process must be disposed to the landfill in accordance with the EPL 13426, Condition L3.4.

The proposed increase in the landfill limit also acknowledges the growing demand for appropriate facilities to where direct-to-landfill waste can be accommodated.

The lifespan of the landfill will be shortened by the proposed modification, which provides benefits in terms of bringing forward the closure and rehabilitation of the landfill, and cessation of operational impacts associated with landfilling activities.

The landfill lifespan is a function of a number of variables, the key ones being:

- the remaining landfill void (airspace) which is fixed and not proposed to change under this modification;
- the rate of annual waste inputs to the landfill (in tonnes per annum) which is proposed to increase under this modification; and
- the average density of the waste in the landfill (after compaction), which determines how much volume each tonne of waste consumes.

The current direct-to-landfill waste is predominantly heavy streams such as asbestos soils and general non-putrescible waste. There are light (low density) streams such as shredder flock and residuals from the PSE and MPC which are also low density. It is difficult to predict the future waste mix as this will be driven by market demand, but if there is an increase in the proportion of light materials and a reduction in the overall average density of waste to landfill, then landfill airspace will be consumed more quickly for a given input tonnage.

By way of example, two scenarios are presented:

- Business-as-usual under the current approval with total waste to landfill (including PSE and MPC residuals) limited to 700,000 tpa. Based on the most recent landfill survey data, the remaining void (as of July 2018) was 9.6 million cubic metres and the average airspace utilisation rate was 1.24 tonnes per cubic metre. Assuming no significant change in the waste mix, the landfill would be full around 2035.
- Under an alternative scenario where the direct-to-landfill annual rate is increased to 1 million tonnes per annum with the same waste mix, and the PSE/MPC throughput is increased (due to 24 hour running) to a nominal 350,000 tpa (leaving up to 650,000 tpa to go through the SMA) and PSE/MPC residuals are addition to the direct-to-landfill stream; the landfill lifespan would be reduced by an estimated 7 years to around 2028².

This alternate scenario is for demonstration purposes only. There are numerous permutations that could be considered for different waste mixes and throughputs to the PSE/MPC, and these would influence the rate of filling for the void.

2.2 Hours

The proposed modification also seeks to extend the hours of operation for the facility for selected activities. The current consent allows for a varying set of hours for each major element of operation. For example, MPC operation and maintenance can currently occur between 6:00 am and 10:00 pm Monday to Friday, and crushing or screening can occur over a lesser period of 7:00 am to 6:00 pm Monday to Friday. Times are also different on weekends. The principle of setting different time periods for different activities will be maintained. What is proposed in this modification is a general broadening of those time periods, and also a greater distinction between different parts of those activities. For example, there is no change proposed for construction hours; crushing and screening is extended by one hour; and the operation of the MPC (an enclosed building) is proposed to be available 24 hrs.

Overall, the proposed modification is seeking a balanced and responsible arrangement for the operation of the facility so that it can accommodate the growing demand for waste management in Sydney, while addressing the legitimate concerns of the community.

Note that a reference to the proposed hours for an activity means the suite of activities associated with normal functioning of those areas of the facility, and not to a specific building. Hence, the activity of “MPC” includes pre-sorting within the Pre-Sort Enclosure (PSE) which is adjacent to the building called the Materials Processing Centre (MPC). The PSE and the MPC buildings are both components of materials processing and are generically referred to as the “MPC activity”.

The existing and proposed hours for each activity are detailed in Table 2.1 below.

² Based on an assumed 25% residuals from the MPC process with a compacted density of 0.5t/m³.

Table 2.1 Existing and proposed hours

Activity	Days	Existing times	Proposed times
Construction	Monday – Friday	7:00 am to 6:00 pm	No change
	Saturday	8:00 am to 4:00 pm	No change
	Public holidays	Nil	No change
MPC Operations (waste delivers and chute use)	Monday – Friday	7:00 am to 6:00 pm	24 hours
	Saturday, Sunday and Public holidays	8:00 am to 4:00 pm	24 hours
Crushing and screening	Monday – Friday	7:00 am to 6:00 pm	6:00 am to 6:00 pm
Receipt of segregated materials at the SMA site (excluding crushing and screening)	Monday – Friday	7:00 am to 6:00 pm	24 hours
MPC (including maintenance)	Monday – Friday	6:00 am to 10:00pm	24 hours
	Saturday, Sunday and Public holidays	6:00 am to 4:00 pm	24 hours
Landfill deliveries (by truck only)	Monday – Sunday	7:00 am to 6:00 pm	5:00 am to 9:00 pm

2.3 Noise criteria

The proposed changes to the noise criteria have no impact on local residents.

The ambient noise levels at residential ('sensitive receptor') locations in Minchinbury and Erskine Park are respectively recorded as being (in $L_{Aeq, period}$ noise level³, dB) 55 and 53 for daytime; 54 and 57 for evenings; and 51 and 46 at night time.

Ambient noise levels at the nearest receivers are more than 10 dB higher than the noise limits set in the project approval and relevant Environment Protection Licences (EPL), which are:

- Day – 36 dB(A) ($L_{Aeq(15\text{ minutes})}$);
- Evening – 35 dB(A) ($L_{Aeq(15\text{ minutes})}$); and
- Morning shoulder – 35 dB(A) ($L_{Aeq(15\text{ minutes})}$).

This creates a situation where there can be a technical exceedance of the noise limits specified in the development consent and the EPL of up to 10dB, and yet that exceedance would not be able to be heard above the background noise levels. The existing noise criteria are therefore a poor predictor of actual noise impact. If a sound emanating from the facility is not able to be heard above other background noise levels (such as traffic from the M4 Western Motorway) then it has no adverse impact on the receiver.

It is recommended that the existing noise criteria be re-calibrated to a more meaningful level so that both the facility operator, environmental regulator and the local communities have a meaningful measure by which to manage potential impacts. These changes will have no impact on local residents.

The proposed new noise impact thresholds are:

Table 2.2 **Proposed new noise impact thresholds**

Location	Day	Evening	Night	Morning shoulder
	LA _{eq} (15 minute) dB(A)	LA _{eq} (15 minute) dB(A)	LA _{eq} (15 minute) dB(A)	LA _{eq} (15 minute) dB(A)
Minchinbury residential receivers	48	47	44	47
Erskine Park residential receivers	39	40	37	40

2.4 Revisions to the proposal

The matters raised in the submissions from authorities and the community generally required a response in the form of clarification or additional information. That information is recorded in Section 4 and 5 of this report (being the responses to public authority submissions and the responses to community submissions respectively), forms part of the overall assessment of the proposed modification and should be read in conjunction with the Environmental Assessment (EMM 2018).

One of the matters noted in submissions was that the noise impact assessment report (Appendix B to the Environmental Assessment) was not the most current version and not the version referenced in the Environmental Assessment. The original proposal is therefore revised to the extent that the appropriate Appendix B is now provided. Please refer to the Addenda section of the report where the appropriate version is provided.

Broadly, the proposed modification remains as originally described, and the remainder of the Environmental Assessment and Appendices are also as originally submitted. No additional mitigation works are proposed.

2.5 The purpose of this report

The purpose of this RTS is to analyse and respond to matters raised in submissions from stakeholders during the exhibition period.

Section 4.39(e) of the EP&A Act provides for the Regulations to require applicants to prepare a response to submissions relating to State significant development. Clause 85A of the EP&A Regulation further requires the Planning Secretary to provide the submissions (or a summary of the submissions) to the applicant and may also require the applicant to prepare a written response to issues raised in those submissions.

A request to prepare a RTS was issued by DPIE on 1 November 2018.

The request for a RTS requires the applicant to:

- provide a written response to each of the issues raised; and
- provide a response to specific matters raised by DPE in an attachment to the letter.

A copy of the letter, including the attachment, is provided at Appendix D.

The issues identified by DPIE in the letter dated 1 November 2018 were:

- general matters (such as life expectancy of the landfill);
- traffic and parking;

- air quality and odour; and
- noise.

All of these issues are addressed in this report.

The responses provided via this Response to Submissions Report form part of the assessment documentation related to the proposed modification.

3 Exhibition and consultation

3.1 Consultation prior to public exhibition

During the preparation of the environmental assessment and the development of the proposed modification, the Applicant undertook consultation with, or received advice from:

- Department of Planning, Industry and Environment (DPIE);
- NSW Environment Protection Authority (EPA); and
- Blacktown City Council.

The consultation was conducted face to face, by telephone and by email.

3.2 Consultation during the public exhibition

The Applicant met with Blacktown City Council during the exhibition period (2 October 2018). The Applicant provided an email response direct to Blacktown City Council (15 October 2018) in response to the matters raised by Council at that meeting.

As noted in Section 3 of this report, several public authorities made submissions during the exhibition period. Details of the issues raised by public authorities, and responses to those matters, are provided in Section 4

Community submissions and the responses to matters raised by the community are detailed in Section 5.

3.3 Consultation after the exhibition period

3.3.1 Overview

Following the public exhibition of the proposed Modification and the related Environmental Assessment, an initial Response to Submissions was prepared by the Applicant and provided to DPIE. The initial Response to Submissions report addressed the range of matters identified by the community and public authorities during the exhibition period.

While the initial Response to Submissions report was not publicly exhibited, DPIE indicated that further feedback would be considered from interested parties while the initial Response to Submissions report was under consideration by DPIE.

The feedback during the post-exhibition period drew attention to some key matters which had been identified in the Environmental Assessment but which required additional information and analysis in order for the issues to be fully resolved. The issues which were raised included:

- the modelling and management of air quality and odour impacts;
- the compatibility of the waste facility with the character of surrounding development;
- the implications of changing or not changing landfilling limits;
- the implications of changing or not changing residential noise criteria;

- whether the proposed changes were consistent with State government policy settings for noise and recycling; and
- local concerns regarding the (unrelated) energy from waste facility.

It is acknowledged that many of these matters are inherently complex and that they remain matters of interest and concern for the community. The Applicant therefore attended a series of meetings with DPIE and the EPA to work through the concerns and to provide, where required, additional analysis and advice. The Applicant commissioned additional information from technical specialists in order to more fully articulate the basis for the findings of the Environmental Assessment.

The concerns regarding the earlier development application, by another party, on adjacent land and previously refused, for an energy from waste facility suggested that this Modification may 'pave the way' for a more positive determination of the energy from waste proposal. The two matters are entirely separate and subject to independent planning assessment pathways.

Additional advice was provided to DPIE and the EPA by the Applicant for all of the other matters, to the satisfaction of those authorities. The process of refining and detailing the assessment process during the post-exhibition period was the subject of a series of formal request-and-response initiatives between the Applicant and the regulatory authorities. The sequence of the post-exhibition requests and responses is detailed below. Copies of the letters are provided in the Appendices.

3.3.2 Requests for additional information and responses provided

Representatives from Dial-A-Dump (EC) Pty Ltd (now owned by Bingo Industries) and EMM Consulting met with staff from DPIE and EPA at the Pitt Street Offices of DPIE on 16 May 2019 to discuss the range of matters raised in the submissions. This was an opportunity to brief officers from DPIE and EPA on the main issues raised via community and public authority submissions. No additional or specific issues were raised by DPIE or EPA. The Applicant was able to provide verbal advice and explanation on key attributes of the proposed modification, including noise, air quality, traffic and lighting.

After the close of the public exhibition period for the original Response to Submissions Report, DPIE received a letter from commercial law firm Allens Linklaters on behalf of Jacfin Pty Ltd (**Appendix F**). The letter, dated 2 August 2019, was made in response to the Response to Submissions (RTS) Report of 28 May 2019 which was submitted to DPIE but not placed on formal exhibition. The letter from Allens Linklaters raised issues principally regarding air quality, odour, noise, local character and context, landfill limits and the previously proposed energy from waste facility (not the subject of this proposed modification). The letter from Allens Linklater also provided copies of two independent reports prepared by consultants Katestone (air quality and odour) and Wilkinson Murray (noise).

DPIE subsequently sought advice from the EPA regarding the matters raised in the Allens Linklater letter. A copy of the Allens Linklater letter was also made available to the Applicant.

On 30 August 2019, the EPA responded to DPIE (**Appendix G**). In that letter, the EPA noted the matters raised by Allens Linklater on behalf of Jacfin Pty Ltd, and made a number of comments, principally recommending that additional information and advice be prepared by the Applicant in response to a range of specific matters raised by Allens Linklater.

The Applicant met with DPIE officers on 9 September 2019 to seek the views of DPIE regarding the matters raised in the Allens Linklater letter. On the basis of that feedback, the Applicant undertook to consider and formally address to the matters raised in the Allens Linklater letter.

Blacktown City Council also submitted a letter to DPIE dated 12 September 2019 regarding the Response to Submissions report (**Appendix H**). DPIE had, in a letter dated 31 May 2019, invited Council to consider the Response

to Submissions report. The letter in reply from Council stated that the Council did not object in principle to the proposed modification but did object to the proposed extended hours of operation. Council's view was that noise generating activities should not occur outside the period of 10:00 pm to 07:00 am.

The Applicant referred additional advice and information to DPIE in a letter dated 26 September 2019 (**Appendix I**) which included a tabulated set of responses to the EPA matters and an analysis prepared by EMM Consulting on 23 September (**Appendix J**).

On 30 September 2019, DPIE referred to the EPA a copy of the advice prepared by the Applicant to address the range of matters under consideration. DPIE requested a further response from the EPA.

The EPA provided that further advice to DPIE on 16 October 2019 (**Appendix K**). That EPA letter to DPIE, dated 16 October 2019, noted that all issues previously raised regarding noise were now adequately addressed and the EPA raised no further comments. With regard to air quality, the EPA expressed a view that all issues previously raised were now adequately address with the exception of the matter regarding peak daily emissions. The EPA recommended that the Applicant undertake an assessment accounting for potential peak throughput at the landfill. An alternative of simply limiting landfilling to 2,740 tonnes per day was identified.

DPIE provided a copy of the EPA letter dated 16 October 2019 to the Applicant, and in reply the EMM Consulting was invited by the Applicant to prepare a letter to DPIE in response.

The Applicant responded to the EPA in a letter dated 24 October 2019 (**Appendix L**), which included a copy of EMM advice to the Applicant dated 22 October 2019 (**Appendix M**). The EMM advice included a frequency analysis of predicted concentrations for three distinct landfill scenarios, being:

- a typical day (2,740 tonnes to landfill);
- a peak day (4,100 tonnes to landfill); and
- a theoretical worst-case day (5,400 tonnes to landfill).

For each receptor and landfill disposal rate, the likelihood of additional exceedance day relative to existing background was calculated. The upscaling of modelling to identify predicted concentrations demonstrated that disposal of waste to the landfill at representative peak day or theoretical worst case day rates would not significantly alter the potential for exceedance of the 24 hour average PM₁₀ or PM_{2.5} criterion at any of the surrounding receptors, compared to the modelling for the typical landfill disposal rates which were used in the Air Quality Impact Assessment.

Further, the use of reactive management measures would assist in the control of potential cumulative exceedance days, irrespective of the landfill disposal rate that may occur on any given day. The use of reactive management measures was a recommended condition of consent in an earlier letter (21 June 2019) from the EPA and was also agreed to by the EPA when the Applicant and technical specialists met with the EPA Air Quality Technical Unit on 23 October 2019.

The final letter from the EPA, dated 8 November 2019 (**Appendix N**) noted that the EPA had reviewed the additional information and the EPA made a number of specific comments, noting:

The additional information adequately addresses the residual issue of assessing peak daily throughputs to the landfill. As such, the EPA does not recommend a daily cap on throughput of waste to the landfill as previously stated in EPA letter dated 16 October 2019;

Acknowledgment that Bingo has committed to boundary air monitoring to inform reactive management measures including relocation of the existing ambient air monitoring station to a boundary location adjacent to the neighbouring industrial receptor, such that reactive management measures can be used to minimise the potential for adverse impacts from site operations; and

The largest particulate matter emission sources associated with the proposal is haul roads. Assessed haul road emissions assume a high control efficiency (90%). On that basis it is unlikely that additional reactive measures for minimising haul road emissions would be able to be implemented, other than ceasing particular operations when boundary monitoring results show significant changes in particulate matter concentrations. Given the predicted exceedances of particle impact assessment criteria, the EPA recommends the proponent investigates additional proactive emission control measures, including sealing of all internal haul roads.

4 Overview of submissions

During the exhibition period, a number of submissions were received from government authorities and the community.

There was a total of 13 responses from public authorities and 66 public submissions.

All submissions have been considered in the context of the proposed modification, including the matters raised in letters from Jacfin Pty Ltd, DPIE and the EPA in the post-exhibition period.

4.1 Submission response methodology

Public submissions were recorded and tabulated to identify the key issues raised in each submission. There was noted to be a number of matters, such as noise, air quality, traffic etc, which tended to be raised by multiple stakeholders, and in the interests of simplicity, the response to those 66 submissions has been based on the issues raised in submissions rather than an individual (and potentially repetitive) response to each individual stakeholder. Each public submission has been assigned a unique number and where responses are articulated there is cross referencing to assist those individual stakeholders to identify where their issues are summarised and addressed.

Public authority submissions tended to reflect the specific interests of each authority and there were few issues which were common across those submissions. The public authority responses are therefore addressed individually.

4.1.1 Technical matters

There were a number of technical matters raised, particularly but not exclusively by government authorities, and the Applicant has referred those matters to relevant technical experts for advice. This involved, where appropriate, checking and revision of modelling and analysis for impact assessment.

4.2 Submissions received - government authorities

Submissions were received from:

- Department of Planning, Industry and Environment (DPIE) ;
- Environment Protection Authority (EPA);
- Department of Industry;
- NSW Fire and Rescue;
- Roads and Maritime Services (RMS);
- Office of Environment and Heritage (OEH);
- Endeavour Energy;
- TransGrid (x2);
- Transport for NSW (TfNSW);
- Sydney Water Corporation (SWC);

- Penrith City Council; and
- Blacktown City Council.

Some of the public authority responses acknowledged the proposal and did not raise any issues. This includes submissions from SWC, TfNSW, Department of Industry and OEH. These submissions are noted and will not be considered further as part of this Response to Submissions.

TransGrid made two submissions, one indicating no issues and a supplementary submission that outlined a range of measures which are required to protect the assets, access and interests of TransGrid in and near the site.

The remaining responses from government agencies identified a number of matters, ranging widely in terms of subject and complexity, relevant to the regulatory functions of those individual agencies. Responses to government authority submissions are detailed in Section 4 of this document.

4.3 Submissions received - community

There were 66 submissions received from community stakeholders. Many of the submissions did not identify the respondent but did indicate the location stated by the respondent (eg Minchinbury). Each of the submissions has been assigned a unique identifier number to assist in tabulating the responses. Refer to Table 6.1.

The vast majority of respondents who identified a location nominated adjoining local suburbs of:

- Minchinbury; and
- Erskine Park.

Other locations identified by respondents were:

- Rooty Hill;
- Seven Hills;
- Blacktown;
- St Clair;
- Emu Plains;
- Greystanes;
- Currans Hill;
- Emu Plains;
- Sydney (non-specific); and
- Banyo, Qld.

All submissions identified that the responses were objections to the proposal. There was one submission which originally identified as a response in support of the proposal but the respondent later revised that response to be identified as an objection.

The key matters raised in public submissions, and the number of times that specific concern was raised in submissions, are summarised in Table 4.1 and Figure 4.1 below.

The most frequently raised concerns were:

- noise;
- air quality (including 'pollution');
- traffic;
- odour;
- asbestos;
- health impacts; and
- impacts on local amenity and residential land use.

Table 4.1 Public submissions – concern and number of times raised

Concern regarding project	Number of times raised
Noise	35
Air quality (including dust and 'pollution')	28
Traffic	21
Odour	21
Asbestos	16
Health impacts	16
Impacts on local amenity and character / Inappropriate near residential areas / Nuisance	14
Public interest / Waste increases	8
Road impacts and public safety	5
Incinerator / Energy from Waste facility	5
Non-specific objection	4
Impact on local property values	1
Climate change	1

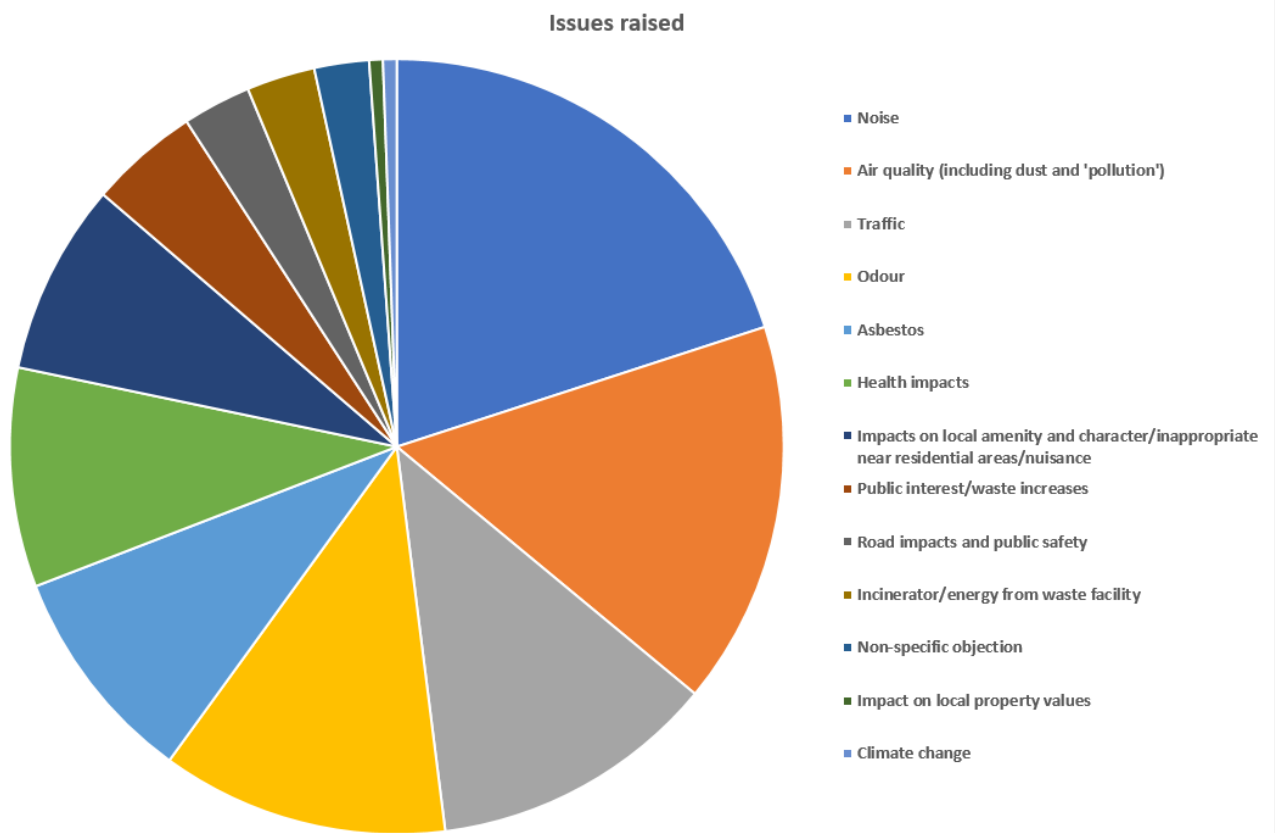


Figure 4.1 Issues raised by number of times raised

5 Response to public authority submissions

Public authorities responding to the exhibited proposal includes local government and State government agencies. A summary of the matters raised by public authorities is provided below in Table 5.1.

Table 5.2 provides a full record of comments received from public authorities, including local Councils, and responses to those comments. Note that public authorities responding with 'nil comments' are not included in Table 5.2. The comments received from the Department of Planning, Industry and Environment (DPIE) and the responses to those comments are detailed in Table 5.3.

Table 5.1 **Summary of aspects raised**

Agency	Summary of aspects raised
Blacktown City Council	Final landfill levels Landfill lifespan Approved waste streams Traffic movements Noise impact assessment Ongoing consultation
Endeavour Energy	Surrounding land uses Air quality (dust)
Environment Protection Authority (EPA)	Noise and vibration Air quality Lighting Leachate
Department of Planning, Industry and Environment (DPIE)	Status of other landfill facilities Landfill lifespan Traffic, parking and haul routes Employment Noise impact assessment Air quality
Fire and Rescue NSW (FRNSW)	FRNSW raised no objections or aspects for consideration.
Office of Environment and Heritage (OEH)	OEH raised no objections or aspects for consideration.
Penrith City Council	Regulatory compliance Consultation
Roads and Maritime Services (RMS)	Car parking spaces Traffic movements
Sydney Water	Sydney Water raised no objections or aspects for consideration.
Transport for NSW (TfNSW)	TfNSW raised no objections or aspects for consideration.
TransGrid	Design considerations

Table 5.2 **Public authority matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
Blacktown City Council	Require confirmation that final landfill levels will be maintained.	Yes. There is no change proposed to the final landform or topography at the point of closure for the landfill void (ie the final 'level' of the filled void).	3
	Provide information regarding the lifespan of the landfill operations as a result of the proposed increase to the annual landfill limit.	This modification aims to optimise the important role the facility plays in managing Sydney's waste and generating beneficial recycled products for re-use in other development. In simple terms, if the rate of waste input to the landfill increases, the lifespan of the landfill will reduce proportionally. This is because the total volume of landfill void which is available to be filled (airspace) will not change as a result of this proposed modification. The void remaining at the facility was (at July 2018) 9,631,070 cubic metres. Based on a current 'business as usual' scenario for current waste volumes, types and densities received at the facility, there is approximately 17 years of available landfilling capacity. If we assumed that demand for waste processing was to immediately rise to the full 2M tpa gate limit, and that of that 2M tpa there was a full demand for all of the 1M tpa 'direct-to-landfill' waste, and assuming a 30% waste by-product that also required landfilling from the MPC, then the remaining lifespan of the void would be nine years. It is important to note however that there is not a pent-up waste disposal demand which would immediately give rise to this scenario and it represents an extremely unlikely outcome. The more feasible scenario is that the rate of filling would rise slowly in response to the fluctuations in development and infrastructure activity, and that the actual lifespan of the void would be somewhere in between those two scenarios. The landfill capacity is not altered by the proposed modification but the rate at which the void is consumed by landfilling may vary, and this is dictated by demand. The lifespan of the void under the proposed modification is therefore somewhere in the range of nine to seventeen years. It is also worth noting that any shortening of the landfill lifespan as a result of the proposed modification will have positive benefits in terms of bringing forward the closure and rehabilitation of the landfill, and cessation of any operational impacts associated with landfilling activities.	3
	Provide confirmation that the approved waste streams are not altered.	There is no change proposed to the approved waste streams under EPL13426. The facility will therefore continue to receive construction and demolition waste, commercial and industrial waste, waste streams complying with acceptable waste for general solid waste (non-putrescible) facilities, special waste (asbestos) and green waste.	3

Table 5.2 **Public authority matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Require detailed consideration of changes to traffic movements and volumes as a result of increased annual landfill limit.	The facility has approval to receive 2M tpa at the gate. This will not be altered and it remains the main factor influencing volumes and vehicle movements. A detailed assessment of traffic impacts is provided in Appendix F of the Modification 6 Environmental Assessment report and summarised in Section 7.5. It is noted that the original Traffic Impact Assessment (Transport and Traffic Planning Associates, 2008) prepared to support the Environmental Assessment for the Genesis Waste Management Facility proposal (06_0139) assessed the traffic that would be generated due to the receipt of 2M tpa of waste to the facility. The proposed modification does not propose to change the total throughput of the facility. The current limit to annual direct-to-landfill waste received at the facility is 700,000 tpa, with the remaining 1.3M tpa currently being recycled or reprocessed. Landfill operations have the potential to generate fewer vehicle movements than recycling activities. This is because in addition to vehicles dropping off waste for recycling, additional vehicle trips are generated by recycled materials being collected for use or further recycling elsewhere. Increasing the proportion of the total 2Mtpa throughput that will be landfill may therefore result in reduced total vehicle movements. Notwithstanding this, the modification will result in an altered distribution of vehicle movements as a result of the proposed changes to operational hours. As noted in Section 4.1 of the Traffic Impact Assessment (TIA) (Appendix F of the Modification 6 Environmental Assessment) the modification may result in an additional 492 truck movements during the evening and night-time periods. The impact associated with the change in traffic distribution into the night-time period is described in Section 4 of the TIA.	7.5
	A detailed noise impact assessment needs to be provided based on current noise readings and the proposed activities	An updated Noise and Vibration Impact Assessment report is provided as an Addendum to this report. The noise assessment provides a comprehensive assessment of truck idling and reversing beepers, the enclosed unloading area, new plant and equipment and designated truck routes. Importantly, site noise emissions during proposed operations are predicted to comply with the relevant PSNLs at all assessment locations considered as part of this assessment. In addition, current and future noise levels are predicted to be significantly less than existing ambient noise levels at the residential assessment locations which are primarily dictated by road traffic noise from the M4 motorway. Hence, noise levels from the modification are not expected to cause adverse impacts at any assessment location.	Appendix B

Table 5.2 Public authority matters raised and relevant responses

Public authority	Matter raised	Response	Mod 6 EA section
		It is important to note that the existing noise limits specified in the site's project approval and EPLs are below measured ambient noise levels at the nearest assessment locations. Further, during the site's bi-annual attended noise monitoring, the site's contribution is regularly unable to be quantified due to elevated ambient noise levels at the specified monitoring locations. As presented in Section 7.2 of the modification 6 Environmental Assessment report it is recommended that the site's noise limits be increased, in line with the highest predicted noise levels or PSNLs adopted for this assessment.	
	Request opportunity to review any additional material and provide a response.	Noted.	NA
Penrith City Council	Ensure that the proposed modification and resulting operation complies with all applicable regulations.	The proposed modification and operation of the facility will remain subject to all relevant regulations and policies.	5
	Ensure that EPA is consulted as relevant licensing authority.	As noted in Section 6.2 of the Modification 6 Assessment Report and Section 2.3 of this EIS consultation has been undertaken with the EPA during the preparation of the modification. Any required amendments to the site's EPLs will be proposed in consultation with the EPA.	5
EPA	<i>Noise and vibration</i>		
	The predicted levels for the approved operations exceed the current noise limits, both those in the project approval (06_0139) and in both of the Environment Protection Licences (EPLs) for the Facility. The daytime limit for noise from landfill and the RRF [resource recovery facilities], at any residence in Minchinbury, is 37dBA in the project approval. However, predicted noise levels at assessment locations 1 to 8, in Minchinbury (Table 5.2) of the NVIA, are from 43dBA under calm conditions and up to 47dBA for noise-enhancing conditions. There does	An updated Noise and Vibration Impact Assessment report is provided as an Addendum to this report. It is important to note that the existing noise limits specified in the site's project approval and EPLs are below measured ambient noise levels at the nearest assessment locations. Further, during the site's bi-annual attended noise monitoring, the site's contribution is regularly unable to be quantified due to elevated ambient noise levels at the specified monitoring locations. As presented in Section 7.2 of the Modification 6 Environmental Assessment report it is recommended that the site's noise limits be increased, in line with the highest predicted noise levels or PSNLs adopted for this assessment. EMM has established Project Specific Noise Levels (PSNL) in accordance with the INP. Operational levels are not predicted to exceed the PSNL i.e. operational noise levels are not predicted to generate intrusive noise impacts.	7.2

Table 5.2 Public authority matters raised and relevant responses

Public authority	Matter raised	Response	Mod 6 EA section
	not appear to be an explanation for why noise from approved operations is up to 10dB above the approval limit. The EPA requests DPIE to advise whether the NVIA needs to be revised or the Applicant seeks to modify their approval noise limits.		
	Approval is being sought for 24-hour maintenance (including repairs) of machinery that appears to include crushers, screens and conveyors. In the EPA's experience this is likely to include generation of noise from equipment such as hammers, drills, generators, lighting plant and grinders. However, there is no assessment of this, or explanation of why there is no assessment, particularly in relation to the potential for sleep disturbance.	Refer to Section 5.4 of revised noise impact assessment report which is provided as an Addendum document to this report. As noted in Section 5.4 of the revised noise impact assessment report noise modelling predicts that L_{Amax} noise levels will satisfy the INP sleep disturbance screening criteria at all residential assessment locations.	Appendix B
	Plant and vehicles proposed to access and work in the premises at night are likely to use tonal movement alarms ("reversing beepers"). EPA's experience is that these alarms are highly audible and can generate an impact at large distances at night-time. This has not been assessed in the NVIA, nor have alternatives been proposed.	Refer to Section 5.4 of revised noise impact assessment report which is provided as an Addendum document to this report. As noted in Section 5.4 of the revised noise impact assessment report noise modelling predicts that L_{Amax} noise levels will satisfy the INP sleep disturbance screening criteria at all residential assessment locations.	Appendix B
	The assessment includes sound power levels for the MPC and the crusher/screen/stacker/excavator derived from measurements at the Facility. However, the assessment then relies on sound power levels from a database for a dozer, front end loader, compactor and conveyor. It is unclear why the levels of all plant and equipment were not measured while they were operating on the Facility. This is of	Refer to Section 5.1.1 of the revised noise impact assessment report which is provided as an Addendum document to this report. The updated noise and vibration impact assessment report provided as an Addendum to this report summarises the operational noise sources and associated sound power levels used in the noise model. The equipment items and quantities are based on the current equipment inventory provided by the Proponent. Sound power levels were based on attended measurements at the site where possible. The sound power levels of plant and equipment that were unable to be measured during the site visit were sourced from an extensive EMM database of similar equipment. These types of plant and equipment have been measured	App'x B

Table 5.2 **Public authority matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	particular concern given the predicted non-compliance of current operations with noise limits.	numerous times and the appropriate sound power levels of these items are widely recognised and acknowledged in numerous publications. Section 6.1 of the INP also allows for the situation where project-related noise source data cannot be sourced from direct measurements stating that noise data could also be sourced, for example, from previous Environmental Impact Statements or manufacturer's data.	
	Several errors were identified in the NVIA: The statement in Section 3.4.3 that "All assessment locations are at a similar or higher elevation than the subject site." Topographic mapping places the site between about the 70 and 80m AHD contours. The most elevated residential receiver locations, to the north, are on the 70m AHD contour; residences to the west are on the 50m contour. Drainage winds therefore do need to be addressed. Statements in Section 2.3.2 that: - daytime is defined as certain hours in EPL 13426. Operating hours are specified in EPL 13426 – they are daytime hours therefore there is no definition of daytime in EPL 13426; and - "...noise limits in the approval are inconsistent with those in the EPLs. Given that the Department of Planning and Environment (DP&E) is the approval authority, its consent should supersede the EPLs". EPA is the regulatory authority and its EPL conditions can vary from DP&Es consent conditions after the first licence review period.	Wording has been corrected – refer Sections 2.3.2 and 3.4.3 of the revised noise impact assessment report which is provided as an Addendum to this report.	Appendix B
	Require the most recent noise and vibration assessment to be provided, and to ensure that issues previously raised are addressed.	Refer revised noise impact assessment report.	Appendix B

Table 5.2 **Public authority matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	<i>Air quality</i>		
	Meteorological year not demonstrated to be representative.	This comment relates to EPA's review of the original Air Quality Impact Assessment (AQIA), dated September 2017 – Appendix C to the Environmental Assessment. It was addressed in the revised AQIA, dated August 2018, and confirmed by EPA that it has been adequately addressed in their letter to DPE dated 15 November 2018. Therefore, no further response is needed.	7.3
	CALMET meteorological data file not validated	EPA's letter to DPIE dated 15 November 2018 required that the CALMET predicted data at the Prospect meteorological station be compared with the observations at the Prospect meteorological site. To address this comment, CALMET performance is evaluated against statistical benchmarks / ideal scores for a number of statistical tests. It is noted that performance benchmarks for bias and error are not intended as necessarily a pass / fail grading system, rather to put the model's results in context with other models and meteorological data sets. The results of the statistical evaluation are shown in Appendix A to this report (Table A.1). Both wind speed and temperature show high correlation (>0.8) for Pearsons correlation coefficient and index of agreement (IOA). Similarly, the fraction of predictions within a factor of 2 (FAC2) are high for both (<0.8). Wind direction does not meet the benchmark for bias or error, however it achieves a high score for FAC2 (0.8) and achieves moderate correlation and IOA (0.6). The measured wind direction at Prospect displays a dominant north-northwest and southwest, whereas the CALMET predicted wind directions shift slightly to north-northeast and west (Figure A-1 in Appendix A to this report). The slight shift in wind direction is likely a result of the model's treatment of the Prospect Reservoir located to the south, both in terms of the influence the water body and the slightly elevated terrain. Notwithstanding, the model performance is considered to be adequate for assessment, based on meeting the majority of the statistical performance benchmarks evaluated.	7.3
	Peak emissions were not considered	The revised AQIA, dated August 2018 – provided as an Addendum to this report - accounted for peak emissions associated with the MPC. The EPA letter to DPIE dated 15 November 2018, noted that this has been adequately addressed. A subsequent letter to DPIE from EPA, following matters raised by Allens Linklater on behalf of Jacfin Pty Ltd, also confirms that the concerns regarding peak daily emissions have been adequately addressed.	7.3

Table 5.2 Public authority matters raised and relevant responses

Public authority	Matter raised	Response	Mod 6 EA section																																								
	The Applicant must present: Peak daily impacts associated with the landfill and MPC operating concurrently; The predicted impacts associated with peak daily and annual production emissions. In particular the predicted impacts from the landfill and MPC operations at peak daily emissions concurrently.	The modelled scenario of 1M tpa <u>does</u> account for potential peak daily emissions from landfilling and MPC concurrently. There are three limits which need to be considered. The gate limit of 2M tpa; the landfilling limit of 700,000 tpa currently and proposed to be increased to 1M tpa; and a practical limit of what the MPC plant can process. The emissions presented in Table 6-1 of the AQIA are based on an annual production rate of 1M tpa for the MPC, which equates to an average daily processing rate of 2,740 tonnes per day (tpd) or 114 tonnes per hour (tph). When waste separation is optimal, the maximum processing rate is 150 tph; therefore, to account for a theoretical worst-case day, the emissions from the MPC are increased by approximately 30% (i.e. 150/114). This, combined with a maximum of 1,000,000 tpa directed to landfill, provides a worst-case assessment for peak day operations. The incoming material (or waste) quantities used to develop the emission inventory are shown below. <table border="1"> <thead> <tr> <th>ID</th><th>Material</th><th>Amount (tpa)</th><th>Details</th></tr> </thead> <tbody> <tr> <td>A</td><td>Total Incoming</td><td>2,000,000</td><td></td></tr> <tr> <td>B</td><td>Direct haul to landfill</td><td>1,000,000</td><td>50% of A</td></tr> <tr> <td>C</td><td>Comingled and Segregated material</td><td>1,000,000</td><td>50% of A</td></tr> <tr> <td>D</td><td>Segregated waste</td><td>200,000</td><td>20% of C</td></tr> <tr> <td>E</td><td>Comingled waste through MPC</td><td>800,000</td><td>80% of C</td></tr> <tr> <td>F</td><td>Comingled residual to landfill via chute</td><td>240,000</td><td>30% of E</td></tr> <tr> <td>G</td><td>Greenwaste shredding</td><td>80,000</td><td>10% of E</td></tr> <tr> <td>H</td><td>Crushing bricks concrete in Yard</td><td>510,000</td><td>((60% of E) + D)*75%</td></tr> <tr> <td>I</td><td>Screening sand/soil in Yard</td><td>170,000</td><td>((60% of E) + D)*25%</td></tr> </tbody> </table> To account for a worst case scenario for MPC emissions, the 'typical' processing pathways and percentages for a 1M tpa landfill limit (excluding MPC waste) – see table above - were scaled up by 30%. The modelled scenario can be considered to account for potential for peak daily emissions as it involves between 1.25 and 2.5 times the amount of material that would be landfilled on any typical day. It is also clarified that the revised AQIA, dated August 2018, presents 24-hour average modelling predictions based on peak daily throughput and annual average modelling predictions based on the annual average throughput.	ID	Material	Amount (tpa)	Details	A	Total Incoming	2,000,000		B	Direct haul to landfill	1,000,000	50% of A	C	Comingled and Segregated material	1,000,000	50% of A	D	Segregated waste	200,000	20% of C	E	Comingled waste through MPC	800,000	80% of C	F	Comingled residual to landfill via chute	240,000	30% of E	G	Greenwaste shredding	80,000	10% of E	H	Crushing bricks concrete in Yard	510,000	((60% of E) + D)*75%	I	Screening sand/soil in Yard	170,000	((60% of E) + D)*25%	7.3
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Table 5.2 Public authority matters raised and relevant responses

Public authority	Matter raised	Response	Mod 6 EA section
	Scenarios 1 and 2 may not be indicative or worst-case emissions	This comment relates to EPA's review of the original AQIA, dated September 2017. It was addressed in the revised AQIA, dated August 2018, and confirmed by EPA that no further response is needed, as it is reflected in the previous comment on peak emissions.	Appendix C
	Unclear how some particulate emissions were calculated.	This comment relates to EPA's review of the original AQIA, dated September 2017. It was addressed in the revised AQIA, dated August 2018, and confirmed by EPA that it has been adequately addressed in their letter to DPIE dated 15 November 2018. Therefore, no further response is needed.	Appendix C
	Not clear how composting has been accounted for in calculating odour emissions.	This comment relates to EPA's review of the original AQIA, dated September 2017. It was addressed in the revised AQIA, dated August 2018, and confirmed by EPA that it has been adequately addressed in their letter to DPIE dated 15 November 2018. Therefore, no further response is needed.	Appendix C
	Ground level PM₁₀ and PM_{2.5} concentrations are significant at nearby industrial receptors. The Applicant should: Detail the current and proposed mitigation measures; Where exceedances of the impact assessment criteria are predicted, the assessment should be revised to include additional pollution control strategies. Consideration needs to be given to the assessment of peak daily landfill operations, as advised in issue 3 [re peak emissions]	All existing mitigation measures are listed in Section 6 of the AQIA – Appendix C to the Environmental Assessment. These mitigation measures represent best practice dust controls and all reasonable and feasible measures that would be adopted/continued for the Modification. Also as discussed above, the emission scenario does account for peak daily emissions from the concurrent operation of the landfill and MPC. The modelling predictions in the revised AQIA demonstrate that, provided mitigation measures are employed, the Modification would generally comply with impact assessment criteria at adjacent industrial receptors. There was a single predicted exceedance of the 24-hour PM_{2.5} criterion, on a day when background was already elevated, and therefore the risk of additional exceedances was concluded to be low. Notwithstanding, and as provided for in the Environmental Assessment (section 7.3.5), the Applicant commits to relocating their real-time monitoring station to a boundary location adjacent to the neighbouring industrial receptors, such that reactive management measures can be used to minimise the potential for adverse impacts from site operations. It is not possible to account for these reactive measures in the modelling and present revised results to demonstrate their effectiveness. However, the Applicant would review and update the site's Air Quality Management Plan to document suitable reactive measures and the monitoring-based triggers used to initiate these reactive measures, based on a combination of: • meteorological forecasts to predict when the risk of dust emissions may be high (due to adverse weather) and allow procedures and preparatory measures to be implemented; • visual monitoring to provide an effective mechanism for proactive control of dust at source, before it leaves the site; and	Appendix C

Table 5.2 **Public authority matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
		real-time air quality monitoring to provide alerts when short-term dust levels increase, to allow management of the location and intensity of activities or increase controls.	
	Results of TSP and dust deposition data for Scenario 2 not given.	This comment relates to EPA's review of the original AQIA, dated September 2017. It was addressed in the revised AQIA, dated August 2018, and confirmed by EPA that it has been adequately addressed in their letter to DPIE dated 15 November 2018. Therefore, no further response is needed.	Appendix C
	Concentration isopleths should be provided.	This comment relates to EPA's review of the original AQIA, dated September 2017. It was addressed in the revised AQIA, dated August 2018, and confirmed by EPA that it has been adequately addressed in their letter to DPIE dated 15 November 2018. Therefore, no further response is needed.	Appendix C
	Clarity be sort on the predicted dust deposition impacts noting the difference between tabulated deposited dust predictions and the isopleth in Appendix C.	The TSP contour was inadvertently included in the place holder for dust deposition. The correct dust deposition contour is shown in Appendix A of this report (Figure A-2).	7.3
	<i>Lighting</i>		
	The EPA is concerned that lights used in internal and external operations areas during the proposed increased operational hours will negatively impact nearby receivers, in particular, those approximately 370m to the north and 1.1km to the west of the facility. The Applicant was requested to demonstrate that lighting levels in all operational areas at the facility will meet the requirements of the relevant EPA guidelines. The facility is elevated to the surrounding environment and surrounded by 10m berms. The lighting requirements for internal traffic in the MPC and the landfill will impact nearby residential receivers both directly and indirectly. The lighting	As noted in Table 7.15 of the Modification 6 Environmental Assessment, and acknowledged by DPIE, the lighting at the facility is mostly concealed from far-field views by the berms that surround the site from the former quarry operation. It is noted that the recycling facility already currently operates until 10:00pm at night and has associated lighting, but that there is a considerable distance from the MPC to the nearest residential receptors. An important consideration is the type of lighting used in outdoor settings at the facility. Contrary to the assumption that lighting would need to reproduce 'daylight' conditions for outdoor operations such as landfilling, the optimal arrangement is to have low intensity lighting which provides sufficient illumination to operate safely, and no more. Internal lighting will be 'daylight' level but this is within an enclosed setting. The issue with high intensity night time lighting outdoors is that it can create glare or shine directly into the eyes of operators and drivers, and the preference is for a more even spread of low light rather than pockets of high intensity light and relative darkness elsewhere. It takes a human eye approximately five minutes to fully adjust between bright daylight and darkness.	7.6

Table 5.2 Public authority matters raised and relevant responses

Public authority	Matter raised	Response	Mod 6 EA section
	required to manage the recycling processes and the inspection of unloaded materials in the drop-off areas will require lighting comparable to daylight luminescence. The Applicant has not provided any information regarding the “likely changes required” and the potential for impacts to residential receivers. In addition, the noise assessment report details transport routes including haul roads that appear to be located on the outside of the amenity berms. This is an elevated area and would appear to directly impact residential receivers from both permanent lighting and internal vehicle movements.	The operation of equipment within the landfill void is approximately 70m below the surrounding topography within the site and the potential light receptors are located approximately 20m below the general elevation of the site. Low intensity lighting is unlikely to create any light spill issues for residential areas.	
	<i>Leachate</i>		
	The Leachate Management Plan has been developed with inputs developed from the scoping study commissioned in 2008. The modelling does not show any of the actual volumes of leachate that are currently treated and disposed of to Trade Waste. The modelling shows that the Trade Waste is capable of handling up to 237,250m3 per year or 650 KL per day. The EPA requires evidence of current leachate volumes that are treated and diverted to Trade Waste.	The most recent data of leachate discharged from the site provided to Consulting Earth Scientists (CES) by the Applicant are presented in Appendix B1 to this report. These records indicate that annual volume of discharge recorded between 20 March 2018 and 20 March 2019 is approximately 29,017.27 kilolitres (KL). This volume is well below the annual capacity of 237,250 m3. Furthermore, the maximum daily discharge volume recorded for this 12-month period is 182 KL, which is well below the 650 KL daily limit.	7.4
	A comparison of aerial imagery of the landfill void walls indicates that the void walls have been modified and excavated in the last few years after the original studies were completed. This has created more surface area in the void and on the void walls and may not be representative of the modelling and	A review of the previous water balance undertaken for the site (Ref: CES161004-ECS-AD, dated 15 November 2016) was undertaken by CES in December 2018 to update the relevant assumptions used in the water balance prepared in 2016. It is stated in this review that there are no changes in landfill geometry; effects of landfilling operations have raised the base of the landfill, however, the same area is exposed to rainfall and the same area is exposed to irrigation operations undertaken by Dial A Dump Industries Pty Ltd (DADI) at the time of the review.	7.4

Table 5.2 Public authority matters raised and relevant responses

Public authority	Matter raised	Response	Mod 6 EA section
	assumptions of estimated leachate volumes from the 2008 study.		
	Require the most recent leachate generation report to be provided, and to ensure that issues previously raised are addressed	The most recent leachate generation report prepared by CES, MOD 6 Leachate Generation Report (CES Document Reference: CES170514-EMM-AC, dated 14 August 2017), is presented in Appendix B2 of this report.	7.4
Endeavour Energy	Require surrounding land use description to recognise Endeavour Energy's North Eastern Creek Zone Substation.	This facility is noted as an element in the surrounding land use. Note that the modification would not result in any land use changes and therefore would not result in any additional operational impacts to this infrastructure.	2.3
	Require consideration of dust emissions on substation (equipment and plant, not people)	The dust deposition contours (see Figure A-2 in Appendix A to this report) show the predicted levels for all areas around the site and can be reviewed to determine impacts on specific areas of concern (i.e. offsite plant and equipment). The nuisance-based criteria contained in the AQIA (Appendix C of the Modification 6 Environmental Assessment) would be a suitable benchmark to assess potential impacts. None are anticipated for the substation.	7.3
	Ensure dust controls are implemented, adhered to and monitored for effectiveness.	The current dust controls implemented on site will continue, including use of sprinkler/misting systems in the MPC and a water cart for dust suppression on internal haul roads.	7.3
RMS	Require that layout of car parking areas should be in accordance with Australian standards for heavy vehicle use. Parking restrictions may be required to maintain sight lines at driveway.	Any specific truck parking (rather than 'car parking') areas will comply with Australian standards. Most arriving or departing trucks will not need to park on the site. Safety of the primary access route via Wonderland Drive, Honeycomb Drive and Kangaroo Avenue is very good as it has been constructed to a high design standard and the current speed limit is 50 km/hr. All the existing intersections along these routes have been well designed and have adequate sight distances for the prevailing speed limit. The relevant authority for the control of on-street parking is Blacktown City Council. Council will be contacted to determine whether parking restrictions are required to maintain good sight lines. As noted in Section 7.5.1 of the Modification 6 Assessment Report the proposed modification has been assessed in accordance with the requirements of the Australian Standards (AS 2890) for access and car parking for cars and heavy vehicles.	7.5
	Require all vehicles to enter and leave the site in a forward direction.	Agreed. All vehicles will be required to exit in a forward direction.	7.5

Table 5.2 **Public authority matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
TransGrid	Ensure that metal fence near the utility easement should be properly earthed	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA
	Ensure access for TransGrid maintenance works during construction and operation	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA
	Ensure access for TransGrid is to a standard suitable for 40 tonne trucks	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA
	Ensure subsoil stability and surface drainage is not adversely impacted near TransGrid structures	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA
	Ensure no placement of obstructions which will restrict TransGrid access	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA
	The easement is not to be used for temporary storage of construction materials	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA
	Ensure safe clearance distances near power lines	This matter appears to be in response to Modification 7 (rather than Modification 6). Modification 7 has been withdrawn.	NA

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
DPIE	Require details regarding closure of other landfill facilities.	A recent analysis completed for Bingo by MRA Consulting, indicates a number of likely landfill closures. The findings of this analysis are presented in Section 1.6 of this report.	1.1.2
	Provide details of how the modification will impact the life expectancy of the landfill.	In simple terms, if the rate of waste input to the landfill increases, the lifespan of the landfill will reduce proportionally. This is because the total volume of landfill void which is available to be filled (airspace) will not change as a result of this proposed modification. The other two variables which will affect lifespan are: - The rate of input of residuals from the MPC recovery process, which is proposed to be excluded from the annual landfill limit. MPC residuals are typically lightweight and consume more landfill airspace (on a per tonne basis) than most unprocessed, direct-to-landfill streams. - Average density of the waste. The current direct-to-landfill waste is predominantly heavy streams such as asbestos soils and general non-putrescible waste. There are light (low density) streams such as shredder flock and residuals from recycling as noted above. It is difficult to predict the future waste mix as this will be driven by market demand, but if there is an increase in the proportion of light materials and a reduction in the overall average density of waste to landfill, then landfill airspace will be consumed more quickly for a given input tonnage. The expected shortening of the landfill lifespan as a result of the proposed modification will have positive benefits in terms of bringing forward the closure and rehabilitation of the landfill, and cessation of operational impacts associated with landfilling activities.	3
	Require traffic impact assessment to reflect a 1M tpa limit for direct-to-landfill disposal.	It is acknowledged that the traffic impact assessment (Appendix F of the Modification 6 Environmental Assessment) incorrectly states that the landfilling limit would be removed within the 2Mtpa total facility limit. This represents a typographical error only, and the assessment presented in the traffic impact assessment has considered the 1Mtpa increase in direct-to-landfill activities.	7.5

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Provide explanation of how the number of future truck movements have been calculated.	The calculated future truck movements presented in the Traffic Impact Assessment (Appendix F of the Modification 6 Environmental Assessment) reflect the scenario of a 2Mtpa ‘gate limit’ for the overall Genesis Waste Management Facility, with a 1M tpa landfill limit. The key variable which influences the number of truck movements is the ‘gate limit’ of 2M tpa. Within that limit – which is not being modified – an increase in the landfill limit will allow more landfilling from two sources – the direct-to-landfill waste arriving by trucks; and the residual waste from the materials processing centre (MPC). If MPC by-product is bundled with direct-to-landfill waste as a form of landfill, then the extent to which recycling or direct-to-landfill is accepted at the facility is determined by the operational decisions of the waste facility operator. For example, the operator may prefer to limit the receipt of mixed recyclable waste in order to preserve space within the landfill limit for direct-to-landfill waste; or vice versa. Recycling generates marginally more truck movements because it provides materials for resale and truck movements can therefore be generated by the sale of materials. Unladen trucks will arrive to be loaded with recycled material. If the facility provided no recycling, then there would not be unladen trucks arriving for collect materials. The future truck movements associated with 2M tpa of inbound material was modelled with a recognition that there is a limit in terms of system capacity at the facility – mostly the capacity of the processing plant and the extent to which truck queuing can be accommodated. This results in a displacement of demand either side of the current peak operating patterns, meaning that some trucks will arrive earlier or later than they currently do. We do expect that, as is currently the case, most demand will occur between 7:00am and 4:00pm (based on current weighbridge data) but there is likely to be some ‘peak spreading’ as drivers and the generators of waste, such as the construction industry, modify their operations to avoid the constraints of the normal peak period. The number of movements assumed to occur at night is therefore based on the principle of ‘peak spread’ which causes the displacement of vehicle movements to periods outside the normal peak.	7.5

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Provide estimated vehicle movements for weekends.	The weekend truck movements based on an assumed 700,000 tpa being disposed to landfill limit is 398. This would reduce to 370 movements if the direct-to-landfill limit waste increased to 1M tpa. There are two reasons for this: The number of truck movements per tonne is less for 'direct-to-landfill' loads because trucks can carry more tonnage per trip – therefore the proportion of the 2M tpa gate limit for other loads which require more truck movements per tonne, such as the less dense recyclable waste, is reduced. Furthermore, a higher landfill rate results in fewer truck movements because, within an overall gate limit of 2M tpa, a greater proportion of direct-to-landfill waste means a lower proportion of recyclable materials received and processed. If less recyclable material is processed then there is less product available for sale and dispatch, and the availability of recycled material for sale is a generator of separate truck movements. A gate intake limit of 2M tpa therefore sets the overall limit on what comes into the facility, but it is only the non-landfill material (ie waste capable of recycling or reuse) that is received that has the capacity to generate additional outgoing loads. These numbers assume that 85% of movements would occur Monday to Friday, and 15% on weekends.	7.5
	Provide information about the split between types of trucks and number of trucks which both tip waste and pick up materials.	The types of trucks and number of trucks is generally influenced by the purpose of the trip and the materials loaded. The truck types and numbers (based on April 2017 data) are shown at Appendix C to this report. A review of the current vehicle movements associated with the facility found that: • For inbound comingled recyclable material (ie construction waste direct to the MPC) the predominant truck type is bin truck. • For inbound recyclable/reuse material (ie to be processed by crushing and screening and stored on site) the predominant truck type is truck and dog. • For landfill waste, the truck types are more evenly spread with bogie tipper and truck and dog being the main type of truck configuration. It is estimated that 10% of trucks arriving at the facility to dispose of waste will, at the same time, collect recycled materials.	7.5

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Provide rationale for how truck movements per day will increase if the facility limit of 2M tpa is not to be increased.	There is a distinction to be made between the truck movements associated with the current level of actual operational activity ('current truck movements') and the truck movements associated with the latent upper limit of operations (2M tpa) permitted by the development consent for the facility ('approved future truck movements'). Since the 2M tpa gate limit is not increased, the approved future truck movement are also not increased. Current truck movements however will increase until they are constrained by either the landfilling limit or the 2M tpa gate limit. This is because the waste generation trends in Sydney continue to increase, and the transport of that waste to appropriate facilities is also increasing. In short, more truck movements will be needed to deal with the increase in waste generation. The increased truck movements reported within the traffic impact assessment (Appendix F of the Modification 6 Environmental Assessment) refer to an increase in movements compared to current 2016/17 movements, and an increase in movements in the night-time period. These 'increased' movements remain, however, within the total maximum vehicle movements associated with the total 2M tpa facility limit as assessed in the original Traffic Impact Assessment (Traffic and Traffic Planning Associates, 2008) prepared for the facility.	7.5
	Elaborate on how parking demand will be wholly met within the site, including periods of shift turnover.	Parking demand is currently met within the site including shift turnover periods. The proposed extension in hours of operation will, for any given volume of material being processed, spread the demand for parking because the staffing required per unit of waste processing is spread across a longer time period.	7.5

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Provide an estimate of additional job numbers.	The proposed modification will create approximately 10 or more additional roles at the facility. This is derived from the likely need for additional staff to undertake evening shift work but is a difficult matter to forecast accurately because there are many variables which can influence job numbers, such as the mix of waste types to be processed and the level of automation in processing. It should also be clarified that the job numbers are not a comparison to current employment on site. The future employment is a comparison between (a) the facility operating at 2M tpa but with no change to landfill limit or hours of operation; and (b) the facility operating at 2M tpa with a 1M tpa landfill limit and extended hours for various activities. Job numbers will increase under both scenarios relative to today's employment numbers simply due to the increased through-put of materials. Scenario (a) compresses the work within fewer hours whereas Scenario (b) processes the same volume of waste over extended hours. The additional numbers for Scenario (b) are assumed to increase due to the spread of hours, but also reduced somewhat by the increased proportion of waste disposed direct-to-landfill, since the latter requires fewer jobs.	3.5
	Provide traffic analysis of how forecast operational traffic will impact traffic from other local industrial and business operators during their operational hours.	Traffic impacts have been modelled in terms of traffic flow, queuing and congestion on local roads and intersections. These impacts consider the volume, time of day and characteristics of traffic on those roads and intersections, and it needs to be acknowledged that the aggregate traffic issues locally cannot be refined to a point of identifying the respective traffic contribution from, nor the traffic impact on, individual local businesses without detailed data regarding the vehicle movements and times of movement for those businesses. This is not information generally or publicly available. It also needs to be acknowledged that the proposed changes to local roads, particularly the extension to Archbold Road, will bring both benefits and disbenefits to local businesses depending on their location and their transport needs. The best arrangement is to consider the impacts which can be modelled for local traffic in aggregate and accept that the traffic improvements and impacts, if any, will be shared amongst road users regardless of the whether those road users are associated with local businesses or not.	7.5
	Identify night time haul routes.	Haul routes are described in Section 2.1 of the Traffic Impact Assessment (Appendix F of the Modification 6 Environmental Assessment). These routes do not vary materially according to time of day.	7.5

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Confirm whether MPC residual waste is included in the 1M tpa proposed limit for landfill; and on this basis whether the 'worst-case' scenario would be 1.3M tpa being landfilled and 1M tpa recycled through the MPC.	The proposal is to increase the landfill cap to 1M tpa excluding waste generated by recycling processes within the PSE and MPC. It is important to separately account for by-products of recycling processes. This is because the purpose of the landfill limit is to influence greater application of recycling and reuse as waste management methods as opposed to 'direct-to-landfill' methods. Including by-products of recycling within a volume-based limit for landfilling undermines that intended outcome and ignores the influence of market forces which already drive waste processing towards more recycling and reuse. From both a business and environmental perspective, recycling and reuse is preferable. It should not be constrained by a landfill limit which is meant to promote recycling and reuse. In terms of the 'worst-case' scenario, the total amount received on site will remain 2M tpa. If there is 1.3M tpa landfilled (being 1M tpa 'direct-to-landfill' plus 30% of the materials received at the PSE and MPC) then there is a need to avoid 'double counting' the 300,000 tpa that arrives in the landfill via a chute from the MPC. That 300,000 tpa is already counted in the 1M tpa that arrives at the site as either segregated recyclable material or as co-mingled recyclable material. A better way to conceptualise the 'worst case' is to split the 2M tpa gate limit into two streams – direct to landfill waste being 1M tpa and other waste (recycling via PSE, MPC and SMA) being 1M tpa. The 'other' stream then produces a by-product which needs to go to landfill but this is not additional material coming in through the gate. It has already been counted towards the 2M tpa on the inbound truck, and this is simply further processing of material on site. This is acknowledged and adopted for the purposes of modelling within the Air Quality Impact Assessment Report (included as an Addendum to this report) which states "A worst-case emissions assessment is considered based on a 50/50 split between the MPC and landfill" (section 2.2 of the AQIA).	4.1.2
	Confirm whether the monitoring site for PM ₁₀ will be relocated.	The Applicant has – as noted in the Environmental Assessment (section 7.3.5) - agreed to relocating their real-time monitoring station to a boundary location adjacent to the adjacent industrial receptors	7.3

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Provide detail of proposed measures to minimise and mitigate air quality impacts.	• All existing mitigation measures are listed in Section 6.1 of the AQIA (Appendix C to the Environmental Assessment). These mitigation measures represent best practice dust controls and all reasonable and feasible measures that would be adopted/continued for the Modification. The existing mitigation measures are: • Enclosure of material handling and processing and storage within the MPC shed. • Misting sprays operated within the shed to dampen material as it is sorted and before being loaded to the hopper. • The majority of travel routes onsite are sealed (exceptions are the haul route into the pit and within the segregated materials area). • Water sprays on the mobile crusher and shredder. • Fixed water sprays on product storage areas. • Water truck operating on unsealed haul road into the pit, within the landfill and on the paved roads as needed. • Speed limit of 40km/hr for unsealed haul road into the pit. • Water cannon operating within the pit. • Established earth bund along the northern boundary of the pit. • A fixed water spray system operates on the access roadway.	7.3
	Provide further detail on mitigation measures for odour impacts arising from green waste and composting.	A conservative emissions and modelling scenario for odour presented in the AQIA (Appendix C to the Environmental Assessment) predicted no exceedances of the odour goals. Additional mitigation measures are therefore not considered necessary.	7.3
	Ensure consistency between noise impact assessment and the 1M tpa annual limit for landfill.	An updated Noise and Vibration Impact Assessment report is provided as an Addendum to this report. The updated assessment identifies the proposed limit of direct-to-landfill waste of 1Mtpa.	7.2

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Confirm whether MPC residual waste is included in the 1M tpa proposed limit for landfill as is implied in the 50/50 split between landfill and recycling.	The 50/50 split is between the ‘direct -to-landfill’ waste stream (not ‘landfill’ generally) and the waste streams for recycling and reuse. The proposal is to increase the landfill cap to 1M tpa excluding waste generated by recycling processes within the MPC and the Pre-Sort Building (PSB) which are the two stages of sorting materials in the co-mingled waste recycling stream.	4.1.2
	Use more contemporary data (not 2014) to measure background noise levels.	Monitoring was undertaken in March and April 2014. No significant changes have occurred in the area that would be expected to impact ambient noise levels since the noise monitoring was undertaken. Traffic noise may have increased slightly and some increased industrial development in the area may have the effect of increasing ambient noise levels. As such, use of noise levels measured in 2014 to determine intrusive noise goals is considered a conservative approach and suitable for the purpose of this assessment. It is a ‘conservative approach’ because noise impacts are measured against a level of background noise which is lower than the background noise levels which are likely being experienced by residents currently. It might also assist in the reading of the NIA to clarify that when the NIA refers to the ‘removal’ of the current limit of 700,00 tpa, this is not suggesting that the consent should have no limit whatsoever for landfilling, but rather reflecting the proposed removal of the 700,000 tpa limit in favour of its replacement by an alternative limit of 1M tpa.	7.2
	Provide justification of why EMM database and not direct measurement of existing plant and equipment was used for operational noise sources.	Most existing plant noise were measured at site. The updated noise and vibration impact assessment report (provided as an Addendum to this report) summarises the operational noise sources and associated sound power levels used in the noise model. The equipment items and quantities are based on the current equipment inventory provided by the Proponent. Sound power levels were based on attended measurements at the site where possible. The sound power levels of plant and equipment that were unable to be measured during the site visit (for example, where the equipment was not operational at the time) were sourced from an extensive EMM database of similar equipment. These types of plant and equipment have been measured numerous times and the appropriate sound power levels of these items are widely recognised and acknowledged in numerous publications. Section 6.1 of the INP also allows for the situation where project-related noise source data cannot be sourced from direct measurements stating that noise data could also be sourced, for example, from previous Environmental Impact Statements or manufacturer’s data.	7.2

Table 5.3 **DPIE matters raised and relevant responses**

Public authority	Matter raised	Response	Mod 6 EA section
	Provide additional information on proposed measures to minimise, mitigate and monitor noise levels from truck movements during the evening and night period.	Noise emission levels, as presented in Table 5.2 of the NIA, are predicted to be below (i.e. satisfy) the project specific noise levels at all assessment locations. Hence, in accordance with the INP, consideration of additional measures to mitigate noise is not necessary beyond adopting good practices.	7.2

6 Response to community submissions

6.1 Community submissions

As noted, there were 66 submissions from community stakeholders. The approach adopted to respond to these submissions has been to aggregate and respond to the submissions on the basis of issues raised.

The level of detail in the responses varied significantly. For example, some respondents simply nominated an issue (eg “traffic”) while other respondents provided a more detailed response.

In order for community respondents to identify how and where their issue has been considered and addressed, each individual respondent has been identified by a unique number, and this is referenced in the themed responses to issues. It is also noted that where submissions were made via the DPIE website, the DPIE tracking system also allocated a six-digit number to that respondent. Not all community responses we received via the DPIE website, and therefore not all have a DPIE tracking number. The simplified numbering system used for this Response to Submission is provided below in Table 6.1.

Table 6.1 Community submissions reference table

Respondent	Name	Location	DPIE Tracking
1	Dobros, B	Minchinbury	284426
2	Turner, D	St Clair	284749
3	Clark, G	Minchinbury	284416
4	Acevedo, G	Currans Hill	284432
5	Figueira, J	St Clair	284751
6	Gucel, K	Rooty Hill	284420
7	Khan, M	Minchinbury	283648
8	Gucel, P	Rooty Hill	284418
9	Wimberley, S	Banyo, Qld	283911
10	Anon	Minchinbury	284430
11	Anon	Minchinbury	283517
12	Anon	Minchinbury	283506
13	Anon	Seven Hills	284400
14	Anon	Minchinbury	284760
15	Anon	Greystanes	284755
16	Anon	Minchinbury	284434
17	Anon	Minchinbury	284675
18	Anon	Minchinbury	284436
19	Anon	Erskine Park	284747
20	Anon	Minchinbury	284694
21	Briffa, A	Minchinbury	285742
22	Alessio, A	Erskine Park	285921

Table 6.1 **Community submissions reference table**

Respondent	Name	Location	DPIE Tracking
23	Yilmaz, A	Blaxland Rd, NSW	285794
24	Spiteri, C	Minchinbury	285435
25	Nathan, C	Minchinbury	284908
26	Cunich, D	Minchinbury	285343
27	Munzer, D	Minchinbury	284852
28	Smith, D	Minchinbury	285576
29	Brooke, E	Minchinbury	285301
30	Wilson, G	St Clair	284768
31	Bellingham, J	Emu Plains	284836
32	Bradbury, K (also via Blacktown City Council)	Minchinbury	285744
33	Allessio, S	Erskine Park	285919
34	Anon	St Clair	285913
35	Anon	Minchinbury	285542
36	Anon	Minchinbury	285762
37	Anon	Minchinbury	285751
38	Anon	Erskine Park	284999
39	Anon	Erskine Park	284997
40	Anon	Minchinbury	285203
41	Jacfin Pty Ltd	Sydney	285982
42	Eades, J	Minchinbury	286005
43	William, J	Minchinbury	286069
44	Moore, N	Minchinbury	285999
45	Anon	Minchinbury	286074
46	Anon	Minchinbury	286071
47	Anon	Minchinbury	286065
48	Anon	Minchinbury	286063
49	Anon	Minchinbury	286061
50	Anon	Blacktown	286057
51	Anon	Blacktown	286055
52	Anon	Blacktown	286051
53	Anon	Minchinbury	286001
54	Anon	Minchinbury	285997
55	Anon	Minchinbury	285995
56	Anon	Erskine Park	285978
57	Anon	Minchinbury	286049

Table 6.1 **Community submissions reference table**

Respondent	Name	Location	DPIE Tracking
58	Anon	Blacktown	286047
59	Anon	Minchinbury	286045
60	Anon	Minchinbury	286041
61	Casey, A	Minchinbury	N/A
62	Uluc	Minchinbury	N/A
63	Llagas	Rooty Hill	N/A
64	Casey, S	Minchinbury	N/A
65	Partridge, S	Minchinbury	N/A
66	Toothill, V	Minchinbury	N/A

6.1.1 Issues raised by community respondents and response

The main issues raised by community respondents, and the response to those issues by the Applicant, are examined in Table 6.2.

It is noted that several respondents indicated that they found the information “hard to understand”, “conflicting” and “confusing”. In an effort to address some of the inherently complex matters raised by this proposed modification, we have provided relatively lengthy and detailed responses to some of the matters raised by community respondents.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
Noise	3, 7, 9, 10, 11, 12, 16, 17, 18, 20, 21, 22, 28, 30, 31, 32, 33, 34, 40, 41, 43, 44, 46, 49, 54, 55, 56, 57, 61, 62, 63, 64, 65, 66	The majority of comments regarding noise were simply that noise was an issue for local residents.	Refer to the revised noise impact assessment (Addendum to this report) which shows that noise emissions from proposed operations are predicted to meet the relevant goals.
		Noise emanating from trucks and materials processing were highlighted as concerns.	
		The noise impacts of the M4 motorway were noted as an existing acoustic impact on residents in Minchinbury and Erskine Park, particularly at night.	This is agreed and noted. Importantly, it is the character and impact of the ambient noise which informs the basis of the suggestion to recalibrate the prescribed noise thresholds for the facility. If the noise criteria specify an acoustic level which is materially below the ambient noise at residences, then a technical exceedance of that threshold is not meaningful for local residents if it is not detectable above the ambient noise. It is better to set performance criteria which take account of existing soundscapes and which therefore limit actual impacts.
		Night time and early morning was noted as a times of most concern regarding noise	Refer to the revised noise impact assessment (Addendum to the report) which shows that noise emissions from proposed operations are predicted to meet the relevant goals.
		Sleep deprivation was noted as a possible impact and there were comments that noise could cause 'long-term medical conditions'.	Refer to Section 5.4 of revised noise impact assessment report which is provided as an Addendum document to this report. As noted in Section 5.4 of the revised noise impact assessment report noise modelling predicts that L_{Amax} noise levels will satisfy the INP sleep disturbance screening criteria at all residential assessment locations.
		One respondent observed that washing and maintenance of plant at night is inconsistent with other local provisions which prohibit mowing lawns at night	It is noted that Blacktown City Council restricts the use of powered garden tools (including lawn mowers) during the hours of 8:00pm to 7:00am weekdays and Saturdays, and 8:00pm to 8:00am on Sunday. Separate regulatory arrangements are put in place to manage noise at industrial premises. See for example the NSW EPA <i>Noise Policy for Industry</i> (2017).
		Night readings should be at 03:00-04:00 rather than midnight	Determination of night-time noise criteria has considered long-term noise data including that measured between 3.00am and 4.00am.
		Noise impacts do not take account of Modification 7	The application for Modification 7 has been withdrawn.
		The increase in hours of operation should be identified as an additional 13 hours per day	Current approved hours of operation are (for most activities) 7:00am to 6:00pm (Monday to Friday). An increase to operations at the facility for 24 hours does indeed

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			represent an additional 13 hours of operation for those activities, on those days, since 7:00am to 6:00pm represents 11 hours of operation. The maintenance and related activities for the Materials Processing Centre, however, are currently authorised from 7:00am to 10:00pm (Monday to Friday). Other activities have different authorised hours again, and not all activities are proposed to be extended to 24 hours. For example, crushing and screening is proposed to be extended by one hour only. It is therefore appropriate to simply outline the proposal to extend hours for each activity in a table format rather than claim (incorrectly) that there is a generic increase of 13 hours per day for the operation of the facility.
		An increase in noise levels of up to 11dB(A) above current approved levels will have significant impacts on residents, and justification is required as to why current thresholds are inadequate	Current noise limits are set well below those levels that would cause disturbance in the nearest residential areas. E.g. A night-time project specific noise level of 40dB has been determined for Erskine Park and 46dB for Minchinbury whereas the current noise limit is 35dB from the landfill and resource recovery facility. Actual current noise emissions are not increasing, but the predicted levels have been contemporised to current modelling and assessment methodologies.
		Noise impact assessment uses background noise data which is dated 2014. More contemporary data is needed	Monitoring was undertaken in March and April 2014. No significant changes have occurred in the area that would be expected to impact ambient noise levels since the noise monitoring was undertaken. Traffic noise may have increased slightly and some increased industrial development in the area would have the effect of increasing ambient noise levels. As such, use of noise levels measured in 2014 to determine intrusive noise goals is considered a conservative approach and suitable for the purpose of this assessment.
		Background noise data for Erskine Park residential area is not accurate due to extraneous noise sources such as frogs and insects	There is no evidence that the background noise data was affected by extraneous noise.
		The assessment needs to specifically consider low frequency noise	Refer Section 5.1.1 of the NIA (Addendum to this report). Noise sources were examined for the presence of low frequency noise or other characteristics that could cause greater annoyance such as tonality or impulsiveness. Sources typically used at the site did not contain such features and, as such, the application of modifying factors was not considered necessary.
		More explanation required regarding why current operational noise levels exceed levels set by consent and EPL, and need to validate using current noise measurements	It appears that the current noise limits have been established based on minimum noise criteria as per the INP. Given the relatively high ambient noise levels in the nearby residential areas it is likely that noise emissions from current operations would not be

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			audible. As above, the current noise limits are set well below those levels that would cause disturbance.
		Noise goals articulated in Eastern Creek Precinct Plan (Stage 3) are not considered	The Eastern Creek Precinct Plan (Stage 3) is noted as a relevant environmental planning instrument in the Environmental Assessment (section 5.3) and it is also considered in the Noise Impact Assessment Report at Section 4.1.3 of that report. The Precinct Plan states (section 7.8 of the Plan): <i>Given the nature of development within the Precinct, noise generation from the site is to be restricted to a reasonable level. Noise is to be contained where possible and not unreasonably impact on the operations or amenity of adjoining or surrounding sites.</i> The Precinct Plan sets optimum noise criteria for separate ‘zones’ within the precinct. The Genesis facility is in Zone 1. The Zone 1 optimum noise level is 57bBA (day); 47dBA (evening; and 42dBA (night). The Precinct Plan suggests: <i>These goals will provide adequate protection to the noise amenity of residential areas surrounding the Precinct without unduly restricting the operation of development.</i> Importantly, the Precinct Plan stipulates that the development application “must comply with relevant Council and government authority guidelines”. The Precinct Plan describes the optimum noise levels generated within Zone 1 because it anticipates that the impact of those noise levels will provide adequate protection for noise amenity at residential (and industrial) receivers. This is not quite the same as the approach adopted by the “government authority guidelines” which propose noise criteria measured at the residential and industrial receivers, rather than the source of the noise. Although the noise assessment, and the government guidelines on which it is based, are concerned with the measurement of noise at the receiver points (not the source), all of the guiding documents - the Precinct Plan, government guidelines and noise assessment – have the same outcome in mind and are compatible.
		The level of noise for ‘approved operations’ should not be substituted for the level of noise for ‘current operations’	It is agreed there is a need to ensure that the approved (ie latent) operational dimensions of the facility – such as a 2Mtpa gate limit for waste received at the site - is not substituted for the existing (ie actual) operational dimensions. The actual operational dimensions, including noise, are however an appropriate input to the modelling if we are to understand the likely future impacts from those operations. The noise characteristics of (say) a crushing plant will not change simply

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			because there has been a change to the volume of waste which can be sent to landfill. The purpose and the activities of the Eastern Creek site remain those of a waste management and processing facility. The use of the site will not change under the proposed modifications. The matters being modified via this application are the hours of operation and the volume of waste permitted to be landfilled. There are two main points to consider here. Firstly, the processing of waste, whether landfill or recycling, is what generates noise, not the approved limits for those activities under a development consent, and the extent of that activity is largely driven by external market forces such as the scale, type and location of waste generating activities such as building demolition. Secondly, it is appropriate to model approved operations (based on the measurement of noise from current operations) because there is, subject to market demand, regulatory provision for the actual operations to increase to that limit but it will be activity of the same type. The intention is therefore to consider the 'real world' noise environment, including local topography and surrounding development, and apply that to a theoretical future scenario based on approved limits.
Air quality	1, 5, 6, 7, 8, 11, 12, 17, 18, 20, 22, 26, 30, 31, 32, 33, 35, 38, 39, 41, 42, 45, 49, 56, 62, 63	Respondents generally expressed an objection to increased 'pollution' which was taken to refer to air quality impacts. Some respondents expressed a concern for 'toxic chemicals in the air' or 'toxic fumes' although there was no specific source identified, other than 'car tyres'. Some respondents noted that air quality in the region is already poor. It was suggested that the air quality in the local area had already reached 'the national standard'. The air quality concerns were often linked to an anticipated increased volume of waste to be managed at the facility.	The National Environment Protection Measure for Ambient Air sets maximum goals or standards for each pollutant type, and exceedances are recorded. The Office of Environment and Heritage notes that national air quality standards are exceeded from time to time due to ozone levels in urban areas and particle (PM₁₀ and PM_{2.5}) concentrations in urban and regional areas. Data for the Sydney South-West region suggests that air quality exceedances occur on approximately 5 days each year. A number of community respondents indicated some confusion regarding the proposed 'increase' in waste processing, and many also assumed that the modification would allow more waste to be received at the facility. The modification does not propose to increase the existing 2M tpa limit. Rather it seeks to allow a greater proportion of the waste received to be disposed to landfill. There are two operational limits at present – the 'gate limit' of 2M tpa and the landfilling limit of 700,000 tpa.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			Increasing the nominal limit of landfilling to 1M tpa means potentially more landfilling activity but not an increase in the overall amount that can currently be received at the facility (ie the 'gate limit').
		The contribution of trucks to air quality impacts was also raised. A related comment was that residue from diesel emissions is already causing impacts on local residents.	Emissions from diesel trucks and other equipment has been estimated and modelled in the AQIA.
		The modification will cause air quality to exceed the criteria for residential and commercial receptors for cumulative 24 hours average PM _{2.5} concentrations and 24-hour average ground level PM ₁₀ concentrations	No residential receptors are predicted to exceed the impact assessment criteria for 24-hour average PM ₁₀ and PM _{2.5} . There was a single predicted exceedance of the 24-hour PM _{2.5} criterion at an adjacent industrial receptor, on a day when background was already elevated, and therefore the risk of additional exceedances was concluded to be low.
		The increase in landfilling will generate increased dust because landfilling requires truck access to the pit via an unsealed road	Emissions from wheel generated dust for trucks entering the landfill has been estimated and modelled in the AQIA.
		The technical assessment does not model impacts using a realistic 'worst case scenario'	As described above in the response to EPA comments, the modelling scenario presented in the AQIA represents potential peak daily operations.
		The scenario of a 50/50 split (1M tpa each) between direct-to-landfill and recycling/reuse would result in more than 1M tpa being landfilled because the recycling effort could generate its own landfill requirement of around 300,000 tpa	The proposal is to increase the landfill cap to 1M tpa <u>excluding</u> waste generated as a by-product of the recycling processes conducted in the PSE and MPC. In terms of the definition we have adopted to describe the waste streams, the by-product waste from recycling and reuse is not part of the 'direct-to-landfill' waste stream. It is important to separately account for by-products of recycling processes. This is because the purpose of the landfill limit is to influence greater application of recycling and reuse as waste management methods as opposed to 'direct-to-landfill' methods. Including by-products of recycling within a volume-based limit for landfilling undermines that intended outcome and ignores the influence of market forces which already drive waste processing towards more recycling and reuse. From both a business and environmental perspective, recycling and reuse is preferable. It should not be constrained by a landfill limit which, ironically, is meant to promote recycling and reuse. In terms of air quality modelling, the assessment has incorporated incoming material (or waste) quantities as shown below.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment																																								
			<table border="1"> <thead> <tr> <th>ID</th><th>Material</th><th>Amount (tpa)</th><th>Details</th></tr> </thead> <tbody> <tr> <td>A</td><td>Total Incoming</td><td>2,000,000</td><td></td></tr> <tr> <td>B</td><td>Direct haul to landfill</td><td>1,000,000</td><td>50% of A</td></tr> <tr> <td>C</td><td>Comingled and Segregated material</td><td>1,000,000</td><td>50% of A</td></tr> <tr> <td>D</td><td>Segregated waste</td><td>200,000</td><td>20% of C</td></tr> <tr> <td>E</td><td>Comingled waste through MPC</td><td>800,000</td><td>80% of C</td></tr> <tr> <td>F</td><td>Comingled residual to landfill via chute</td><td>240,000</td><td>30% of E</td></tr> <tr> <td>G</td><td>Greenwaste shredding</td><td>80,000</td><td>10% of E</td></tr> <tr> <td>H</td><td>Crushing bricks concrete in Yard</td><td>510,000</td><td>((60% of E) + D)*75%</td></tr> <tr> <td>I</td><td>Screening sand/soil in Yard</td><td>170,000</td><td>((60% of E) + D)*25%</td></tr> </tbody> </table> These are based on typical operations at the facility (in terms of the mix of waste streams) but calibrated to assume a maximum volume of 2M tpa received at the gate. In summary, it is agreed that the 50/50 split will – on an assumed maximum volume received at the gate of 2M tpa and on an assumed 1M tpa of that waste received being ‘direct-to-landfill’ waste – result in more than 1M tpa being landfilled from all sources but not more than 1M tpa of direct-to-landfill waste. The alternative to this proposed arrangement is to cease recycling when the landfill limit is reached; send ‘direct-to-landfill’ waste to alternative landfill facilities; send recyclable waste to other facilities; or a combination of these. Either way, the impacts will be greater because trucks carrying that waste will be forced to travel greater distances, through more suburbs, in search of an appropriate disposal location. If this cost and time burden becomes too great, it may also incentivise illegal dumping locally.	ID	Material	Amount (tpa)	Details	A	Total Incoming	2,000,000		B	Direct haul to landfill	1,000,000	50% of A	C	Comingled and Segregated material	1,000,000	50% of A	D	Segregated waste	200,000	20% of C	E	Comingled waste through MPC	800,000	80% of C	F	Comingled residual to landfill via chute	240,000	30% of E	G	Greenwaste shredding	80,000	10% of E	H	Crushing bricks concrete in Yard	510,000	((60% of E) + D)*75%	I	Screening sand/soil in Yard	170,000	((60% of E) + D)*25%
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I	Screening sand/soil in Yard	170,000	((60% of E) + D)*25%																																								
		There should be consideration of dust generated by the proposed Hanson Concrete and Asphalt facility, to accurately assess cumulative air quality impacts.	Cumulative impacts are assessed by combining the contribution from the Modification with the existing ambient air quality environment, described based on baseline monitoring data for the region. The derived baseline is assumed to account for all existing emissions sources in the local airshed, including the Hanson facility. The standard methodology for deriving background air quality is to take into account all existing and reasonably foreseeable local development. The expansion of the Hanson facility was considered a speculative rather than reasonably foreseeable development and was therefore not modelled for current background air quality purposes.																																								
		The dispersion modelling uses points of reference for commercial and industrial receptors which are not the points of greatest potential impact, and therefore the results are under-estimated.	The points of reference for commercial and industrial receptors are selected based on where exposure to dust may occur, for example building openings, carparks, loading docks etc. The assessment approach is consistent with industry standard.																																								

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
		The air quality assessment does not provide predictions for ground level concentrations of dust and odour at the Jacfin site which represents future employment land.	The concentration and dust deposition contours show the predicted levels for all pollutants across all areas around the site and can be reviewed to determine impacts on specific areas of interest.
		Haul route lengths assumed for unpaved roads do not represent the likely lengths of haulage.	The main impact associated with haul route length is dust generated by truck movements, and this is assumed to be the reason why the haul length on unpaved roads was raised. For dust impacts associated with these matters please refer to the Air Quality section of this document, as the same matters were mentioned in relation to air quality.
		Silt content for paved and unpaved roads are unrealistically low.	No site-specific measurements of silt content or silt loading were available; therefore, the adopted values are taken from the literature. The silt content assumed for unpaved roads (6.4%) is the mean value reported for municipal solid waste landfills in the AP42 emission factor documentation for unpaved roads (chapter 13.2.2). Similarly, the silt loading assumed for paved roads within the site (7.4g/m²) is the mean value reported for municipal solid waste landfills in the AP42 emission factor documentation for paved roads (chapter 13.2.1). The silt loading assumed for the site access road (0.6g/m²) is the ubiquitous baseline value reported for public roads with <500 average daily traffic volumes in the AP42 emission factor documentation for paved roads (chapter 13.2.1). Generally, the values selected are expected to be conservative. For example, silt contents measured for unpaved roads at coal mines in NSW are, on average 4.6%, lower than the value we used.
		Unrealistically high emission control benefits have been assumed	All existing mitigation measures are listed in Section 6 of the AQIA. These mitigation measures represent best practice dust controls and all reasonable and feasible measures that would be adopted/continued for the Modification. The control efficiencies used are based on values reported in the literature.
		There appear to be inaccuracies in the dust deposition rate contour plot at Figure A5-6 of the Air Quality Assessment.	The TSP contour was inadvertently included in the place holder for dust deposition. The correct dust deposition contour is shown in Figure A-2 of Appendix A to this report.
		It was suggested that there was very limited information provided in relation to the odour assessment.	A detailed description of odour emission is provided in Section 6.2 of the AQIA. Modelling predictions for a worst-case odour emissions scenario area presented in Section 7.4.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
		Predicted ground-level concentrations of odour at the Jacfin land probably exceed the criterion for populated areas of 2 OU. The Air Quality Assessment has suggested a criterion of 7 OU applies to commercial activities, however this level is incorrect having regard to the nature of the surrounding development.	The 2 OU contour does not extent across the Jacfin property land. Please refer to Figure A5-7 in Appendix 5 'Contour plots' of the Air Quality Impact Assessment Report.
Traffic	2, 6, 8, 9, 11, 12, 14, 16, 18, 25, 31, 32, 34, 35, 38, 39, 40, 42, 56, 62, 63	Many respondents generically identified traffic as an issue and some suggested that local roads do not cope well with the existing levels of traffic. Most held a view that an increase in the landfilling limit will exacerbate the problem. Some respondents pointed to heavy vehicles as the cause of local road choke points. One respondent stated that there were already risks to children crossing roads and that additional traffic would increase that risk. One respondent suggested that ambulance and police vehicles have difficulty accessing local streets already.	The pattern of traffic movement associated with the Eastern Creek facility will have a diminished (ie diluted effect) the greater the distance from the facility. This is because the vehicle journey origins (for inbound) and destinations (for outbound) can be in a myriad of locations. It is likely that the traffic closer to the facility, whether inbound or outbound, will focus on a small number of roads. The key feeder roads for the facility will be Archbold Road, the Great Western Highway, Western Motorway, Old Wallgrove Road and Wallgrove Road. Lesser volumes will use routes such as Rooty Hill Road South, The Horsey Drive, Rupertswood Road and Carlisle Avenue. The main routes are not considered to represent a safety risk as there are adequate signalised crossing points. With the vast majority of traffic associated with the site travelling via routes such as the Western Motorway, the Great Western Highway, Wallgrove Road and Archbold Road, these are multi-lane main roads capable of supporting heavy vehicle traffic without disruption to local streets.
		It was suggested that when the Archbold Road extension is built, the trucks will use this as a short cut to the facility.	Archbold Road currently exists as a formed road from the Great Western Highway as far south as Sargents Road. Infrastructure, including an overpass crossing for the Western Motorway, is in place already. The extension of Archbold Road south of the Western Motorway has been a long-term plan for traffic management, and this includes traffic associated with the industrial precinct at and adjoining the Eastern Creek waste management facility. Most inbound vehicles delivering materials to the site from the north and west will enter Archbold Road at the intersection with the Great Western Highway and continue on the extended section of Archbold Road to approach the site.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			This is not a 'short cut' in the sense of an unintended 'rat run' but rather as a route most suitable for the forecast traffic.
		It was suggested that Wallgrove Road should be upgraded and that Grevillea Street should be 'opened up'. It was also suggested that an additional road be constructed	Grevillea Street is a 470m length of road, ending in a cul-de-sac. It is unlikely to be used by any of the vehicles associated with the Genesis facility. Wallgrove Road is approved by Roads and Maritime Services as suitable for 25m B-double vehicles.
Odour	2, 3, 7, 14, 16, 18, 19, 21, 25, 28, 29, 30, 31, 34, 35, 38, 39, 41, 42, 42, 62	There were several submissions which nominated odour or smell generically as an issue of concern because of the 'proposed expansion of the facility'. Several respondents stated that they could "smell the tip" from their homes on most days. Some respondents indicated that odour was worse at night time and caused discomfort. Others suggested that the odour was worst on hot mornings. It was suggested that odour issues may be more problematic during summer months.	The changes proposed under Modification 6 do not propose to expand the facility or change the type of waste currently authorised to be received at the site. The overall gate limit of 2M tpa remains unchanged. The classification of waste remains unchanged. The Modification seeks to increase the proportion of that overall limit which can be disposed to landfill and to increase the hours of operation for the facility. The facility has remained compliant with the relevant environment protection licence (EPL #13426) which requires "an annual audit of the design, operation and odour management practices of the operation with the primary aim of identifying improvements that lead to attainment of best practice in regard to minimising odour emitted from the premises". The EPA regulates odour impact via the EPL and, as a condition of the EPL, the EPA can require Genesis to conduct assessments or investigations that identify the extent of any potentially offensive odour emissions beyond the boundary of the premises. The air quality assessment prepared by Ramboll (Appendix C to the Environmental Assessment) found that the worst-case potential odour impact from landfilling at 1M tpa combined with green waste processing and composting, would not result in exceedances of the odour goal of 2 OU at any residential receptor. The contour lines for odour impact are found in Appendix 5 'Contour plots' of the Air Quality Impact Assessment Report (see specifically Figure A5-7).
		It was suggested that there needs to be a 'down time' when odour is able to disperse.	A conservative emissions and modelling scenario for odour presented in the AQIA predicted no exceedances of the odour goals. Therefore, additional mitigation measures are not considered necessary, including downtime.
		One respondent suggested that odour emissions will stifle employment generating development on adjoining land.	A conservative emissions and modelling scenario for odour presented in the AQIA predicted no exceedances of the odour goals.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
		One respondent suggested that the receptor locations used for modelling odour impacts are not the points of greatest exposure to odour, and that the modelling in the assessment report under-represents the impact. Specifically, the Jacfin site was mentioned.	A conservative emissions and modelling scenario for odour presented in the AQIA predicted no exceedances of the odour goals. The 2 OU contour does not extent across the Jacfin property land.
		Odour impacts were said to be under-estimated due to: (i) haul route lengths on unpaved roads assumed do not represent the likely lengths of haulage given the proposed scope of operations if approval is given to the Modification Application; (ii) silt content for paved and unpaved roads are unrealistically low; and (iii) unrealistically high emission control benefits have been assumed.	Haul route lengths and the silt content of roads do not appear to have any influence on odour. For dust impacts associated with these matters please refer to the Air Quality section of this document, as the same matters were mentioned in relation to air quality. A conservative worst-case odour emission scenario was modelled, for landfilling at 1M tpa plus green waste processing and composting at the MPC.
		It was also suggested that the level of information regarding odour modelling was insufficient to form a view on the adequacy of the assessment.	A detailed description of odour emission is provided in Section 6.2 of the AQIA. Modelling predictions for a worst-case odour emissions scenario area presented in Section 7.4.
Asbestos	34, 37, 43, 47, 48, 49, 50, 51, 52, 57, 58, 59, 60, 61, 64, 66	A large number of respondents made specific mention of asbestos as a matter of concern. Some respondents claimed that the past record of the facility in terms of asbestos handling was poor and that historical 'non-compliance' should be considered. Some respondents suggested that the facility should not be allowed to accept more asbestos than is currently allowed. Others suggested that no asbestos should be accepted at this facility. Others suggested that illegal asbestos dumping on local roads was an issue.	The storage, disposal and transport of asbestos waste is regulated by the NSW EPA or the local council under the Protection of the Environment Operations Act 1997 and the Protection of the Environment Operations (Waste) Regulation 2014. There are nine waste facilities within the Sydney metropolitan regions which are authorised by the EPA to accept and dispose of asbestos waste. These facilities are in the north, south and west of the metropolitan area. The issue of illegal dumping of asbestos on local roads is a concern to regulators, waste facility operators and the local community. There can be any number of reasons why illegal dumping occurs and the proposed modification for the Genesis facility is one way of addressing the issue. This is because dumping can be incentivised if appropriately licensed landfill facilities are not open when needed, or if facilities are not allowed to accept asbestos contaminated material for landfilling because the landfilling limit has been reached.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			The suggestion that no asbestos be accepted at the facility confronts a similar issue. While there is an understandable sentiment that the existence of Sydney's legacy of asbestos contamination is regrettable, the most appropriate method for mitigating the hazard is to allow appropriately authorised waste facilities to treat and dispose the waste to landfill.
Health impacts	13, 25, 27, 30, 34, 35, 41, 42, 45, 46, 47, 48, 52, 56, 63, 66	A number of respondents pointed to health concerns, specifically local individuals already suffering with respiratory complaints such as asthma. Other medical conditions were linked to pollution and waste by respondents, including dementia, mesothelioma and cancer. The health impacts on young children was also a matter raised by a few respondents. Mental health issues were also raised in relation to noise.	The health effects of potential impacts from the facility are measured in terms of compliance with various EPA metrics for key parameters such as air quality, particularly dust, and noise. The environmental assessment includes the modelling of air quality and noise impacts, and these are shown to be acceptable. While it can be acknowledged that individuals may have concerns, there is reassurance that the relevant EPA standards and guidelines provide the best indication of appropriate levels of control for health-related matters.
Local amenity and character; Inappropriate near residential areas; Nuisance	4, 7, 16, 25, 28, 32, 35, 36, 37, 41, 44, 53	A notable number of respondents expressed a concern that the facility was too close to residential areas. Mention was also made of proximity to schools, child care centres, playing fields, businesses and a proposed future Western Sydney Zoo. Several respondents advanced a view that amenity will be adversely impacted by 24-hour operation. Some respondents noted the sense of community in local suburbs, and expressed their aspirations to raise a family here, and there was concern that the modification may erode that benefit. There was a view that the community needed to feel safe.	The proximity to residential areas, businesses, playing fields and related community infrastructure is assessed not by the simple metric of distance but based on the impact of a specific operational variable such as light, noise and air quality. These variables are all subject to different performance measures set by public authorities such as the EPA. While there is no specific assessment of 'distance to residential' or similar, there are assessments of the separate impacts which can arise from the proposed operations, and these are addressed in the relevant sections of the assessment report. Neighbourhood amenity is a legitimate issue but 'amenity' is a fairly generic term describing the attributes of a neighbourhood which might be considered useful, pleasant or desirable. The assessment of 'amenity' is addressed in this assessment by examining those impacts which might individually or cumulatively materially influence the amenity of the area. Those impacts, such as air quality, traffic, noise and visual impacts are all considered separately in the assessment. The assumption here is that the community needs to feel safe with respect to the presence of a waste management facility in the region.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
			Safety with respect to air quality, traffic and noise are dealt with in those sections of this report. Other public safety aspects, such as crime or anti-social behaviour, are best dealt with through NSW Police and the Community Safety committees within Blacktown City Council (refer to Blacktown City Crime Prevention Plan 2017).
		There was also a view that the development was out of character with the current and future vision for the locality, including the stated objectives for the State Environmental Planning Policy (Western Sydney Employment Area) 2009 ('WSEA SEPP').	It is noted that the State Environmental Planning Policy (Western Sydney Employment Area) 2009 makes specific provision, within Schedule 1, for the Eastern Creek precinct to include an additional permitted use, being a "waste facility for general solid waste" at the former Wallgrove quarry.
		The existing Genesis facility was seen as a 'heavy industry' and out of character with the Eastern Creek Business Hub. The proposed modification was seen as inconsistent with the future Business Hub tenants.	The Eastern Creek Business Park Precinct Plan applies to specific land in the Eastern Creek area. The entire Eastern Creek Precinct was known to have a wide range of existing land-uses and long-term activities, including a landfill and waste management facility, at the time the Business precinct plan was prepared. It is, therefore, not inconsistent with the future vision for the area that the Business Hub and the Genesis facility co-exist. It is also noted that the operation of the facility depends on performance consistent with the conditions of two environment protection licences (EPLs), and these licences ensure that facilities are managed to high environmental standards to reduce any risk of harm to the community and the environment.
Public interest; Waste increases	10, 22, 25, 26, 30, 41, 55, 62	It was suggested by some respondents that this proposed modification provided no benefit to the local community and that there is no public interest in approving the application. The view was expressed that communities will bear the environmental and social cost. There were also some general claims that the modification would be 'bad for Western Sydney'. It was suggested that waste could be transported to Lithgow and used as fuel to generate electricity.	It is important to get the balance right when setting limits of various waste processing methods, and the balance needs to recognise the overall 'gate limit' of 2M tpa. Under current consent conditions, there is potential for the facility to be unable to accept co-mingled material for recycling if the MPC is unable to operate because it cannot dispose the non-recyclable by-product to landfill because the landfilling limit has been reached through acceptance of direct-to-landfill waste. It is also possible that the facility may find that it is unable to accept recyclable material because the annual volume of waste through the gate has reached 2M tpa. Of these two scenarios, based on current market demand, the most likely constraint on recycling is the limit on landfilling.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
		Respondents suggested that rather than modify the consent, the applicant (or perhaps government) should work on strategies to reduce the waste generated. One respondent suggested that the modification was inconsistent with the NSW recycling policies, notably the WARR Strategy, because it will increase the amount of waste being disposed to landfill. It was suggested that an increased capacity to receive direct-to-landfill waste would discourage waste-producing industries from innovating and developing methods to increase reuse and recycling. It was also claimed that the modification would reduce recycling at the facility because the increase in the direct-to-landfill proportion reduces the remaining volume of the available 'gate limit' (2M tpa) which is available for recycling from 1.3M to 1M tpa.	This is why the modification proposes to exclude MPC by-product from the landfilling volume limit. Quite separate to this, the modification proposes to increase the current direct-to-landfill limit from 700,00 tpa to 1M tpa. This is in response to the market demand for landfilling and in particular the likely future increase in demand as major infrastructure projects are commenced. It is important to note that the setting of a limit for landfill volumes at this facility does not influence the extent to which waste is generated by development in the Sydney region. If the appropriate treatment method for a waste stream is landfilling, then the only effect of the annual limit on landfilling is to displace that legitimate need for landfilling to more remote landfill sites. Displacement of demand brings other externalities such as longer haul routes for waste and greater risk of illegal dumping. The incentive for recycling is not driven by limits on landfilling. It is driven by an established market for recycled material. Any operator of a waste facility where landfilling and recycling are both available, will be driven to prefer recycling simply because it makes economic sense.
Road impacts and public safety	11, 13, 30, 34, 35	A few residents raised specific concerns regarding the impact of trucks on local roads. Damage to road surface and congestion were mentioned.	The pattern of traffic movement associated with the Eastern Creek facility will have a diminished (ie diluted effect) the greater the distance from the facility. This is because the vehicle journey origins (for inbound) and destinations (for outbound) can be in a myriad of locations. While the point of waste generation or materials delivery may be in any location, including residential, commercial or industrial areas, the traffic associated with that need will be minor. The aggregation of vehicle movements associated with the operation of the Eastern Creek waste management facility will only be evident on the major roads used to approach or depart the site. These feeder roads for the facility will be Archbold Road, the Great Western Highway, Western Motorway, Old Wallgrove Road and Wallgrove Road. These are multi-lane main roads capable of supporting heavy vehicle traffic.

Table 6.2 **Response to community submissions**

Issue	Respondents	Details	Response/comment
Incinerator / Energy from Waste facility	1, 34, 35, 41, 49	Some respondents raised the issue of the separately proposed (and refused) Energy from Waste (EFW) development. Some respondents stated that the objections to the EFW facility should equally apply to this modification. Others felt that the modification was a 'back door' method of introducing an EFW facility or that the modification was in response to the refusal of the EFW application. There were a number of respondents who felt that the increase in the landfill limit may be a precursor to a revival of the EFW concept. One respondent thought that the EFW facility was proposed as part of this modification.	The Energy from Waste development is not within the scope of this modification.
Non-specific objection	15, 23,24, 33	The specific concerns at the heart of these objections was difficult to categorise for some responses which included "Na", "Enough is enough", "Nonsense" and "We are not a dumping ground".	The nature of these objections has been noted and the responses have been interpreted as a general objection to any increase in volumes of waste or hours of operation, which have been addressed in other responses.
Impact on local property values	7	The respondent anticipates that the value of residential property will decline, causing financial loss.	The Genesis facility is pre-existing, as are other industrial facilities in this precinct, and any influence of proximity to these facilities will already be factored into local property values. These local businesses are also a source of employment, which can be a positive factor for local property. Ultimately, the market will determine the value of property based on a range of factors.
Climate change	4	It is suggested that the facility should do more to address climate change.	The recycling of materials at the facility assists in the mitigation of climate change impacts by reducing demand for new resources and supplying materials back to industry, as well as reducing waste to landfill leading to the reduction in greenhouse gas emissions from landfills.

7 Proposed amended conditions of consent and mitigation

7.1 Key elements

The proposed modification seeks changes to three aspects of current operations:

- the volume of waste which can be landfilled on an annual basis;
- the hours of operation for various activities; and
- the noise criteria.

7.2 The proposed amendments to consent conditions

The conditions proposed for amendment are:

- Schedule 2, Condition 2;
- Schedule 3, Condition 1;
- Schedule 3, Condition 38; and
- Schedule 3, Condition 39.

The proposed amendments to the relevant conditions of the project approval are described below. The proposed modifications are shown in green and redundant text is shown as ~~strike-through~~.

7.2.1 Amendment to Schedule 2, Condition 2

ADMINISTRATIVE CONDITIONS

Terms of Approval

2. The Proponent shall carry out the project in accordance with the:

- a) EA;
- b) Statement of Commitments;
- c) Site plan and building elevation drawings at Appendix 1;
- d) Modification application 06_0139 Mod 1 with supporting document titled Light Horse Business Centre, Environmental Assessment Report: Project Modification prepared by Light Horse Business Centre, dated August 2010 and Additional Information, dated 6.9.2010 and 13.9.2010;
- e) Modification application 06_0139 Mod 2 dated 9.11.10;
- f) Modification application 06_0139 Mod 3 dated 10 May 2011 with supporting document titled Light Horse Business Centre, Environmental Assessment Report: Modification 3, September 2011 prepared by Light

Horse Business Centre (which contains 'LandPartners' operational landform plan, 'Martens' report for stormwater management, and building elevations);

- g) Modification Application 06_0139 Mod 4 with supporting document titled the document titled S75W Modification 4, dated October 2013 and prepared by Urbis Pty Ltd;
- h) Modification Application 06_0139 Mod 5 and supporting documents titled Section 75W Report, Modification 5, dated 18 March 2015, prepared by Urbis Pty Ltd; Response to Submissions, dated 19 May 2015, prepared by Urbis Pty Ltd; and Spoil Management Plan, dated September 2015, prepared by Genesis Xero Waste;
- i) Modification Application 06_0139 Mod 6 and supporting documents titled Genesis Xero Waste Facility Modification 6, dated October 2017, prepared by EMM Consulting Pty Limited; Response to Submissions, dated [TBC], prepared by EMM Consulting Pty Limited; and
- j) Conditions of this approval.

7.2.2 Schedule 3, Condition 1

SPECIFIC ENVIRONMENTAL CONDITIONS

Limits on Input

1. The Proponent shall not:

- a) landfill more than ~~700,000~~1,000,000 tonnes of non-putrescible waste per calendar year (excluding waste generated by recycling processes within the Materials Processing Centre and the Pre-Sort Building);
- a) receive or landfill putrescible waste on site;
- b) stockpile more than 50 tonnes of tyres on site at any one time;
- c) stockpile more than 20,000 tonnes of green waste on site at any one time.
- d) receive waste on site that is contaminated by chemicals and/ or pathogens that will not be rendered harmless by the process or that may constitute a health or environmental risk, including clinical and related waste and diseased carcasses; and
- e) receive waste on site containing contaminants classified as hazardous waste, restricted waste (other than asbestos) or liquid waste under the POEO Act.

7.3 Schedule 3, Condition 38

Noise Impact Assessment Criteria

38. The Proponent shall ensure that noise from the project does not exceed the noise limits in Table 4.

Table 4 Noise Impact Assessment Criteria (consent condition Table 4)

Location	Day	Evening	Night	Morning shoulder
	LA _{eq} (15 minute) dB(A)	LA _{eq} (15 minute) dB(A)	LA _{eq} (15 minute) dB(A)	LA _{eq} (15 minute) dB(A)
Minchinbury residential receivers	36 48	35 47	35 44	35 47
Erskine Park residential receivers	36 39	35 40	35 37	35 40

Notes: (a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres off a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with LA_{eq} (15 minute) noise limits. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

(b) The noise emission limits identified apply under meteorological conditions of:

Wind speed up to 3m/s at 10 metres above ground level; or

Temperature inversion conditions of up to 30C/100m and wind speed up to 2m/s at 0 metres above the ground.

7.3.1 Hours of operation

39. The Proponent shall comply with the restrictions in Table 5.

Table 5 Construction and Operation Hours for the Project (consent condition Table 5)

Activity	Days	Hours
Construction	Monday-Friday	7:00am-6:00pm
	Saturday	8:00am-4:00pm
	Sunday and Public Holidays	Nil
Operations (including waste deliveries and chute use)	Monday-Friday	7:00am-6:00pm
	Saturday, Sunday and Public Holidays	8:00am-4:00pm
MPC	Monday-Friday	6:00am-10:00pm
	Saturday, Sunday and Public Holidays	6:00am-4:00pm

Table 5 **Proposed hours (new Table 5)**

Activity	Days	Existing times	Proposed times
Construction	Monday – Friday	7:00 am to 6:00 pm	7:00am-6:00pm
	Saturday	8:00 am to 4:00 pm	8:00am-4:00pm
	Sunday and Public holidays	Nil	
MPC Operations (waste deliveries and chute use)	Monday – Friday	7:00 am to 6:00 pm	24 hours
	Saturday, Sunday and Public holidays	8:00 am to 4:00 pm	24 hours
Crushing and screening	Monday – Friday	7:00 am – 6:00 pm	6:00 am to 6:00 pm
MPC (including maintenance)	Monday – Friday	6:00 am to 10:00 pm	24 hours
	Saturday, Sunday and Public holidays	6:00 am to 4:00 pm	24 hours
Land fill deliveries (by trucks only)	Monday – Sunday	7:00 am to 6:00 pm	5:00 am to 9:00 pm

39a. Operating hours of the conveyor and chute system are to be restricted to the facility’s operational hours as defined in condition 39 of Schedule 3.

39b. Waste deliveries shall be restricted to the facility’s operational hours as defined in condition 39 of Schedule 3.

39c. ~~Notwithstanding condition 39 of Schedule 3, the MPC may be operated during the extended hours of 6am to 10pm Monday to Friday, and 6am to 4pm Weekends and Public Holidays.~~

7.4 Impact management and mitigation

The changes noted above need to be viewed in the context of their likely impacts but also in terms of the extent to which impacts can be mitigated or managed.

7.4.1 Changes to noise criteria

There will be no impact on local residential areas.

The current noise criteria for the operation of the facility are set below background noise levels and therefore do not provide a reliable benchmark for any noise impact from the facility.

If the changes are approved, the facility will be required to operate within the new noise criteria.

7.4.2 Changes to the landfill limit

There are two changes proposed.

i Re-define landfill to mean ‘direct-to-landfill’ waste only

This change will prevent a situation where landfilling of by-products from recycling processes if forced to cease because if the landfilling from the recycling is not allowed, then the recycling of co-mingled waste also needs to cease.

Environment Protection Licence #13426 requires that the by-product be disposed to landfill.

There is no negative impact on the local community from this change but there is a broader community benefit in ensuring that recycling can continue to be provided at the facility.

ii Increase the landfill limit to 1M tpa

This change will allow more 'direct-to-landfill' waste to be accepted at the facility each year.

There are less truck movements required per tonne of waste when trucks are transporting direct-to-landfill waste because the types of trucks are generally larger capacity and the direct-to-landfill waste is a more dense form of waste. This also means that if the landfilling proportion of the 2M tpa gate limit is increased from 700,000 tpa to 1M tpa, then the gate limit allocated to other materials such as mixed demolition waste is decreased from 1.3M tpa to 1M tpa. These other wastes generate more truck movements per tonne carried, and so the overall effect is to reduce the number of truck movements that would otherwise occur for a 2M tpa gate limit.

When comparing the operation of the facility at maximum capacity without the proposed changes to the operation of the facility at maximum capacity with the proposed changes, the latter will generate less traffic impacts on local roads and residents.

Increasing the amount of landfilling does generate additional dust because there are more vehicles travelling into and out of the landfill pit, but the dust impacts under the 1M tpa landfilling scenario do not exceed the relevant air quality standards.

The Applicant will also relocate the real time air quality monitoring device to a boundary location adjacent to the neighbouring industrial premises, so that reactive management measures can be used to minimise the potential for adverse impacts from site operations. The Applicant will review and update the site's Air Quality Management Plan to document suitable reactive measures and the monitoring-based triggers used to initiate these reactive measures, such as monitoring meteorological forecasts to predict risks of dust emissions (eg wind conditions). This will allow management of the location and intensity of activities or to increase controls relative to daily conditions.

Also note that all current mitigation measures, such as watering of the void haul route and dust suppression (misting) within processing buildings will continue.

7.4.3 Changes to hours of operation

No changes are proposed to the existing conditions relating to construction hours.

New operational hours are proposed based on the different types of activity.

The challenge for this facility is how to manage the forecast increase in Sydney's waste generation with the least impact on the community. There is no simple solution. Waste transporters will invariably seek out the most convenient and appropriate waste management facility for the disposal of waste materials. If Eastern Creek is the nearest appropriate facility, then the drivers will attempt to deliver waste to Eastern Creek.

As the demand increases within the 2M tpa gate limit, the choices are to either force all of the associated activity – truck transport of materials, sorting, processing, stockpiling, plant maintenance and landfilling – into the 7:00am to 6:00pm (Monday-Friday) hours; or to provide more flexibility and avoid congestion for activities by extending the hours.

Hours proposed are tailored to the likely noise impacts of the specific activity. Enclosed activities, such as the operation of the MPC, are lower risk activities in terms of noise impacts on residential areas; whereas outdoor activities such as crushing and screening are a higher risk of noise generation. This is why a modest extension of hours is proposed for crushing and screening, and the proposed hours for the MPC are more generous. These changes are possible without unacceptable impacts on neighbours.

Without the changes, the noise impacts are also acceptable but the risk in terms of congestion, truck queuing and traffic impacts is elevated.

7.4.4 Environmental Management System and management plans

The facility operates subject to a number of operational plans which form part of the Environmental Management System for the site. These are required under conditions to the development consent for the facility and include:

- Noise Monitoring Program;
- Air Quality, Odour and Greenhouse Gas Management Plan;
- Traffic and Transport Code of Conduct;
- Soil, Water and Leachate management Plan;
- Landscape and Vegetation Management Plan;
- Aboriginal Heritage Management Plan;
- Landfill Plan;
- Emergency and Fire Response Plan; and
- Rehabilitation and Closure Plan.

These plans and strategies remain relevant to the operation of the facility and the proposed changes within this modification do not radically alter the fundamental aspects of the facility which are addressed by the management plans. The plans will be updated to reflect the changes arising from this proposed modification.

8 Summary

8.1 Addressing the issues

The matters raised by both the public authorities and the community focussed on the predominant common areas of interest being:

- noise;
- air quality; and
- traffic.

The public authority submissions also sought clarification of matters such as:

- lighting; and
- water and leachate management.

Other issues which attracted a substantial number of comments from the community were:

- odour;
- asbestos;
- health; and
- local character, amenity and nuisance concerns.

All of the main issues, as well as those issues registering fewer comments, were able to be addressed through the provision of additional information or further explanatory text.

A few matters were raised which were considered out of scope. Notably there were some community references to the previously proposed 'waste to energy' facility which is not within the subject site or the subject of this modification, is unrelated to the operation of the subject facility, and was the focus of a separate development proposal. It should also be clarified that the proposal does not seek to vary the 2M tpa gate limit, which is already a condition of the existing approval.

Other than the replacement of Appendix B to the Environmental Assessment - Noise Impact Assessment Report - with the correct version of the Noise Impact Assessment Report, the Environmental Assessment remains unchanged.

8.2 The role of the facility

The facility at Eastern Creek is part of a broader network of waste management facilities across Sydney. This facility, and others, fulfil an important role in the way that the city functions.

While waste generation can be reduced, the population growth, urban development and infrastructure programs which inevitably create waste materials will continue for the foreseeable future.

The facility at Eastern Creek provides two important services to the community. It enables more efficient and effective use of resources by providing facilities to sort, screen and process recyclable waste materials and then

adding value by providing the recycled materials to the market for application in a wide range of developments. The facility also provides an essential means to dispose of waste to landfill where landfilling is the only safe and economic solution for certain waste streams.

The facility is also appropriately licensed to undertake this activity and has the benefit of an existing development consent to receive up to 2M tonnes of waste each year.

This modification seeks to change some of the conditions of the existing development consent which are, or are likely to, create adverse outcomes.

There is a question of balance in what is proposed.

Is it better, for example, to curtail the processing of recyclable material so that a nominal landfill limit is not breached; or to disregard recycling by-product waste when setting landfill limits? Is it better to accept more 'direct-to-landfill' waste at this facility; or send that waste to more distant landfill facilities? Is it better to extend the hours of operation for some activities; or to increase traffic impacts by constraining truck movements to lesser hours?

While there are no simple solutions, a waste management facility needs to deal in waste, and there are impacts associated with that activity. The proposed modification has carefully considered how changes can be made to the conditions relating to volumes, hours and noise criteria while achieving impact levels within objective government guidelines and taking into account both the concerns of the local community and the needs of the broader urban areas of Sydney in terms of demand for waste management.

It is important to note that this proposed modification does not alter the approved 2M tpa 'gate limit' for the facility nor the types of waste which are authorised to be received on site. It does not seek to enlarge to operational area of the facility nor the general arrangement of plant and equipment on site.

The modification was proposed so that the operator of the facility can meet the policy objectives of the NSW Government for recycling, accommodate the increasing demands of Sydney's development activities, and to recalibrate noise measures so that they are meaningful and reliable as indicators of adverse impacts.

8.3 Closing

The responses to both the community and public authority submissions form part of the assessment for this proposed modification, and the information provided in the Response to Submissions Report should be read in conjunction with the main Environmental Assessment.

After the close of the period for public exhibition of the Environmental Assessment and the preparation of the initial Response to Submissions (RTS) Report (provided to DPIE on , there were several letters received, notably from Allens Linklater lawyers on behalf of Jacfin Pty Ltd, and consequently letters between DPIE, the EPA and the Applicant regarding the matters raised by Allens Linklater. These letters are not accounted for in the tables of this RTS since they post-date the preparation of the original RTS. In the interests of transparency and accountability, the letters are provided as Appendices to this RTS.

Finally, we would like to thank the individuals and organisation who took the time to prepare responses to the exhibited Environmental Assessment. All matters received appropriate consideration and a response.

Appendix A

Air quality tables and figures

A.1 Tables and figures

Table A.1 **Statistic evaluation**

Statistical test	Wind speed		Wind Direction		Temperature	
	Benchmark	Result	Benchmark	Result	Benchmark	Result
Fraction of predictions within a factor of 2 (FAC2)	≥ 0.5	0.8	≥ 0.5	0.8	≥ 0.5	1.0
Mean bias (MB)	$\leq \pm 0.5$ m/s	-0.09	$\leq \pm 10$ degrees	-20.8	$\leq \pm 0.5$ K	-0.28
Mean Gross Error (MGE)	$\leq \pm 2.0$ m/s	0.6	$\leq \pm 30$ degrees	65.0	$\leq \pm 2.0$ K	0.9
Pearson correlation coefficient (r)	1	0.8	1	0.5	1	1.0
Index of Agreement (IOA)	1	0.7	1	0.6	1	0.9

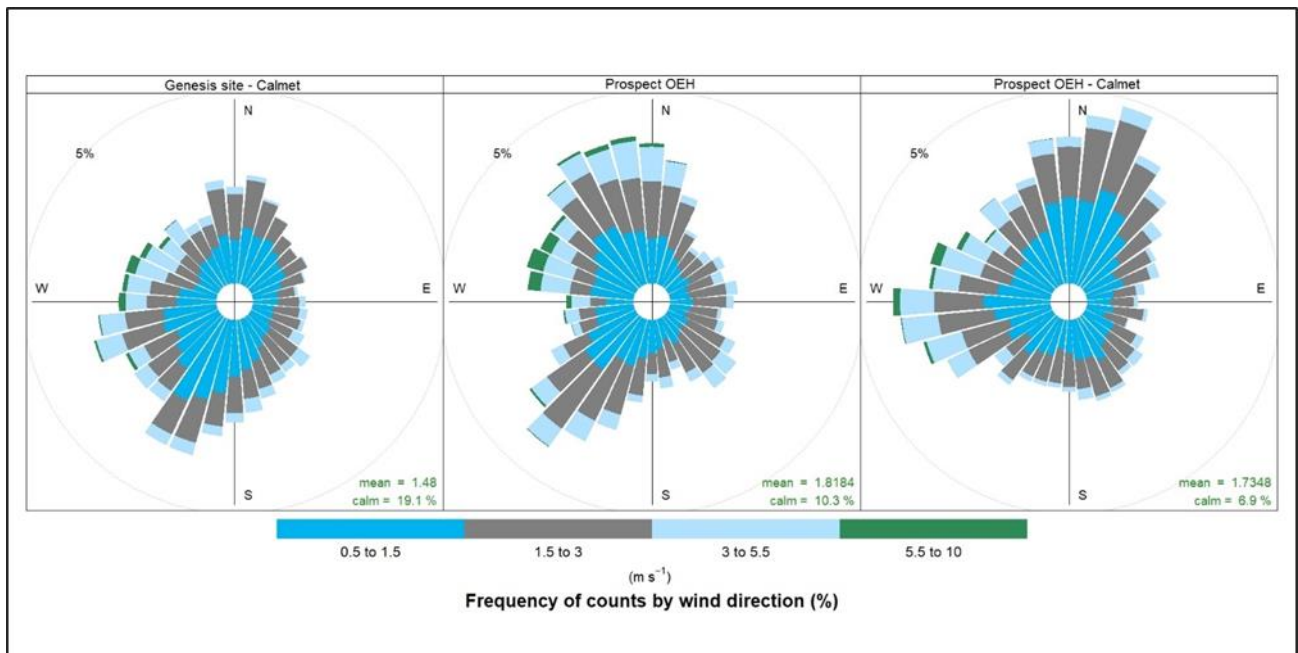


Figure A.1 **Observed and CALMET predicted winds for Prospect**

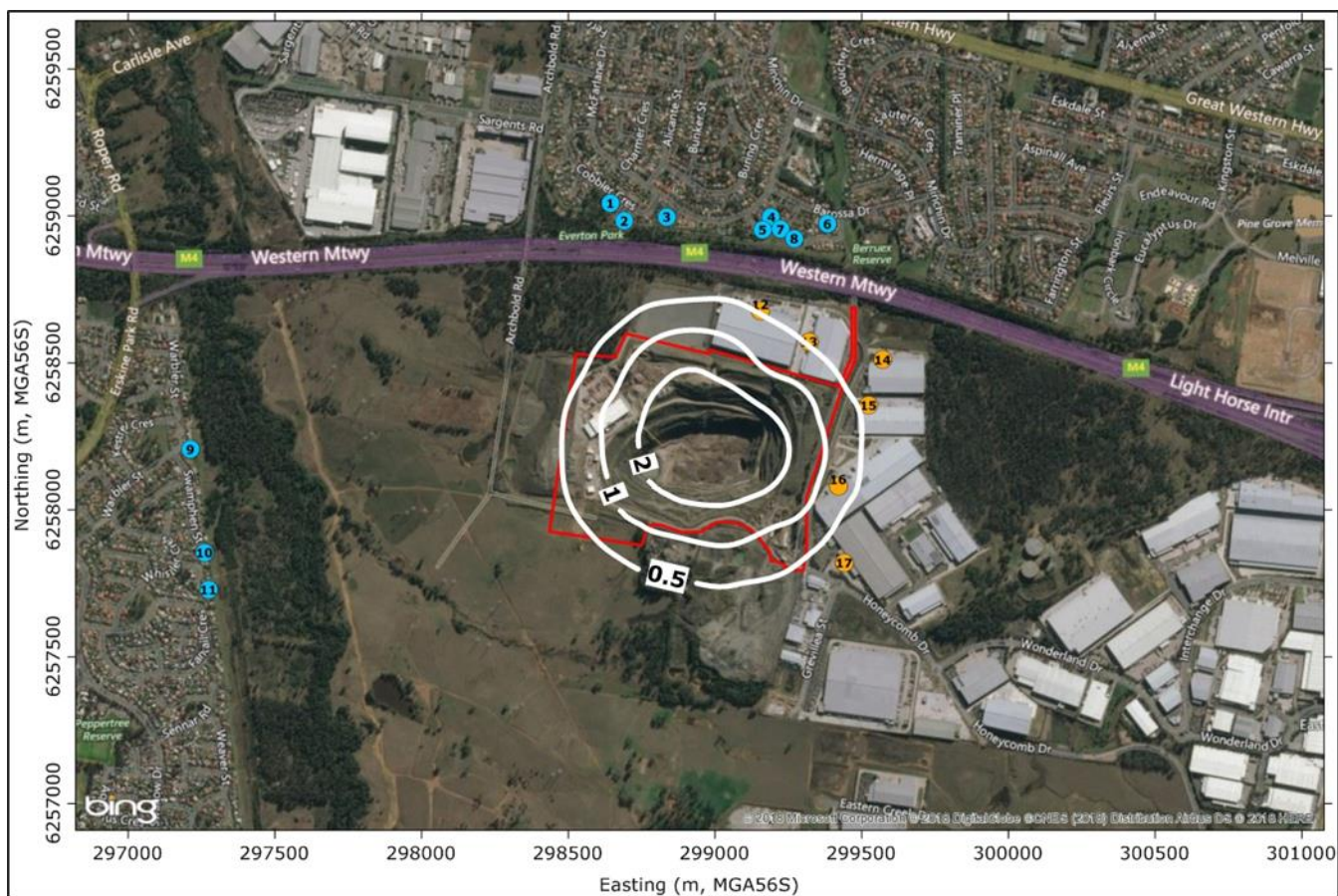


Figure A.2 Dust deposition contours for Mod6

Appendix B

Water and leachate management

B.1 Water and leachate data

CES170514-EMM-AH

Genesis Waste Management Facility
Modification 6 Response to Submissions



CONSULTING
EARTH
SCIENTISTS

Date	Total Discharge (KL)	Average daily (KL) discharge between records
20/03/2018	198174	43
21/03/2018	198217	42.890625
22/03/2018	198259.8906	42.890625
23/03/2018	198302.7813	42.890625
24/03/2018	198345.6719	42.890625
25/03/2018	198388.5625	42.890625
26/03/2018	198431.4531	42.890625
27/03/2018	198474.3438	42.890625
28/03/2018	198517.2344	42.890625
29/03/2018	198560.125	42.890625
30/03/2018	198603.0156	42.890625
31/03/2018	198645.9063	42.890625
1/04/2018	198688.7969	42.890625
2/04/2018	198731.6875	42.890625
3/04/2018	198774.5781	42.890625
4/04/2018	198817.4688	42.890625
5/04/2018	198860.3594	42.890625
6/04/2018	198903.25	42.890625
7/04/2018	198946.1406	42.890625
8/04/2018	198989.0313	42.890625
9/04/2018	199031.9219	42.890625
10/04/2018	199074.8125	42.890625
11/04/2018	199117.7031	42.890625
12/04/2018	199160.5938	42.890625
13/04/2018	199203.4844	42.890625
14/04/2018	199246.375	42.890625
15/04/2018	199289.2656	42.890625
16/04/2018	199332.1563	42.890625
17/04/2018	199375.0469	42.890625
18/04/2018	199417.9375	42.890625
19/04/2018	199460.8281	42.890625
20/04/2018	199503.7188	42.890625
21/04/2018	199546.6094	42.890625
22/04/2018	199589.5	42.890625
23/04/2018	199632.3906	42.890625
24/04/2018	199675.2813	42.890625
25/04/2018	199718.1719	42.890625
26/04/2018	199761.0625	42.890625
27/04/2018	199803.9531	42.890625
28/04/2018	199846.8438	42.890625
29/04/2018	199889.7344	42.890625
30/04/2018	199932.625	42.890625
1/05/2018	199975.5156	42.890625
2/05/2018	200018.4063	42.890625
3/05/2018	200061.2969	42.890625
4/05/2018	200104.1875	42.890625
5/05/2018	200147.0781	42.890625



Date	Total Discharge (KL)	Average daily (KL) discharge between records
6/05/2018	200189.9688	42.890625
7/05/2018	200232.8594	42.890625
8/05/2018	200275.75	42.890625
9/05/2018	200318.6406	42.890625
10/05/2018	200361.5313	42.890625
11/05/2018	200404.4219	42.890625
12/05/2018	200447.3125	42.890625
13/05/2018	200490.2031	42.890625
14/05/2018	200533.0938	42.890625
15/05/2018	200575.9844	42.890625
16/05/2018	200618.875	42.890625
17/05/2018	200661.7656	42.890625
18/05/2018	200704.6563	42.890625
19/05/2018	200747.5469	42.890625
20/05/2018	200790.4375	42.890625
21/05/2018	200833.3281	42.890625
22/05/2018	200876.2188	42.890625
23/05/2018	200919.1094	42.890625
24/05/2018	200962	182
25/05/2018	201144	164.16
26/05/2018	201308.16	164.16
27/05/2018	201472.32	164.16
28/05/2018	201636.48	164.16
29/05/2018	201800.64	164.16
30/05/2018	201964.8	164.16
31/05/2018	202128.96	164.16
1/06/2018	202293.12	164.16
2/06/2018	202457.28	164.16
3/06/2018	202621.44	164.16
4/06/2018	202785.6	164.16
5/06/2018	202949.76	164.16
6/06/2018	203113.92	164.16
7/06/2018	203278.08	164.16
8/06/2018	203442.24	164.16
9/06/2018	203606.4	164.16
10/06/2018	203770.56	164.16
11/06/2018	203934.72	164.16
12/06/2018	204098.88	164.16
13/06/2018	204263.04	164.16
14/06/2018	204427.2	164.16
15/06/2018	204591.36	164.16
16/06/2018	204755.52	164.16
17/06/2018	204919.68	164.16
18/06/2018	205083.84	164.16
19/06/2018	205248	171
20/06/2018	205419	102.75
21/06/2018	205521.75	102.75

Date	Total Discharge (KL)	Average daily (KL) discharge between records
22/06/2018	205624.5	102.75
23/06/2018	205727.25	102.75
24/06/2018	205830	102.75
25/06/2018	205932.75	102.75
26/06/2018	206035.5	102.75
27/06/2018	206138.25	102.75
28/06/2018	206241	102.75
29/06/2018	206343.75	102.75
30/06/2018	206446.5	102.75
1/07/2018	206549.25	102.75
2/07/2018	206652	102.75
3/07/2018	206754.75	102.75
4/07/2018	206857.5	102.75
5/07/2018	206960.25	102.75
6/07/2018	207063	102.75
7/07/2018	207165.75	102.75
8/07/2018	207268.5	102.75
9/07/2018	207371.25	102.75
10/07/2018	207474	196
11/07/2018	207670	134.122449
12/07/2018	207804.1224	134.122449
13/07/2018	207938.2449	134.122449
14/07/2018	208072.3673	134.122449
15/07/2018	208206.4898	134.122449
16/07/2018	208340.6122	134.122449
17/07/2018	208474.7347	134.122449
18/07/2018	208608.8571	134.122449
19/07/2018	208742.9796	134.122449
20/07/2018	208877.102	134.122449
21/07/2018	209011.2245	134.122449
22/07/2018	209145.3469	134.122449
23/07/2018	209279.4694	134.122449
24/07/2018	209413.5918	134.122449
25/07/2018	209547.7143	134.122449
26/07/2018	209681.8367	134.122449
27/07/2018	209815.9592	134.122449
28/07/2018	209950.0816	134.122449
29/07/2018	210084.2041	134.122449
30/07/2018	210218.3265	134.122449
31/07/2018	210352.449	134.122449
1/08/2018	210486.5714	134.122449
2/08/2018	210620.6939	134.122449
3/08/2018	210754.8163	134.122449
4/08/2018	210888.9388	134.122449
5/08/2018	211023.0612	134.122449
6/08/2018	211157.1837	134.122449
7/08/2018	211291.3061	134.122449

Date	Total Discharge (KL)	Average daily (KL) discharge between records
8/08/2018	211425.4286	134.122449
9/08/2018	211559.551	134.122449
10/08/2018	211693.6735	134.122449
11/08/2018	211827.7959	134.122449
12/08/2018	211961.9184	134.122449
13/08/2018	212096.0408	134.122449
14/08/2018	212230.1633	134.122449
15/08/2018	212364.2857	134.122449
16/08/2018	212498.4082	134.122449
17/08/2018	212632.5306	134.122449
18/08/2018	212766.6531	134.122449
19/08/2018	212900.7755	134.122449
20/08/2018	213034.898	134.122449
21/08/2018	213169.0204	134.122449
22/08/2018	213303.1429	134.122449
23/08/2018	213437.2653	134.122449
24/08/2018	213571.3878	134.122449
25/08/2018	213705.5102	134.122449
26/08/2018	213839.6327	134.122449
27/08/2018	213973.7551	134.122449
28/08/2018	214107.8776	134.122449
29/08/2018	214242	126
30/08/2018	214368	118.0952391
31/08/2018	214486.0952	118.0952391
1/09/2018	214604.1905	118.0952391
2/09/2018	214722.2857	118.0952391
3/09/2018	214840.381	118.0952391
4/09/2018	214958.4762	118.0952391
5/09/2018	215076.5714	118.0952391
6/09/2018	215194.6667	118.0952391
7/09/2018	215312.7619	118.0952391
8/09/2018	215430.8572	118.0952391
9/09/2018	215548.9524	118.0952391
10/09/2018	215667.0476	118.0952391
11/09/2018	215785.1429	118.0952391
12/09/2018	215903.2381	118.0952391
13/09/2018	216021.3333	118.0952391
14/09/2018	216139.4286	118.0952391
15/09/2018	216257.5238	118.0952391
16/09/2018	216375.6191	118.0952391
17/09/2018	216493.7143	118.0952391
18/09/2018	216611.8095	118.0952391
19/09/2018	216729.9048	118.0952391
20/09/2018	216848	54
21/09/2018	216902	80.58928571
22/09/2018	216982.5893	80.58928571
23/09/2018	217063.1786	80.58928571

Date	Total Discharge (KL)	Average daily (KL) discharge between records
24/09/2018	217143.7679	80.58928571
25/09/2018	217224.3571	80.58928571
26/09/2018	217304.9464	80.58928571
27/09/2018	217385.5357	80.58928571
28/09/2018	217466.125	80.58928571
29/09/2018	217546.7143	80.58928571
30/09/2018	217627.3036	80.58928571
1/10/2018	217707.8929	80.58928571
2/10/2018	217788.4821	80.58928571
3/10/2018	217869.0714	80.58928571
4/10/2018	217949.6607	80.58928571
5/10/2018	218030.25	80.58928571
6/10/2018	218110.8393	80.58928571
7/10/2018	218191.4286	80.58928571
8/10/2018	218272.0179	80.58928571
9/10/2018	218352.6071	80.58928571
10/10/2018	218433.1964	80.58928571
11/10/2018	218513.7857	80.58928571
12/10/2018	218594.375	80.58928571
13/10/2018	218674.9643	80.58928571
14/10/2018	218755.5536	80.58928571
15/10/2018	218836.1429	80.58928571
16/10/2018	218916.7321	80.58928571
17/10/2018	218997.3214	80.58928571
18/10/2018	219077.9107	80.58928571
19/10/2018	219158.5	80.58928571
20/10/2018	219239.0893	80.58928571
21/10/2018	219319.6786	80.58928571
22/10/2018	219400.2679	80.58928571
23/10/2018	219480.8571	80.58928571
24/10/2018	219561.4464	80.58928571
25/10/2018	219642.0357	80.58928571
26/10/2018	219722.625	80.58928571
27/10/2018	219803.2143	80.58928571
28/10/2018	219883.8036	80.58928571
29/10/2018	219964.3929	80.58928571
30/10/2018	220044.9821	80.58928571
31/10/2018	220125.5714	80.58928571
1/11/2018	220206.1607	80.58928571
2/11/2018	220286.75	80.58928571
3/11/2018	220367.3393	80.58928571
4/11/2018	220447.9286	80.58928571
5/11/2018	220528.5179	80.58928571
6/11/2018	220609.1071	80.58928571
7/11/2018	220689.6964	80.58928571
8/11/2018	220770.2857	80.58928571
9/11/2018	220850.875	80.58928571

Date	Total Discharge (KL)	Average daily (KL) discharge between records
10/11/2018	220931.4643	80.58928571
11/11/2018	221012.0536	80.58928571
12/11/2018	221092.6429	80.58928571
13/11/2018	221173.2321	80.58928571
14/11/2018	221253.8214	80.58928571
15/11/2018	221334.4107	80.58928571
16/11/2018	221415	46.58278146
17/11/2018	221461.5828	46.58278146
18/11/2018	221508.1656	46.58278146
19/11/2018	221554.7483	46.58278146
20/11/2018	221601.3311	46.58278146
21/11/2018	221647.9139	46.58278146
22/11/2018	221694.4967	46.58278146
23/11/2018	221741.0795	46.58278146
24/11/2018	221787.6623	46.58278146
25/11/2018	221834.245	46.58278146
26/11/2018	221880.8278	46.58278146
27/11/2018	221927.4106	46.58278146
28/11/2018	221973.9934	46.58278146
29/11/2018	222020.5762	46.58278146
30/11/2018	222067.1589	46.58278146
1/12/2018	222113.7417	46.58278146
2/12/2018	222160.3245	46.58278146
3/12/2018	222206.9073	46.58278146
4/12/2018	222253.4901	46.58278146
5/12/2018	222300.0728	46.58278146
6/12/2018	222346.6556	46.58278146
7/12/2018	222393.2384	46.58278146
8/12/2018	222439.8212	46.58278146
9/12/2018	222486.404	46.58278146
10/12/2018	222532.9868	46.58278146
11/12/2018	222579.5695	46.58278146
12/12/2018	222626.1523	46.58278146
13/12/2018	222672.7351	46.58278146
14/12/2018	222719.3179	46.58278146
15/12/2018	222765.9007	46.58278146
16/12/2018	222812.4834	46.58278146
17/12/2018	222859.0662	46.58278146
18/12/2018	222905.649	46.58278146
19/12/2018	222952.2318	46.58278146
20/12/2018	222998.8146	46.58278146
21/12/2018	223045.3974	46.58278146
22/12/2018	223091.9801	46.58278146
23/12/2018	223138.5629	46.58278146
24/12/2018	223185.1457	46.58278146
25/12/2018	223231.7285	46.58278146
26/12/2018	223278.3113	46.58278146

Date	Total Discharge (KL)	Average daily (KL) discharge between records
27/12/2018	223324.894	46.58278146
28/12/2018	223371.4768	46.58278146
29/12/2018	223418.0596	46.58278146
30/12/2018	223464.6424	46.58278146
31/12/2018	223511.2252	46.58278146
1/01/2019	223557.8079	46.58278146
2/01/2019	223604.3907	46.58278146
3/01/2019	223650.9735	46.58278146
4/01/2019	223697.5563	46.58278146
5/01/2019	223744.1391	46.58278146
6/01/2019	223790.7219	46.58278146
7/01/2019	223837.3046	46.58278146
8/01/2019	223883.8874	46.58278146
9/01/2019	223930.4702	46.58278146
10/01/2019	223977.053	46.58278146
11/01/2019	224023.6358	46.58278146
12/01/2019	224070.2185	46.58278146
13/01/2019	224116.8013	46.58278146
14/01/2019	224163.3841	46.58278146
15/01/2019	224209.9669	46.58278146
16/01/2019	224256.5497	46.58278146
17/01/2019	224303.1325	46.58278146
18/01/2019	224349.7152	46.58278146
19/01/2019	224396.298	46.58278146
20/01/2019	224442.8808	46.58278146
21/01/2019	224489.4636	46.58278146
22/01/2019	224536.0464	46.58278146
23/01/2019	224582.6291	46.58278146
24/01/2019	224629.2119	46.58278146
25/01/2019	224675.7947	46.58278146
26/01/2019	224722.3775	46.58278146
27/01/2019	224768.9603	46.58278146
28/01/2019	224815.543	46.58278146
29/01/2019	224862.1258	46.58278146
30/01/2019	224908.7086	46.58278146
31/01/2019	224955.2914	46.58278146
1/02/2019	225001.8742	46.58278146
2/02/2019	225048.457	46.58278146
3/02/2019	225095.0397	46.58278146
4/02/2019	225141.6225	46.58278146
5/02/2019	225188.2053	46.58278146
6/02/2019	225234.7881	46.58278146
7/02/2019	225281.3709	46.58278146
8/02/2019	225327.9536	46.58278146
9/02/2019	225374.5364	46.58278146
10/02/2019	225421.1192	46.58278146
11/02/2019	225467.702	46.58278146

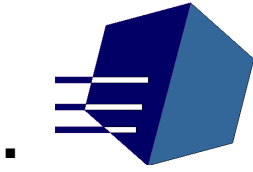
Date	Total Discharge (KL)	Average daily (KL) discharge between records
12/02/2019	225514.2848	46.58278146
13/02/2019	225560.8675	46.58278146
14/02/2019	225607.4503	46.58278146
15/02/2019	225654.0331	46.58278146
16/02/2019	225700.6159	46.58278146
17/02/2019	225747.1987	46.58278146
18/02/2019	225793.7815	46.58278146
19/02/2019	225840.3642	46.58278146
20/02/2019	225886.947	46.58278146
21/02/2019	225933.5298	46.58278146
22/02/2019	225980.1126	46.58278146
23/02/2019	226026.6954	46.58278146
24/02/2019	226073.2781	46.58278146
25/02/2019	226119.8609	46.58278146
26/02/2019	226166.4437	46.58278146
27/02/2019	226213.0265	46.58278146
28/02/2019	226259.6093	46.58278146
1/03/2019	226306.1921	46.58278146
2/03/2019	226352.7748	46.58278146
3/03/2019	226399.3576	46.58278146
4/03/2019	226445.9404	46.58278146
5/03/2019	226492.5232	46.58278146
6/03/2019	226539.106	46.58278146
7/03/2019	226585.6887	46.58278146
8/03/2019	226632.2715	46.58278146
9/03/2019	226678.8543	46.58278146
10/03/2019	226725.4371	46.58278146
11/03/2019	226772.0199	46.58278146
12/03/2019	226818.6026	46.58278146
13/03/2019	226865.1854	46.58278146
14/03/2019	226911.7682	46.58278146
15/03/2019	226958.351	46.58278146
16/03/2019	227004.9338	46.58278146
17/03/2019	227051.5166	46.58278146
18/03/2019	227098.0993	46.58278146
19/03/2019	227144.6821	46.58278146
20/03/2019	227191.2649	46.58278146
21/03/2019	227237.8477	46.58278146
22/03/2019	227284.4305	46.58278146
23/03/2019	227331.0132	46.58278146
24/03/2019	227377.596	46.58278146
25/03/2019	227424.1788	46.58278146
26/03/2019	227470.7616	46.58278146
27/03/2019	227517.3444	46.58278146
28/03/2019	227563.9272	46.58278146
29/03/2019	227610.5099	46.58278146
30/03/2019	227657.0927	46.58278146

Date	Total Discharge (KL)	Average daily (KL) discharge between records
31/03/2019	227703.6755	46.58278146
1/04/2019	227750.2583	46.58278146
2/04/2019	227796.8411	46.58278146
3/04/2019	227843.4238	46.58278146
4/04/2019	227890.0066	46.58278146
5/04/2019	227936.5894	46.58278146
6/04/2019	227983.1722	46.58278146
7/04/2019	228029.755	46.58278146
8/04/2019	228076.3377	46.58278146
9/04/2019	228122.9205	46.58278146
10/04/2019	228169.5033	46.58278146
11/04/2019	228216.0861	46.58278146
12/04/2019	228262.6689	46.58278146
13/04/2019	228309.2517	46.58278146
14/04/2019	228355.8344	46.58278146
15/04/2019	228449	86.6
16/04/2019	228535.6	86.6
17/04/2019	228622.2	86.6
18/04/2019	228709	135.8
19/04/2019	228844.8	135.8
20/04/2019	228980.6	135.8
21/04/2019	229116.4	135.8
22/04/2019	229252.2	135.8
23/04/2019	229388	135.8
24/04/2019	229519	131
25/04/2019	229679.5	160.5
26/04/2019	229840	160.5
27/04/2019	229928.3333	88.33333
28/04/2019	230016.6667	88.33333
29/04/2019	230105	88.33333
30/04/2019	230201	96
Total (KL)	32027	

Data provided by Bingo Industries Pty Ltd.

BOLD - Confirmed volumes [remainder volumes have been averaged]

B.2 Leachate generation model (Consulting Earth Scientists)



CONSULTING EARTH SCIENTISTS

MOD 6 – LEACHATE GENERATION MODEL
GENESIS LANDFILL AND RECYCLING FACILITY
PREPARED FOR DIAL-A-DUMP INDUSTRIES PTY LTD
CES DOCUMENT REFERENCE: CES170514-EMM-AC

Written by: Miles Thompson
Reviewed by: David Johnson

Authorised by: Duncan Lowe

Client: Dial-a-Dump Industries Pty Ltd
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Date: 14 August 2017

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MOD 6 – LEACHATE GENERATION MODEL
GENESIS LANDFILL AND RECYCLING FACILITY
PREPARED FOR DIAL-A-DUMP INDUSTRIES PTY LTD
CES REFERENCE: CES170514-ECS-AC

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MOD 6 – LEACHATE GENERATION MODEL
GENESIS LANDFILL AND RECYCLING FACILITY
PREPARED FOR DIAL-A-DUMP INDUSTRIES PTY LTD
CES REFERENCE: CES170514-EMM-AC

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MOD 6 – LEACHATE GENERATION MODEL
GENESIS LANDFILL AND RECYCLING FACILITY
PREPARED FOR DIAL-A-DUMP INDUSTRIES PTY LTD
CES REFERENCE: CES170514-EMM-AC

1 INTRODUCTION

Consulting Earth Scientists Pty Ltd (CES) was commissioned by Dial-A-Dump Industries Pty Ltd (DADI) (the client) to provide an updated leachate generation model for the Genesis Landfill and Recycling Facility (the Site), to support the Major Project Approval No. 06_139 Modification 6 (Mod 6) application to modify the landfill cap and to change the operating hours for all activities within the facility. The change in operating hours will change the leachate generation profile over the filling period of the site, due to increased filling rates and increased volumes of irrigation water being used for dust suppression.

2 OBJECTIVES

The objective of the leachate model is to estimate the amount leachate generated at the site under the proposed Mod 6 operating conditions. To assess the amount of leachate generated at the site, CES has completed the following work:

- Reviewed available information pertaining to leachate management provided by DADI;
- Reviewed the existing site water balance assessment produced by CES (CES Document Reference: CES161004-ECS-AD);
- Conducted a back analysis of leachate generation using the information from the above water balance assessment;
- Development of a landfill filling and leachate generation model for the site under the proposed operating conditions, being the removal of the 700,000 tonne per annum landfilling limit, using the outputs from the Mod 6 water balance assessment (CES Document Reference CES170514-EMM-AB); and,
- Preparation of this report assessing leachate generation under the proposed Mod 6 operating conditions.

3 BACKGROUND INFORMATION

3.1 SITE LOCATION AND DESCRIPTION

The Genesis Landfill and Recycling Facility is located at Eastern Creek, NSW and is surrounded by a mix of commercial, open space, infrastructure (M4 motorway) and industrial developments.

The facility currently operates under two different Environmental Protection Licenses (EPL) issued by the NSW EPA, licence numbers 13426 and 20121.

3.2 LANDFILL HISTORY

The predominant feature at the site is a breccia quarry, formerly known as the Pioneer Quarry, where it is understood that extractive operations started in the 1950s. The quarry reached the end of its economic life and all quarrying activities at the site ceased in September 2006, although the open cut quarry void remains.

3.3 LANDFILL GEOMETRY

The landfill geometry information was reported in the *Leachate Collection System, Concept Design* (ERM, August 2008) as:

The open cut elliptical void is approximately 430 metres (m) x 700 m and up to 150 m in depth. The surface area is approximately 288,000 m² at ground surface and 12,000 m² at the base.

The landfill geometry used in this report is based upon that estimated from the site water balance assessment (CES161004-ECS-AD). Pertinent dimensions to this leachate generation model are:

Table 1: Estimated Landfill Areas

Dimension	Estimated area (m ²)
Total Landfill Catchment Area	472,000
Operating area of landfill (as at September 2016)	73,000
Area of 8 ML stormwater pond	5,525

3.3.1 Walls of Void

Benches of approximately 7 to 8 m in width exist along the sides of the void. The upper part of the quarry is excavated through unconsolidated sediments including clays and weathered shales and therefore has lower angled slopes. A spiral access road around 20 m in width around the edge of the void descends to the quarry base. Stormwater drains control run-off on the access road.

3.3.2 Base of void

A rectangular level area (-57m above Australian Height Datum (AHD)) forms the base of the former void. A raised area (approximately 8m higher) is present to the east of the rectangular base. The base is fairly flat and drains to a sump from which groundwater ingress and run off is currently pumped. These areas have been entirely covered with landfill material.

The current base of the void is at approximately -10 m AHD and is approximately 10m lower than the 8 ML stormwater dam located in the western portion. The active filling area is in the eastern portion of the pit.

3.4 GEOLOGY AND HYDROGEOLOGY

A full review of the geology and hydrogeology of the site is set out in *Groundwater Assessment* (ERM, July 2008). The key features that relate to the collection of leachate are:

- the surficial geology comprises clay and weathered shales to a depth of approximately 32 m below ground level (bgl). Intact (Bringelly) shales predominate below the weathered shales down to depths approximating 146 m bgl. The Hawkesbury Sandstone is likely to be located approximately 20 m below the base of the quarry;
- there is an intermittent shallow perched groundwater system located around the quarry within the fill, clay and weathered shale. Permeabilities of these deposits range from 1.46E^{-3} m/day to 0.25 m/day. Based on the very isolated seepage observed from the clay and weathered shales exposed on the pit walls, this system is not in significant hydraulic contact with the quarry. This suggests that, provided leachate levels within the pit are kept below the base of the shallow aquifer system, leachate migration into this system is unlikely to occur. The water quality of this aquifer is considered to be poor and of limited human and environmental value; and
- there is a deeper regional groundwater system located within the shale deposits. The permeability of this shale has been calculated to be very low (1.75E^{-6} m/day to 8.7E^{-6} m/day). The elevation of this water table is likely to be in excess of 24 m AHD, which approximates 82 m above the original pit base. This indicates a strong inward hydraulic gradient and suggests that the bulk formation hydraulic properties (including fracturing) of

the surrounding geology are low. Given the low permeabilities of the geology surrounding the pit there is unlikely to be significant hydraulic contact between the quarry pit and the underlying Hawkesbury Sandstone. Overall, seepage from regional groundwater system into the quarry pit was estimated to approximate 2 m³/day. The water quality of this aquifer is considered to be poor and of limited human and environmental value.

3.5 PROJECT APPROVAL

The current Project Approval (06_0139) provides for:

- A waste recovery facility including a MPC and greenwaste area. It is noted that the facility is not currently operating a greenwaste activities;
- Rehabilitation of the quarry void via a Class 2 (non-putrescible) landfill;
- Total throughput of up to 2 million tonnes of materials at the site per calendar year;
- Landfilling of up to 700,000 tonnes of non-putrescible waste (including asbestos);
- Stockpiling of up to 50 tonnes of tyres on site at any one time; and
- Stockpiling of up to 20,000 tonnes of greenwaste on site at any one time.

Although not all of the approved modifications are strictly relevant to the leachate modelling, the following modifications to the above original consent have been approved and included in this report for completeness:

3.5.1 Modification 1

Modification 1 (MOD 1 granted by the Minister on 30 September 2010) approved the following components:

- Electrically powered conveyor and chute;
- Postponed commencement of construction;
- Two way traffic on Fourth Avenue;
- Concrete bay walls within the greenwaste processing area; and
- Relocation of the wheelwash.

3.5.2 Modification 2

Modification 2 (MOD 2 granted by the Minister on 9 November 2010) comprised a correction to the land description details of the project Approval. The corrected reference to the land being Lots 1, 2, 3 and 4 in DP 1145808.

3.5.3 Modification 3

Modification 3 (MOD 3 granted by the Minister on 5 December 2011) approved the following components:

- Revised final landform level of the fill pad at Area D;
- Operational landform levels and site stormwater design;
- Internal office and external amenities to the Weighbridge;
- New amenities building;
- New amenities building associated with the spotter stations;
- New administrative/office building;
- New amenities at the tarp stand area;
- Approval for the use and relocation of the vehicle turning bay which works have already been carried out; and
- Voluntary planning agreement.

3.5.4 Modification 4

Modification 4 (MOD 4 granted by the Minister on 14 December 2013) approved the following components:

- Extended operating hours for the MPC allowing it to be operated during the hours of 6am to 10pm Monday to Friday, and 6am to 4pm Weekends and Public Holidays; and
- Modifications to the noise levels in Table 4, which provided that the Proponent would not exceed 36 LAeq (15 minute) dB(A) during the day and 35 LAeq (15 minute) dB(A) during the evening and Morning Shoulder.

3.5.5 Modification 5

Modification 5 (MOD 5 granted by the Minister on 17 March 2016) approved the following components:

- Allow construction of a Pre-Sort Enclosure in accordance with the plans submitted with the modification application.

3.6 MODIFICATION 6

3.6.1 Current Operations Conditions

The Proponent currently operates as follows:

Table 2 – Current Genesis Landfill and Recycling Facility Operation Hours (Table 5, Condition 39, Schedule 3, Project Approval (06_0139) as amended by MOD 4.

Activity	Day	Time
Construction	Monday – Friday	07:00am to 18:00pm
	Saturday	08:00am to 16:00pm
	Sunday and Public Holidays	Not Approved

Operation	Monday – Friday	07:00am to 18:00pm
	Weekend and Public Holidays	08:00am to 16:00pm
MPC	Monday – Friday	06:00am to 22:00pm
	Weekend and Public Holiday	06:00am to 16:00pm

Clause 39a of the Project Approval states:

- *Operating hours of the conveyor and chute system are to be restricted to the facility's operational hours (and not times governing the Operation of the MPC as above) and as defined in condition 39 of Schedule 3.*

The maximum mass of material applied to land is 700,000tpa, with a maximum limit of material received at the facility of 2Mtpa.

3.6.2 Proposed Modification to Operating Conditions

The proponent proposes to amend the Existing Table 5 of Condition 39 (as set out above and amended by Modification 4).

Table 3 – Proposed Changes to Table 5, Condition 39

Activity	Sub-activity	Days	Hours
Construction		Monday-Friday	7am-6pm
		Saturday	8am-4pm
		Sunday and public holidays	nil
MPC and PSE	Receive Materials	Monday to Sunday	24 Hours
	Operations	Monday to Sunday	24 Hours
SMA	Receive Materials	Monday to Sunday	24 Hours
	Crushing and Screening	Monday to Sunday	6:00am to 6:00pm
Landfill	Receive Materials by truck	Monday to Sunday	5am-9pm
	Convey waste from MPC to landfill via chute	Monday to Sunday	24 Hours
Maintenance			
MPC, PSE and landfill	Repair machinery	Monday to Sunday	24 Hours
SMA	Cleaning and machinery repairs	Monday to Sunday	24 Hours

Chute	Clearing of blockages and general repairs	Monday to Sunday	24 Hours
-------	---	------------------	----------

The landfilling limit of 700,000tpa is removed. The 2Mtpa limit on material received at the facility is unchanged by this modification.

3.7 INFILLING PROCEDURE AND LANDFILL LEACHATE GENERATION

It is understood that the currently achieved infilling rate of the landfill is approximately 500,000tpa (estimated to be 295,000 m³/year).

In 2008 ERM developed a leachate model for the site. The key data relevant to this document are summarized as follows:

- The design of the infilling system will allow separation of surface water run-off from the sides of the landfill from the rain falling directly onto the landfill waste and infiltrating to become leachate. This will significantly reduce the volume of leachate generated; However, it should be noted that the separated rainwater that is pumped/discharged to the pit stormwater dam and the surface dams (including the tanks underneath the Materials Processing Centre (MPC)) is used for irrigation/dust suppression of the waste area. As a result, this water may generate leachate.
- ERM conservatively estimated the volumes of surface water and leachate generated within the landfill. Based on this, leachate generated is anticipated to range between 45 and 872 m³/day, with an average of 241 m³/day;
- As a result, ERM estimated that in order to maintain groundwater elevations at acceptable levels within the landfill, pumping rates from the landfill will be required to range between 250 m³/day and 500 m³/day;
- ERM stated that provided that pumping rates do not fall below 241 m³/day, the landfill will be able to be used as a storage facility during times of high rainfall. This pumping rate allowed a constant flow rate to be achieved from the leachate collection system and would negate the need for surface storage capacity for leachate pumped from the landfill;
- At the completion of the landfill and subsequent capping, leachate generation is likely to fall below 90 m³/day. Due to the potentially poor ability of the regional groundwater system to absorb this volume of leachate there is potential for leachate elevations to eventually rise above the regional groundwater elevation and begin recharging the shallow perched groundwater system. Post landfill monitoring will help to quantify this process, however, there is potential for ongoing pumping to be required to prevent impact to receptors in potential hydraulic contact with the landfill.

3.8 BASECASE WATER BALANCE

In 2016 CES prepared a water balance (CES document reference CES161004-ECS-AD) for the site to assess the measured leachate extraction rates with the expected water inflows and outflows. For the purpose of this leachate generation model, the water balance has been modified such that the data reflects actual operating conditions at the site. The following assumptions were used in preparation of the water balance:

- Total leachate generating landfill footprint area = 288,000 m²;
- Initial base of operating landfill footprint area = 73,000 m² (as at September 2016);
- Total footprint area of 8 ML stormwater pond = 5,525 m²;
- Assume 10% of rainfall on the sidewalls interacts with landfill waste; 90% is collected by stormwater systems, adsorbed, or evaporated.
- Irrigation volumes of; 10,260 m³/year water cart irrigation, 113,763m³/year water cannon irrigation volume, 31,026 m³/year sprinkler volume, for a total leachate volume from irrigation of 21,707 m³/year, assuming 14% of irrigation waters interacts with waste in the landfill pit. The 14% assumption has been based upon a reconciliation of leachate production against the 2016 water balance (CES document reference CES161004-ECS-AD).
- The estimated flow rate of groundwater into the landfill is reported by ERM as 2 m³/day (730 m³/yr).
- Evaporation of 1.3091 m/year (Bureau of Metrology).
- 90th percentile rainfall of 1.1782m/year (Bureau of Metrology).

Based on the information above, the Water Balance Summary has been estimated and is reproduced in Table 4.

Table 4: Leachate Volume Summary

Source		Volume (m ³ /yr)
V ₁	Net Rainfall on waste in landfill pit	+126,509
V ₂	Net Irrigation on waste in landfill pit	+21,707
V ₃	Seepage from groundwater	+730
Total Estimated Water Inputs		+161,927
V ₄	Evaporation from Landfill pit with current waste deposit at -10 mAHD	-88,332
Net Water Balance (m ³ /yr)		+60,614

V ₅	Leachate pumped out from landfill pit	-61,485
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This water balance conducted between 30/09/2015 and 1/10/2016 has been included in this report as the basis of the back analysis exercise. Note that this water balance differs from the Mod 6 water balance assessment (CES document reference CES170514-EMM-AB), which provides an assessment of the water balance under the Mod 6 conditions, and has been utilised in the leachate model below.

4 LEACHATE MODELLING

4.1 BACK ANALYSIS

A back-analysis of leachate generation has been conducted utilising the water balance information presented in Table 4. The back-analysis which has been conducted reconciles the theoretical modelled leachate generation with observed leachate generation from the site. This model validation improves the confidence in the results from the Mod 6 projection leachate model. The leachate generation model was run over a period of 100 years, and the median volume of leachate generated was calculated for the initial landfill geometry (that is to say, the geometry which was used in the formation of the water balance presented above), calculated. The subsurface inflow parameter for the vertical percolation layer (waste) was varied such that the average annual volume of leachate collected was approximately equal to V₅, measured leachate pumped out from the landfill pit. This was calculated to be 0.10cm/day/m². This inflow accounts for V₂ net irrigation on waste in landfill pit. Details of the hydrogeological model are discussed in in Section 3.7.1.

Table 5: Leachate Generation Back Analysis

Model	Leachate collection volume (m ³)
Recorded Leachate Extraction (01/10/15 to 30/09/2016)	61,485
Back Analysis (irrigation of 0.10cm/day/m ²)	62,408 ⁽¹⁾

⁽¹⁾Median over 100 year period using synthetic weather model.

Groundwater seepage into the pit of an estimated volume of 2m³/day was added separately to the calculated leachate generation (ERM, 2008).

Based on the results of the Mod 6 water balance, the expected irrigation water use on the landfill pit is 26,753m³/year. This represents a 23% increase of the base case, and therefore an irrigation rate of 0.123cm/day/m² has been adopted for use in the leachate generation model for Mod 6.

4.1.1 Hydrogeological Model

The Hydrological Evaluation of Landfill Performance (HELP) model developed by the United States Environment Protection Agency (USEPA) Risk Reduction Engineering Laboratory was used to provide estimates of leachate generation rates for the completed landfill profile at the site.

The HELP model is a quasi-two-dimensional, unsaturated zone hydrological model. The model was developed by the USEPA to assist in predicting landfill hydrologic processes and testing the effectiveness of landfill designs. The model provides information on the percolation of water through the landfill profile, changes in the volume of water stored in each landfill component and the predicted quantity of water moving out of a landfill.

The landfill profile modelled in the hydrological simulations using HELP comprises the following components:

- Vertical percolation layers (Waste);
- Lateral Drainage layers (Gravel);
- Barrier soil (Clay).

Vertical water movement is modelled through the landfill cap, waste, and barrier layers. The following layer properties have been considered in the HELP model:

- Porosity.
- Field capacity.
- Wilting point (relevant for layers used as a growing medium).
- Saturated hydraulic conductivity.
- Subsurface inflow (irrigation and groundwater inflow may be crudely incorporated using this property).
- Initial moisture content.

Landfill water-balance modelling using the HELP model has been carried out in the following sequence:

1. Construct a conceptual model of the landfill in the form of a HELP profile.
2. Select climatic locations for weather data.
3. Nominate a time frame for modelling.
4. Evaluate the results of each model run.
5. Modify the profile as required and re-run the model.

It is important to note that the HELP model provides only broad-scale estimates of leachate generation, which can vary considerably from field conditions. As such, results should be regarded as coarse estimates only.

The landfill modelled using HELP is presented in Table 6.

Table 6: Water Balance Modelled Landfill Profile

Layer Number	Layer Type	Thickness (m)	Porosity	Field Capacity	Saturated Hydraulic Conductivity ¹	Sub-surface Inflow (mm/d)	Leachate Re-circulated (%) Collected
1	General Solid Waste	100 ⁽³⁾	0.671	0.292	1.0×10^{-3}	0.10 ⁽²⁾	0
2	Aggregate Drainage Layer (gravel)	0.3	0.397	0.032	0.3	0	0
3	Barrier Soil (Compacted Clay)	1.0	0.427	0.418	8.64×10^{-4}	0	0

(1) Saturated hydraulic conductivity expressed in units of cm s^{-1} , consistent with HELP model input. For example, permeability of 10^{-8} m s^{-1} is equivalent to $10^{-6} \text{ cm s}^{-1}$.

(2) Determined through iteration to approximate leachate collection data.

(3) This value was varied between 15 and 100m, with a difference in leachate generation of approximately 1.1% calculated. This difference is considered insignificant and as such the effect of variable waste thickness has not been included in the model.

A synthetic weather generator has been incorporated into the HELP model. Data for Sydney Airport meteorological station has been used in the modelling exercise. The HELP model was run on a yearly timescale for 100 years.

4.2 CONCLUSION AND MODIFICATION 6 PROJECTION

The following assumptions and changes have been made for the leachate generation model under the Modification 6 operating conditions:

- Irrigation volumes are increased by 23% as a result of additional dust suppression requirements, and
- Landfilling rate is increased as a result of additional allowable time for waste delivery and removal of the landfilling limit of 700,000tpa.

A landfilling model has been prepared to assist with calculation of the leachate volumes. The average annual leachate collection of the HELP model has been applied to the area of the landfill base, with the addition of leachate being generated from the pit walls at a rate of 10% of the annual

precipitation. The landfilling model assumes the pit to be filled at an even rate, with the pit being approximated to be a truncated cone. Two scenarios under the Modification 6 operating conditions have been considered in this assessment; the maximum case where the 2Mtpa received is all landfilled, and a 50% increase over the currently realised filling rate.

The parameters varied in the models are presented in Table 7.

Table 7: Leachate model scenarios

	Landfilling rate (m ³ /year)	Landfilling rate (tpa)	Irrigation rate (cm/day/m ²)
Base case	295,000	472,000	0.100
Modification 6 – 50% increase over existing filling rate	442,500	708,000	0.123
Modification 6 – 2Mtpa	1,250,000	2,000,000	0.123

The estimated leachate generation, compared to the base case estimation is presented in Figure 1 below.

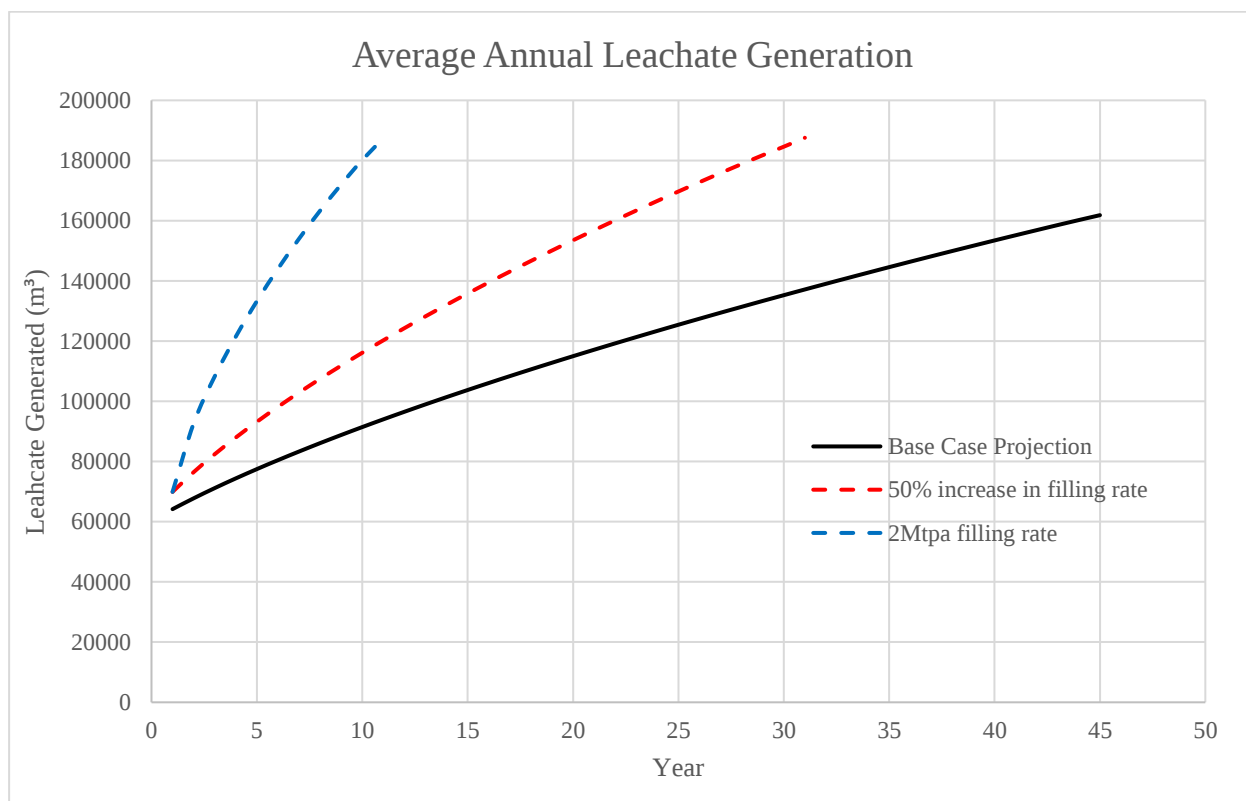


Figure 1: Estimated Leachate Generation

Figure 1 shows that initially Modification 6 results in approximately 9% additional leachate being generated over the base case, increasing to 15% at the time of landfill completion. Under the Mod 6 case, the average expected initial leachate extraction rate is 192m³/day, increasing to 505m³/day at the completion of landfilling.

It should be noted that leachate generation under this model is primarily a function of the height of waste in the landfill pit, and therefore the area where rainfall will interact with waste.

CES understands that Genesis has capacity for leachate treatment of approximately 219,000m³/year via five Sequence batch reactors (SBRs), based on 7 to 9 hours treatment time. The leachate generation model using the Mod 6 conditions indicates the maximum annual leachate volume generated will be approximately 185,000m³/year, which is less than the current leachate treatment activity. It is further understood that the Tradewaste Water Consent for treated leachate disposal has a maximum discharge of 650kL/day (237,250m³/year), which is greater than the expected maximum leachate generation volume.

During periods of prolonged or heavy rainfall, it could be expected that leachate generation rates exceed those reported here for a short time. CES understands that the leachate conveyance system has capacity to store excess leachate within the pit prior to treatment and discharge.

This model does not consider the effect of capping of the landfill once filling is complete, and the leachate generation estimate of the capped landfill previously reported in ERM (2008) is not affected by Mod 6.

CES understands that the leachate collection system has a designed capacity of 890m³/day (324,850m³/year) which is greater than the maximum expected leachate volume under the Mod 6 conditions.

5 REFERENCES

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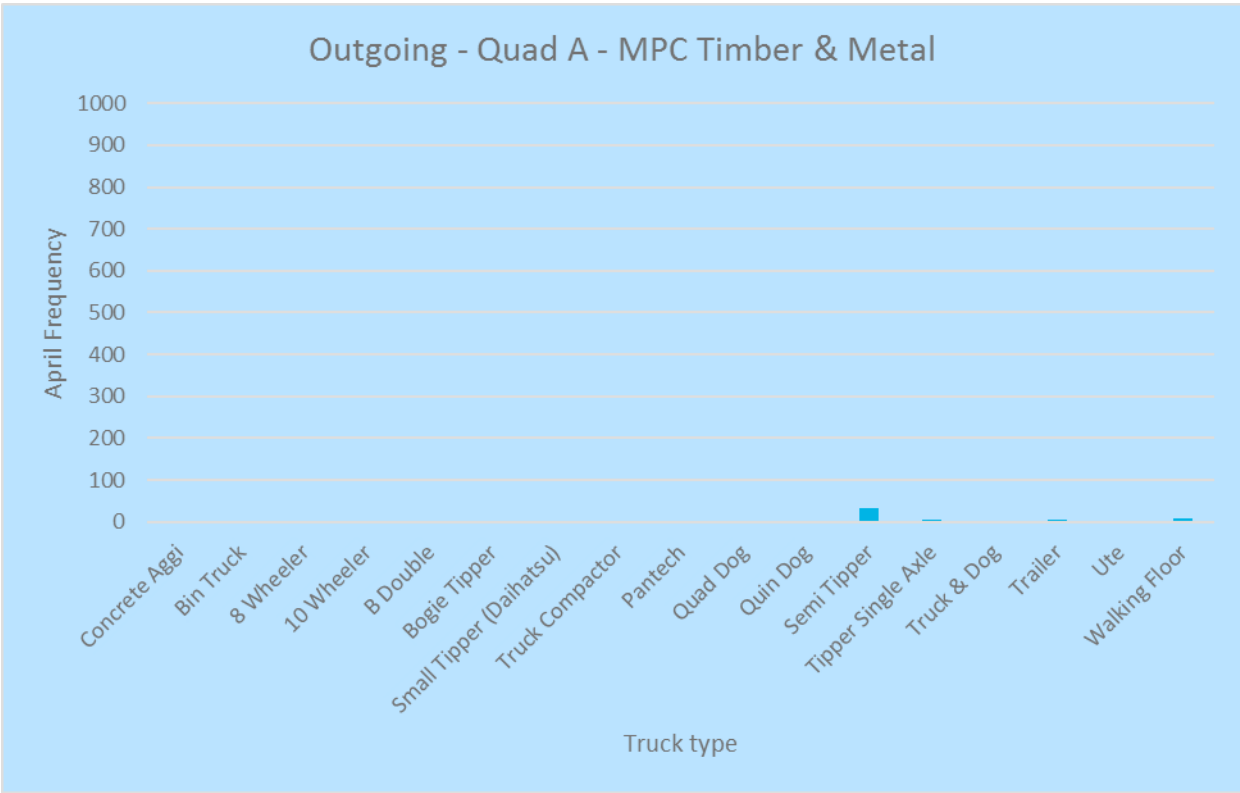
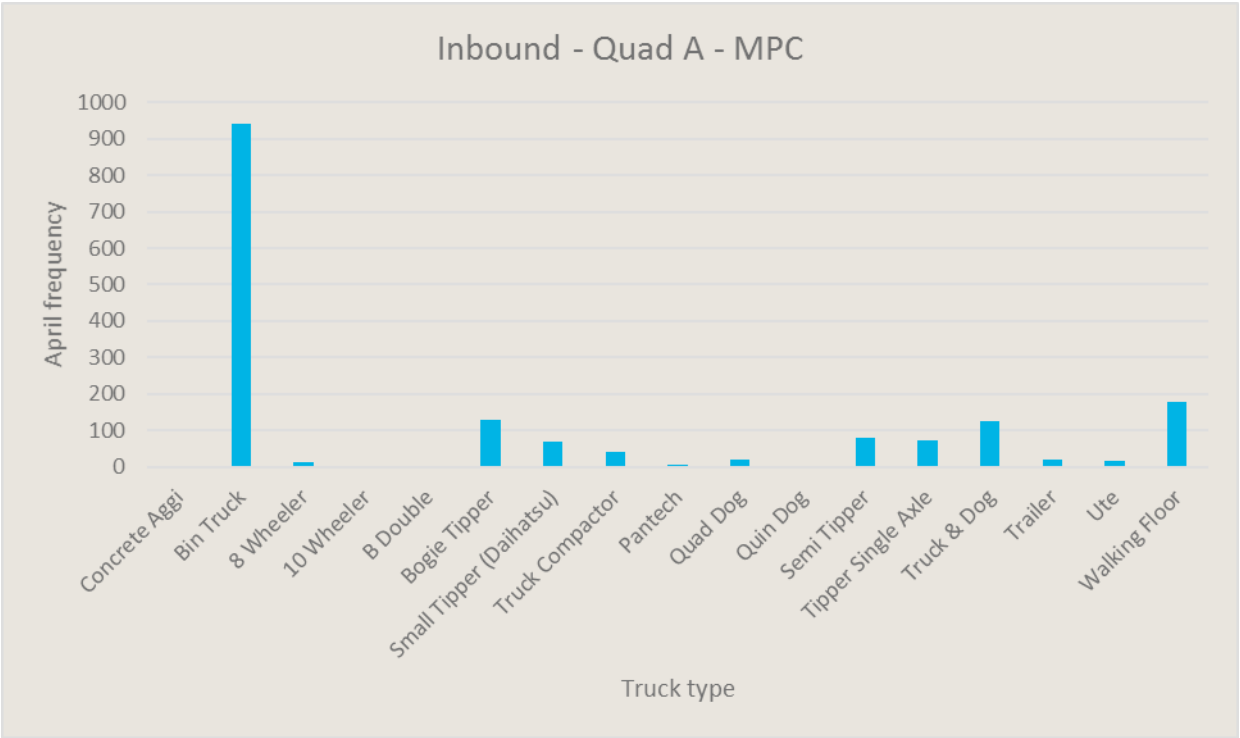
DADI Group Pty Ltd, Environmental Management Strategy; Leachate Collection Conveyance and Management System, Revised 16 March 201

Appendix C

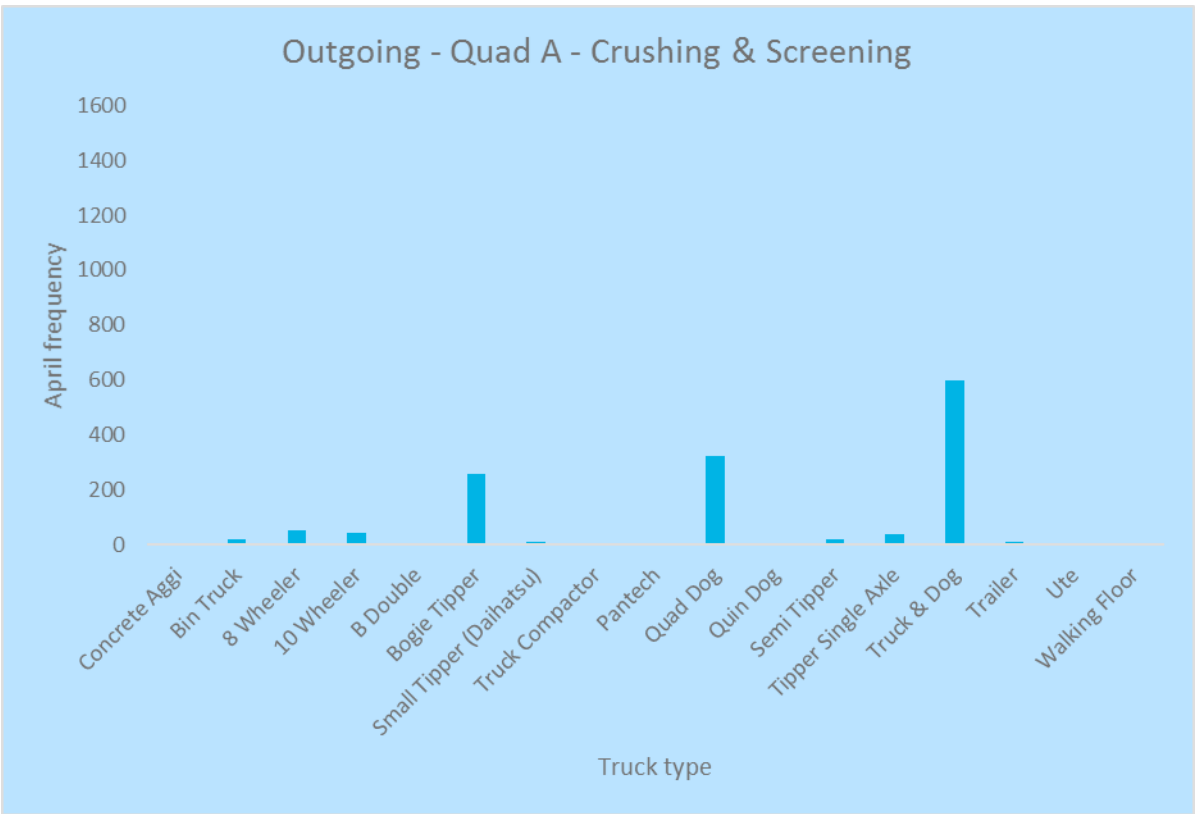
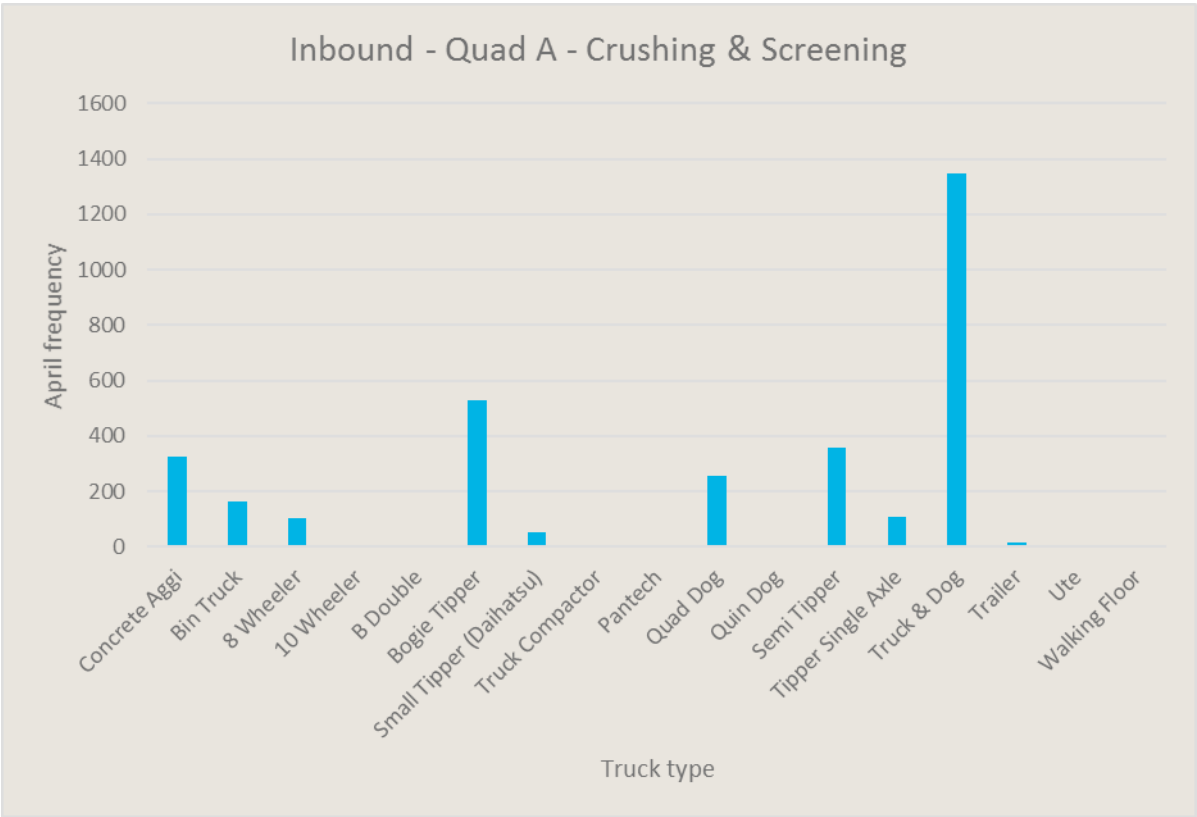
Traffic

C.1 Truck types and numbers

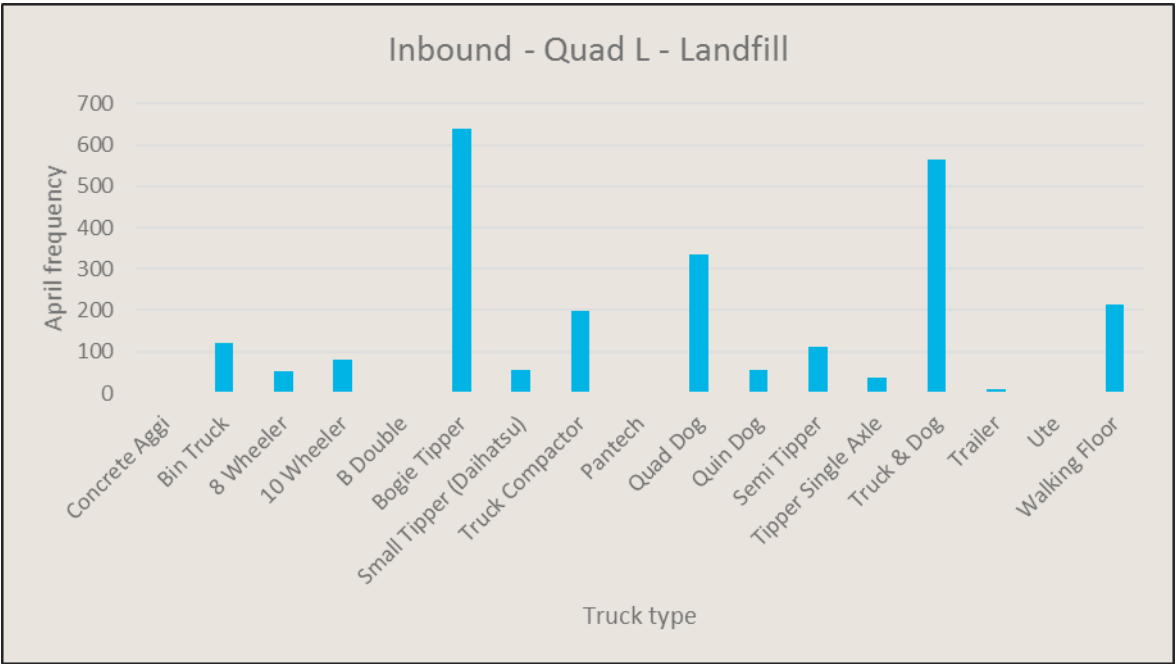
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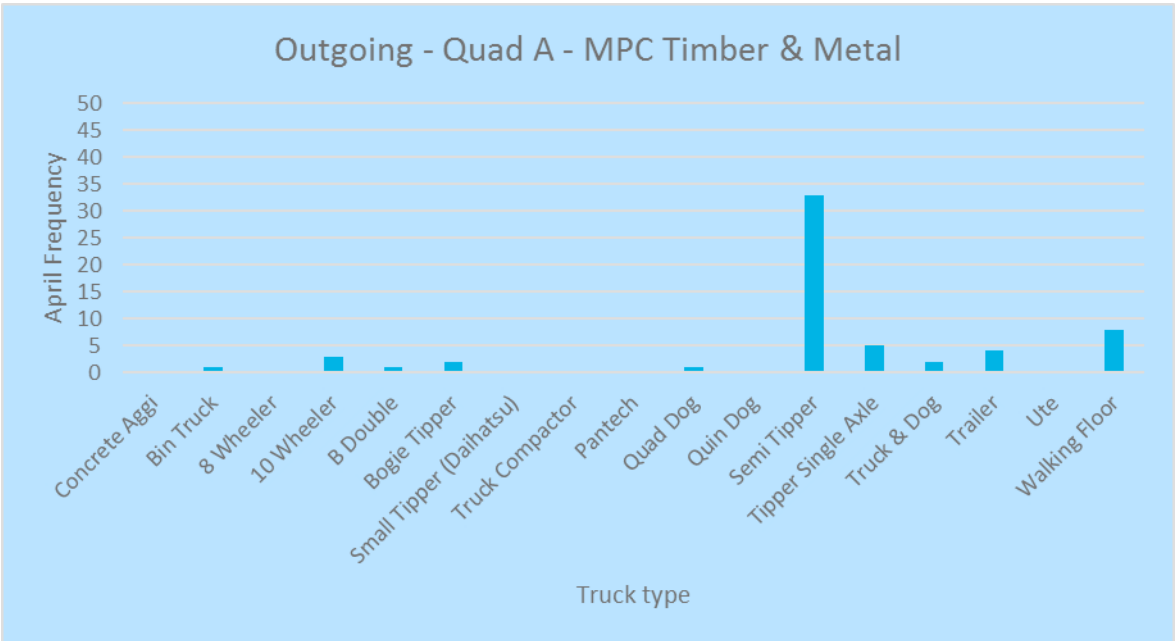
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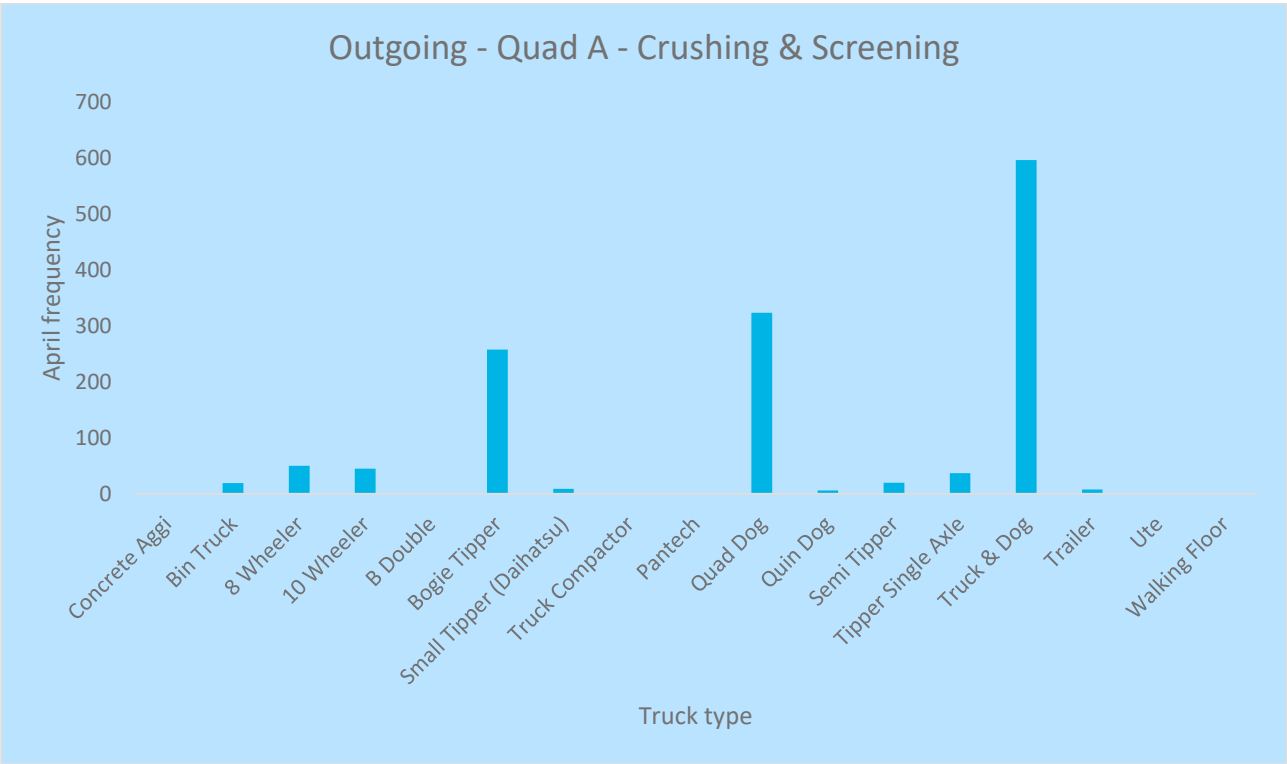
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Appendix D

Letter directing the preparation of a Response to Submissions report



Planning &
Environment

Planning Services

Industry Assessments

Contact: Bianca Thornton

Phone: 02 8217 2040

Email: bianca.thornton@planning.nsw.gov.au

Our Ref: 06_0139 MOD 6

1/11/2018

Allan Young
EMM Consulting c/o Dial-A-Dump Industries
PO Box 21
St Leonards NSW 1590

Email: ayoung@emmconsulting.com.au

Dear Mr Young

**Response to Submissions
Genesis Waste Management Facility (06_0139 MOD 6)**

The exhibition of the modification request for the above project ended on Wednesday 17 October 2018. All submissions received by the Department during the exhibition of the project are available on the Department's website at:

http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8319

The EPA has advised they will commenting on the Air Quality Impact Assessment and these comments will be provided to you as soon as possible.

The Department requires that you provide a written response to each of the issues raised in a Response to Submissions (RTS) report. In addition, it is requested you address the issues raised by the Department in **Attachment 1**. Your RTS should include any revised management and mitigation measures, if considered necessary.

It would be appreciated if you could provide your RTS within two months of the date of this letter. If you have any questions, please contact Bianca Thornton on the details listed above.

Yours sincerely

Kelly McNicol
**Team Leader, Industry Assessments
Planning Services**

ATTACHMENT 1

The Department of Planning and Environment has reviewed the Environmental Assessment (EA) prepared by EMM dated 30 August 2018, and requires that the following issues be fully addressed in a Response to Submissions report:

General

- The EA states that several landfills have recently closed and many more are slated for closure. Provide details of these landfills.
- How will the proposed modification impact the life expectancy of the landfill?

Traffic and parking

- The Traffic Impact Assessment (TIA) references removal of the landfill limit, which was previously proposed at the Request for SEARs stage. The TIA should be consistent with the EA (which proposes a 1,000,000 tpa direct-to-landfill limit) for ease of understanding, particularly as these inconsistencies raised concerns for nearby community members.
- Section 3.1 and 4.1 of the TIA makes statements that the daily truck movements 'will remain within the maximum limit inferred through the condition limiting incoming waste volumes to 2 Mtpa.' This is misleading and implies an unlimited amount of traffic generated from the facility is permitted so long as the facility stays within the 2,000,000 tpa limit.
- The EA indicates there will be an increase in 492 truck movements per weekday, during the evening and night time periods on a weekday, and 20 light vehicle movements per weekday.
 - Please provide further breakdown of how the number of future vehicle movements has been calculated.
 - Estimated vehicle movements for the weekends have not been provided.
 - Further clarity is required regarding the split of types of trucks and how many trucks both tip and pick up waste.
 - Provide rationale for how there will be an increase of 492 truck movements per day if the facility limit will not change from 2,000,000 tpa.
- Section 4.3 of the EA mentions parking is 'generally adequate' and the employee numbers will marginally change.
 - Elaborate on how all parking associated with the facility will be wholly contained within the site. No provision appears to have been made for shift changeover times when there would be an overlap of arriving and departing staff.
 - Provide an estimated number of additional jobs.
- The TIA focusses on traffic impacts on surrounding intersections during the peak commuter traffic hours. Further assessment should be undertaken on the operational traffic impacts on the surrounding industrial estate road users and businesses during their hours of operation. Traffic within the industrial estate was identified as an existing issue by community members.
- Identify the night time haul routes.

Air Quality and Odour

- The worst-case scenario utilised in the Air Quality Impact Assessment (AQIA) assumes that 1,000,000 tpa of waste is landfilled and 1,000,000 tpa of waste is recycled. Section 1.1 of the EA states that approximately 30% of the waste that is processed through the MPC is residual waste and is landfilled. On this basis, the worst-case scenario would be 1,300,000 tpa landfilled and 1,000,000 tpa recycled (ie. processed through the MPC).
- Section 8 of the AQIA states that the Proponent *will consider* relocating the PM₁₀ monitoring site in Minchinbury. Provide confirmation whether the Proponent will relocate the monitoring site. Given the concerns raised by the community relating to air quality and human health, additional information is required on the proposed measures to minimise and mitigate air quality impacts.
- Several public submissions identified odour emanating from the site as an issue. Elaborate on the mitigation measures for greenwaste and composting.

Noise

- Similar to the TIA, the Noise Impact Assessment (NIA) references removal of the landfill limit which is inconsistent with the EA.
- Similar to the AQIA, the worst-case scenario is based on a 50/50 split of landfilling and recycling.
- Background noise levels are based on measurements from 2014. This is considered outdated as there has been several developments adjacent to the Genesis site since the noise measurements were taken (depicted in the figure below).
- The predicted operational noise utilises data from an EMM database. Provide justification for why direct measurements of the existing plant and equipment was not used for all operational noise sources.
- Section 5.3 of the NIA states that main noise source was from truck movements. The TIA estimates an additional 492 truck movements per weekday during the evening and night period. Night time noise was raised as a key concern for the community. Information on the proposed measures to minimise, mitigate and monitor increased noise levels, particularly during the evening and night period, is required.



Appendix E

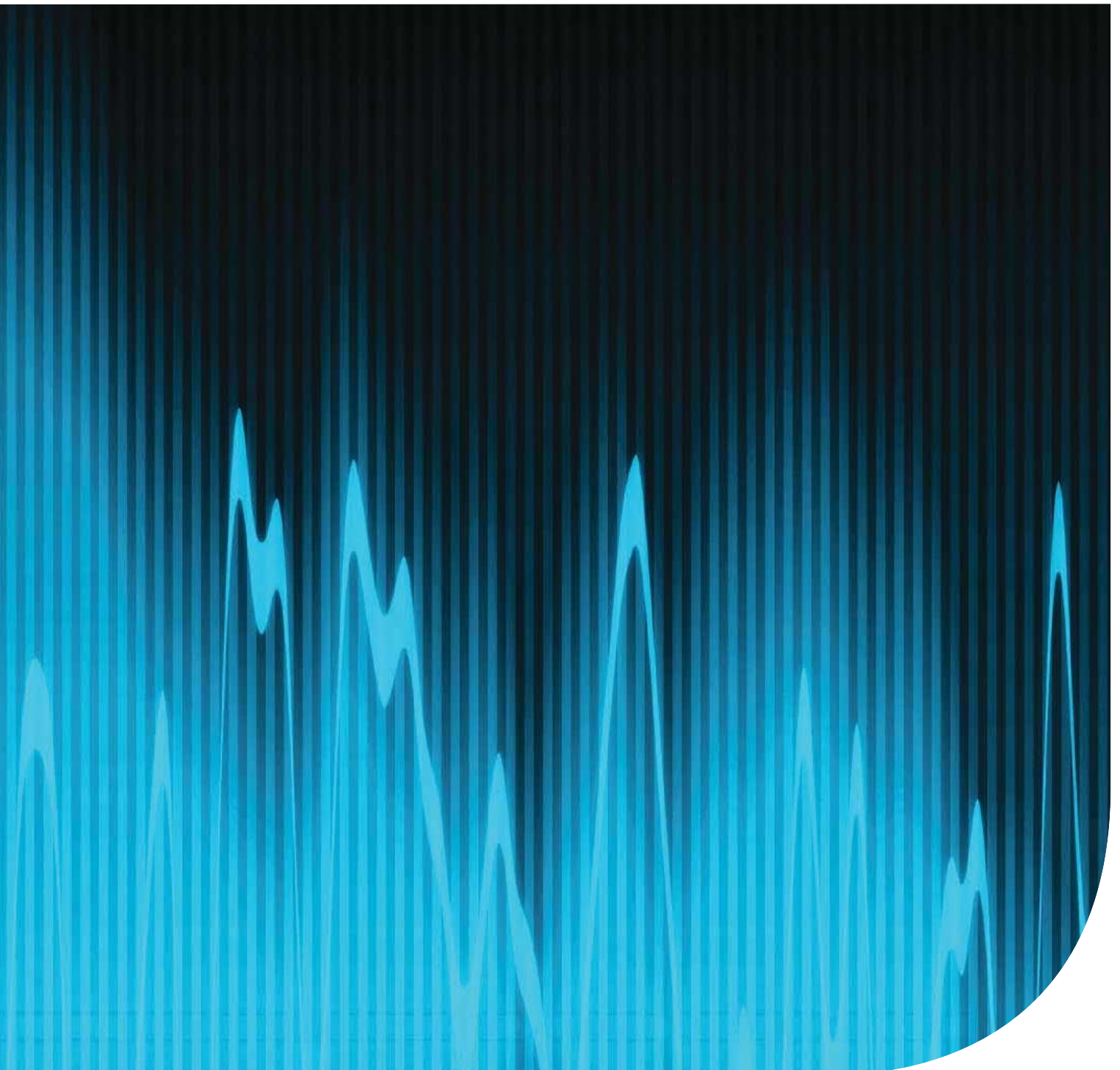
Addenda

E.1 Noise Impact Assessment Report

Genesis Xero Waste

Noise and Vibration Impact Assessment | Modification 6

Prepared for Dial A Dump Industries Pty Limited | 15 August 2018





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Genesis Xero Waste

Final

Report J17117RP1 | Prepared for Dial A Dump Industries Pty Limited | 15 August 2018

Prepared by **Katie Teyhan**

Approved by **Najah Ishac**

Position Associate Consultant

Position Director

Signature



Signature



Date 15/08/2018

Date 15/08/2018

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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Document Control

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V4	15 August 2018	Katie Teyhan	Najah Ishac



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1 Introduction

1.1 Background

The Proponent operates the Genesis Xero Waste Facility (the Facility) at Eastern Creek in the Blacktown Local Government Area (LGA). The Facility is located at 1 Kangaroo Avenue and comprises a Resource Recovery Facility (RRF) and a general solid waste (non-putrescibles) landfill. The RRF includes a Materials Processing Centre (MPC) and a Waste Transfer Station. The site currently operates under project approval MP 06_0139 and environment protection licences (EPLs) 13426 and 20121.

The proponent proposes to modify MP 06_0139 to alter the hours of operation and increase the yearly limit on the quantity of waste that can be landfilled. This modification will be known as Modification 6. This will enable the Facility to accept the waste streams that will be generated during major construction projects, some of which will be generated outside standard construction hours. This would not necessitate any modifications/alterations to the existing site infrastructure, production equipment or approved Facility footprint.

This report presents the results and findings of a noise assessment which has been prepared to accompany the modification with reference to the following guidelines and policies:

- the *NSW Industrial Noise Policy* (EPA 2000) (INP);
- the *NSW Industrial Noise Policy Application Notes* (EPA 2013);
- the *NSW Road Noise Policy* (EPA 2011) (RNP); and
- *State Environmental Planning Policy (SEPP) 59 – Eastern Creek Precinct Plan (Stage 3)* (Blacktown City Council 2005).

This noise assessment also evaluates the existing level of noise from the site in accordance with the methodology outlined in the INP and associated Application Notes for the assessment of noise from existing industrial premises.

1.2 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs) were issued for the proposed modification. The noise specific requirements and where they have been addressed in this NIA are provided in Table 1.1.

Table 1.1 SEARs

Key issue	Requirement	Section addressed
Department of Planning & Environment		
Noise	An assessment of any potential impacts as a result of noise and vibration on all surrounding receivers, and including an assessment based on the EPA's <i>NSW Road Noise Policy</i> .	Section 5
NSW Environment Protection Authority		
Noise	Noise and vibration Impacts on all receivers from not only on site activities but also from traffic on local roads.	Section 5
Blacktown City Council		
Noise	An acoustic assessment must be conducted that explicitly outlines the expected noise levels at all affected receivers, and satisfies the noise criteria outlined in the EPA Licence 2012.	Section 5
	24 hour maintenance work in the landfill may create problems as the repair and maintenance of machines could be used to conceal landfilling operations, which would certainly have an impact on the ability to meet noise criteria.	Section 5.3

1.3 Glossary of acoustic terms

A number of technical terms are required for the discussion of noise. These are explained in Table 1.2.

Table 1.2 Glossary of acoustic terms

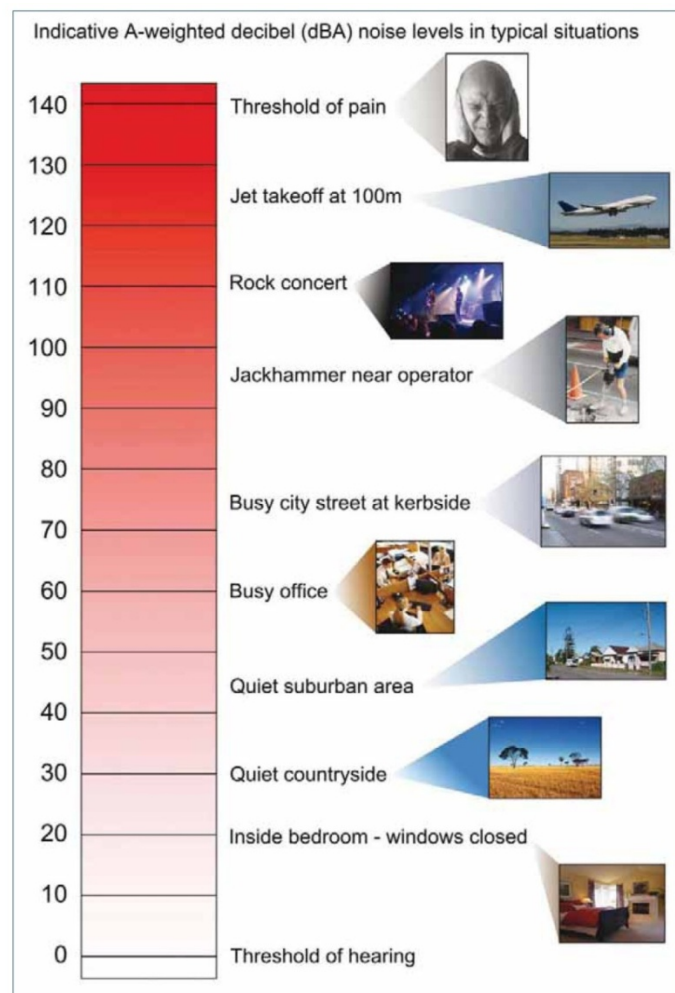
Term	Description
dB	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
L _{A1}	The noise level exceeded for 1% of a measurement period.
L _{A10}	A noise level which is exceeded 10% of the time. It is approximately equivalent to the average of maximum noise levels.
L _{A90}	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
L _{Aeq}	It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period. The L _{eq,15 minute} descriptor refers to an Leq noise level measured over a 15-minute period.
L _{Amax}	The maximum root mean squared sound pressure level received at the microphone during a measuring interval.
L _{Amin}	The minimum root mean squared sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period.
Sound power level	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.
Temperature inversion	A positive temperature gradient. A meteorological condition where atmospheric temperature increases with altitude.

It is useful to have an appreciation of decibels, the unit of noise measurement. Table 1.3 gives an indication as to what an average person perceives about changes in noise levels.

Table 1.3 Perceived change in noise

Change in noise level (dB)	Perceived change in noise
Up to 2	typically indiscernible
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times (or quarter) as loud

Examples of common noise levels are provided in Figure 1.1.



Source: Road Noise Policy (Department of Environment, Climate Change and Water (DECCW) 2011).

Figure 1.1 Common noise levels

2 Project and site description

2.1 Background

The site is located at the end of Honeycomb Drive on Lot 1 DP 1145808 and Lot 8 DP 1200048 in Eastern Creek, which is in the Blacktown LGA, as shown in Figure 2.1. The site is surrounded by Kangaroo Avenue to the east and north-east, the Western Motorway to the north, Archbold Road to the west and open grassland to the south.

Further afield there is the residential suburb of Minchinbury beyond the Western Motorway to the north and in Erskine Park beyond Archbold Road to the west, and predominantly undeveloped land containing high voltage powerlines to the west and south-west.

The site is permitted to receive and process 2 million tonnes per annum (Mtpa) of construction, demolition, commercial and industrial waste and green waste clean ups for resource recovery and landfill. A total of 700,000 tpa of resource recovery process rejects and special waste (asbestos) is currently permitted to be sent to landfill at the site. The Facility comprises:

- access and internal roads;
- weighbridge and material inspection area;
- materials processing centre (MPC) and approved but yet to be constructed pre-sort enclosure (PSE) which are large sheds where material is unloaded and fed into the processing plant;
- segregated material area (SMA) where materials such as bricks, concrete and sand are stockpiled directly from client trucks or from the MPC and reprocessed into saleable products such as aggregates and sands; and
- asbestos discovered during pre-processing and landfill rejected during the resource recovery process are applied to the base of a former quarry. Incoming loads pre-classified as special waste are directed straight to the landfill for immediate disposal and covering.

2.2 The proposal

The purpose of Modification 6 is to modify the operational hours and to allow greater flexibility in relation to the waste volume permitted to landfill.

For the most part, operations at the Facility will continue in accordance with MP 06_0139, as amended. There will be no modification to the maximum volume of waste that may be accepted in a single year.

The operating hours are proposed to be changed to meet the demand of large infrastructure 24-hour construction projects such as motorways and to enable maintenance and cleaning outside of standard hours so that plant is more available during standard hours. The approved construction and operating hours from the project approval (Table 5 of Condition 39) are reproduced in Table 2.1.

Table 2.1 **Approved hours**

Activity	Days	Hours
Construction	Monday-Friday	7am-6pm
	Saturday	8am-4pm
	Sunday and public holidays	Nil
Operations (waste deliveries and use of chute)	Monday-Friday	7am-6pm
	Saturday, Sunday and public holidays	8am-4pm
Operations (MPC)	Monday-Friday	6am-10pm
	Saturday, Sunday and public holidays	6am-4pm

The proposed operating hours are provided in Table 2.2, and if approved would replace Table 5 of Condition 39.

Table 2.2 **Proposed hours**

Activity	Sub-activity	Days	Hours
Construction		Monday-Friday	6am-6pm
		Saturday	8am-4pm
		Sunday and public holidays	Nil
Operations (waste deliveries, processing and land filling)			
MPC and PSE	Receive materials	Monday-Sunday	24 hours
	Operations	Monday-Sunday	24 hours
SMA	Receive materials	Monday-Sunday	24 hours
	Crushing and screening	Monday-Sunday	6am-6pm
Landfill	Receive materials by truck	Monday-Sunday	5am-9pm
	Convey waste from MPC to landfill via chute	Monday-Sunday	24 hours
Maintenance			
MPC, PSE and Landfill	Repair machinery	Monday-Sunday	24 hours
SMA	Cleaning and machinery repairs	Monday-Sunday	24 hours
Chute	Clearing of blockages and general repairs	Monday-Sunday	24 hours

The limit on landfill volumes of 700,000 tpa is proposed to be increased to 1,000,000 tpa. This will not change the cap on volumes of 2 Mtpa approved to be received at Genesis. Modification of the cap will allow Genesis operational flexibility to meet the increased demand of more special waste during the aforementioned major construction projects.

2.3 Current noise limits

Noise assessment criteria for the site are stipulated in the site's development consent and two EPLs.

2.3.1 Project Approval MP 06_0139

Condition 38 of MP 06_0139 details noise impact assessment criteria for daytime, evening and morning shoulder periods. The condition regarding noise is reproduced as follows:

Noise Impact Assessment Criteria

38. The Proponent shall ensure that noise from the project does not exceed the noise limits in Table 4.

Table 4: Development Noise Limits (dBA)

Location	Day $L_{Aeq,15\text{ minute}}$, dB	Evening $L_{Aeq,15\text{ minute}}$, dB	Morning Shoulder $L_{Aeq,15\text{ minute}}$, dB
Any receiver	37	36	36

38a. Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the latest version of the NSW Industrial Noise Policy.

MP 06_0139 defines day as the period from 7 am to 6 pm on Monday to Saturday, and 8 am to 6 pm on Sundays and Public Holidays, evening as the period from 6 pm to 10 pm and morning shoulder as the period from 6 am to 7 am on Monday to Saturday, and 6 am to 8 am on Sunday and Public Holidays.

2.3.2 EPL 13426 & EPL 20121

Condition L4.1 of EPLs 13426 and 20121 details the site generated noise limits for the nearest affected receivers in Minchinbury and Erskine Park.

Condition L4.1 of EPL 13426 regarding noise is reproduced as follows:

L4.1 Noise generated from the Landfill must not exceed the noise limits presented in the table below:

Residence Location	Day $L_{Aeq,15\text{ minute}}$, dB	Noise Criteria $L_{Aeq,15\text{ minute}}$, dB
Nearest affected receiver (Minchinbury)	36	36
Nearest affected receiver (Erskine Park)	36	36

Condition L4.1 of EPL 20121 regarding noise is reproduced as follows:

L4.1 Noise generated from the Landfill and Resource Recovery Facility must not exceed the noise limits presented in the table below:

Residence Location	Day $L_{Aeq,15\text{ minute}}$, dB	Night $L_{Aeq,15\text{ minute}}$, dB
Nearest affected receiver (Minchinbury)	36	35
Nearest affected receiver (Erskine Park)	36	35

It is of note that EPL 20121 specifies a night-time noise criteria of $L_{Aeq,15\text{ minute}}$ 35 dB while EPL 13426 has no mention of night-time noise criteria. The day-time noise criteria in both EPLs are consistent (ie $L_{Aeq,15\text{ minute}}$ 36 dB). It should also be noted that day and night-time are defined differently in the EPLs.

- In EPL 13426, daytime is not specifically defined however operating hours are defined as 7:00 am to 6:00 pm from Monday to Friday and 8:00 am to 4:00 pm on Saturdays, Sundays and public holidays.

- In EPL 20121, daytime is defined as 6:00 am to 6:00 pm from Monday to Friday and 8:00 am to 4:00 pm on Saturdays, Sundays and public holidays while night-time is defined as 6:00 pm to 6:00 am. This definition appears to include a morning shoulder period.

It is also of note that the noise limits in the project approval are inconsistent with those in the EPLs.

2.3.3 SEPP 59 – Eastern Creek Precinct Plan (Stage 3)

The *SEPP 59 – Eastern Creek Precinct Plan (Stage 3)* is dated December 2005 and hence post dates the EPA's INP (2000). It establishes noise targets for a number of zones within the subject industrial precinct. The criteria or targets provided in SEPP 59 are 'period' based limits, a term that aligns with the INP's amenity criteria. Zone 1 is applicable to the DADI facility and importantly this zone also encompasses existing warehousing type facilities to the north only. No other existing industrial sites form part of Zone 1 and we understand that there are limited opportunities for additional industrial uses to be developed within this zone in the future. Table 1 and Figure 14 of Section 7.8 of *SEPP 59 – Eastern Creek Precinct Plan (Stage 3)* are reproduced as follows:

Table 1 – Optimum noise level goals

Period	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Day	57 dB(A)	54 dB(A)	56 dB(A)	54 dB(A)	49 dB(A)	52 dB(A)
Evening	47 dB(A)	44 dB(A)	46 dB(A)	44 dB(A)	39 dB(A)	42 dB(A)
Night	42 dB(A)	40 dB(A)	40 dB(A)	39 dB(A)	34 dB(A)	37 dB(A)

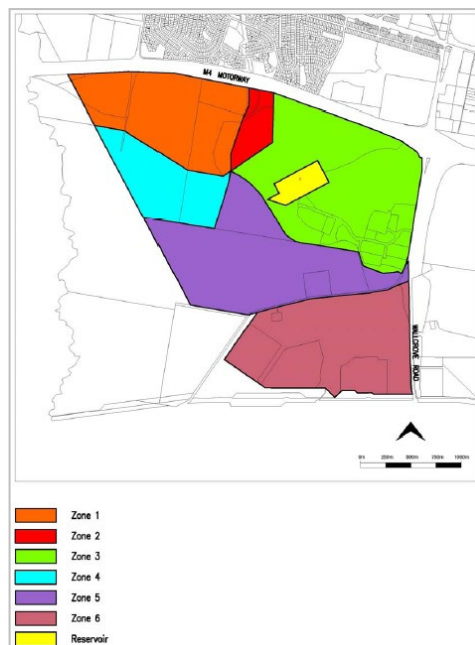


Figure 14 – Noise Emission Zones



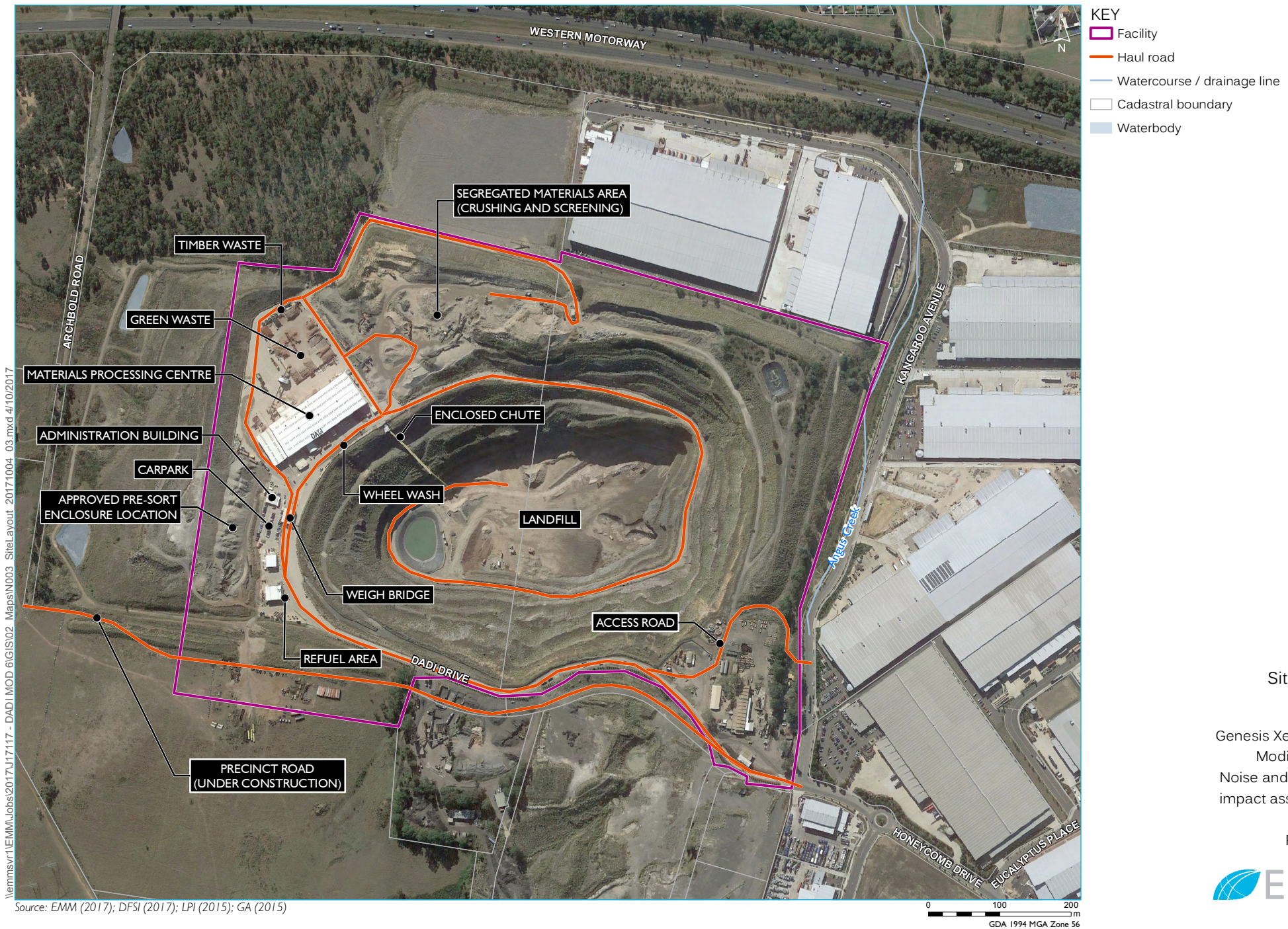
KEY

- Facility
- Assessment locations
- Monitoring location
- Main road
- Local road
- Watercourse

Noise monitoring and assessment locations

Genesis Xero Waste
Modification 6
Noise and vibration
impact assessment

Figure 2.1



Site layout

Genesis Xero Waste
Modification 6
Noise and vibration
impact assessment

Figure 2.2

3 Existing environment

3.1 Noise sensitive receivers

The site is located within an industrial and commercial precinct. The closest residential properties are approximately 400 m to the north of the site on the opposite side of the M4 Motorway. Other surrounding land uses are industrial, with the site directly bounded by industrial properties on the north, east and south. The site's location in its local context can be seen in Figure 2.1.

Nearest representative noise sensitive locations to the site have been identified and are provided in Table 3.1 hereafter referred to in this report as assessment locations. The assessment locations are shown in Figure 2.1.

Table 3.1 Assessment locations

ID	Type ¹	Address
1	Urban Residential	3-21 Cobbler Crescent, Minchinbury
2	Urban Residential	1-7 Tod Place, Minchinbury
3	Urban Residential	1-6 Eber Place, Minchinbury
4	Urban Residential	158-192 McFarlane Drive, Minchinbury
5	Urban Residential	1-10 Bergin Place, Minchinbury
6	Urban Residential	2-22 Barossa Drive, Minchinbury
7	Urban Residential	3-11 Rookin Place, Minchinbury
8	Urban Residential	1-8 Rutherglen Place, Minchinbury
9	Suburban Residential	2-44 Warbler Street, Erskine Park
10	Suburban Residential	1-19 Swamphen Street, Erskine Park
11	Suburban Residential	3-8 Blackbird Glen, Erskine Park
12	Industrial	21 Kangaroo Avenue, Eastern Creek
13	Industrial	17 Kangaroo Avenue, Eastern Creek
14	Industrial	16 Kangaroo Avenue, Eastern Creek
15	Industrial	12 Kangaroo Avenue, Eastern Creek
16	Industrial	4 Kangaroo Avenue, Eastern Creek
17	Industrial	1 Eucalyptus Place, Eastern Creek
18	Industrial	2 Grevillea Street, Eastern Creek
19	Industrial	Proposed Hanson Concrete & Asphalt Facility - Lot 1, Kangaroo Avenue, Eastern Creek
20	Industrial	Proposed Warehousing Facility - Lot 6, Kangaroo Avenue, Eastern Creek
21	Industrial	Fulton Hogan Asphalt - Dadi Drive, Eastern Creek
22	School	202 McFarlane Drive, Minchinbury
23	School	53 Peppertree Drive, Erskine Park

Notes: 1. As defined in the INP.

3.2 Existing noise levels

A key element in assessing potential noise impacts from industry is to quantify the existing ambient acoustic environment, including any existing industrial noise where present.

Existing ambient noise levels for the residential areas to the north (Minchinbury) and west (Erskine Park) of the site have previously been measured and reported in *Energy from waste Facility, Eastern Creek (SSD6236) – Noise Impact assessment* prepared by Pacific Environment (October 2016). These unattended noise monitoring locations are shown in Figure 2.1. Monitoring was undertaken in March and April 2014. No significant changes have occurred in the area that would be expected to impact ambient noise levels since the noise monitoring was undertaken. Traffic noise may have increased slightly and some increased industrial development in the area may have the effect of increasing ambient noise levels. As such, use of noise levels measured in 2014 to determine intrusive noise goals is considered a conservative approach and suitable for the purpose of this assessment.

The existing ambient noise levels measured by Pacific Environment are presented in Table 3.2. The results are presented in the metrics of Rating Background Level (RBL) and L_{Aeq} . The RBL is an overall single value background level representing each assessment period (ie day, evening or night) over the whole monitoring period. It is an INP term and is used to represent the background noise level when assessing industrial noise. The L_{Aeq} is the A-weighted energy average noise level, and it represents the equivalent continuous sound pressure level over a given period.

Table 3.2 Summary of existing and ambient background noise levels

Monitoring Location (refer to Figure 2.1)	Period ¹	RBL ² , dB	Ambient $L_{Aeq, period}$ noise level ³ , dB
BG1 (24 Cobbler Crescent, Minchinbury)	Day	43	55
	Evening	48	54
	Night	41	51
BG2 (4 Blackbird Glen, Erskine Park)	Day	37	53
	Evening	44	57
	Night	35	46

Notes

1. Day: 7 am - 6 pm Monday - Saturday; 8 am - 6 pm Sundays and public holidays; Evening: 6 pm - 10 pm; Night: all remaining periods.
2. RBL is the overall single figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
3. Represents the energy average noise level over the relevant period.
4. Source: Pacific Environment (2016)

3.3 Attended noise monitoring

3.3.1 Methodology

Operator attended noise measurements are used to quantify and document the existing noise sources including the existing industrial noise contribution during the relevant periods. Operator attended noise measurements have previously been measured and reported in the *Energy from waste Facility, Eastern Creek (SSD6236) – Noise Impact assessment* prepared by Pacific Environment (October 2016). These attended noise monitoring locations are shown in Figure 2.1 and are consistent with the unattended noise monitoring locations.

3.3.2 Attended noise monitoring results

The attended noise monitoring results from the Pacific Environment report are summarised in Table 3.3.

Table 3.3 Attended noise measurements

Location	Time	Period	Noise measurement, dB		Existing industrial noise contribution, dB	Comments
			L _{Aeq,15 minute}	L _{A90,15 minute}	L _{Aeq,period}	
BG1	18/3/14 11:57	Day	50	47	Nil	Noise environment dominated by road traffic from M4. Other sources included some community noise (hammering and dog barking) and occasional bird calls. Industrial noise was not noted.
BG1	18/3/14 20:20	Evening	47	45	Nil	Noise environment dominated by road traffic noise from M4, distant traffic on the Great Western Highway and insect noise. Industrial noise was not noted.
BG1	19/3/14 00:37	Night	51	48	<41	Noise environment dominated by road traffic noise from M4. Some distant industrial noise from directly west of monitoring location estimated at <41 dB. Insect noise was also audible.
BG2	18/3/14 13:03	Day	47	40	Nil	Noise environment consisted of constant distant road traffic noise from M4, occasional community noise and birds, frogs and insects and cicadas. Industrial noise was not noted.
BG2	18/3/14 19:34	Evening	55	53	Nil (See comments)	Noise environment dominated by frogs and insects, road traffic noise. Other sources noted included community noise and one occurrence of tonal reversing alarm at <47 dB.
BG2	19/3/14 00:05	Night	50	49	Nil	Noise environment dominated by frogs and insects. Other sources noted included road traffic and community noise. Industrial noise was not noted.

Several industrial developments currently operate in the area surrounding the site, including major industrial areas to the east, south east and south west. Observations outlined in the Pacific Environment report suggest the noise environment at BG1 is dominated by road traffic on the M4 Motorway during all periods. An industrial noise contribution (unrelated to the subject site) was noted to be present from the industrial area to the west of BG1 and was estimated at $L_{Aeq,period} < 41$ dB during the night-time period.

The noise environment at BG2 was noted to consist of distant road traffic noise from the M4 Motorway and noise from birds, frogs and insects. No industrial contribution was noted at this location.

3.4 Meteorology

Noise propagation over distance can be significantly affected by the prevailing weather conditions. Of most interest are source to receiver winds, the presence of temperature inversions and drainage flow effects, as these conditions can enhance received noise levels. To account for these phenomena, the INP specifies meteorological analysis procedures to determine the prevalent weather conditions.

3.4.1 Prevailing winds

The INP recommends consideration of wind effects if they are a “feature” of the area. The INP defines “feature” as the presence of source-to-receiver winds at speeds up to 3 m/s (measured at 10 m above ground level), occurring for 30% of the time in any assessment period and season.

This is further clarified by defining source-to-receiver wind direction as being the directional component of wind. The INP states that where wind is identified to be a feature of the area then assessment of noise impacts should consider the highest wind speed below 3 m/s, which is considered to prevail for at least 30% of the time.

A thorough review of the vector components of the 15-minute wind data was undertaken using 5 years of data (2012-2017) from the Bureau of Meteorology (BoM) Horsley Park AWS (Station 067119), located approximately 6 km south-south-east of the subject site. The analysis shows that the frequency of occurrence of winds up to 3 m/s triggers the 30% INP assessment requirement for all assessment periods (ie day, evening and night). These can be seen in Table 3.4.

3.4.2 Temperature inversions

Temperature inversions (ie where atmospheric temperature increases with altitude) typically occur during the night-time period in the winter months and can also increase (ie focus) noise levels at surrounding assessment locations. As per the INP, temperature inversions are to be assessed when they are found to occur for 30% of the time (about two nights per week) or greater during the winter months. The INP also states that the assessment of the impact of temperature inversions be confined to the night-time noise assessment period where temperature inversions occur.

The frequency of temperature inversions was determined based on sigma-theta data obtained from the BoM Horsley Park AWS. Analysis of the data found that F or G stability class (temperature inversions) may occur for greater than 30% of the night-time period and, as such, have been considered in the prediction and assessment of noise emissions for the night-time period.

3.4.3 Drainage winds

The INP states that a default drainage wind value should be applied where sources are at a higher altitude than the assessment location with no intervening topography. All assessment locations are either at a similar or higher elevation than the subject site or, where they are lower (i.e. the receptors to the west of the site), there is intervening topography between the noise sources and receptors. Therefore, drainage winds have not been adopted in this assessment.

3.4.4 Assessed meteorological conditions

Predicted operational noise levels from the site have been calculated based on the meteorological parameters shown in Table 3.4.

Table 3.4 Weather conditions considered in noise modelling

Assessment period	Meteorological condition	Air temperature	Relative humidity	Wind speed ¹	Direction	Stability category (temperature gradient)
Day	Calm	20°C	70%	0 m/s	n/a	D class
Day	Winds	20°C	70%	1.9 m/s	292.5° to 315°	D class
Evening	Calm	10°C	90%	0 m/s	n/a	D class
Evening	Winds	10°C	90%	2.4 m/s	67.5° to 292.5°	D class
Night/Morning shoulder	Calm	10°C	90%	0 m/s	n/a	D class
Night/Morning shoulder	Winds	10°C	90%	2.5 m/s	157.5° to 315°	D class
Night/Morning shoulder	Temp. inversion	10°C	90%	0 m/s	n/a	F class

Note 1. Based on the 10th percentile wind speed of all winds present for 30% of the time during the relevant period.

4 Assessment criteria

4.1 Industrial noise

Noise from industrial sites or processes in NSW are regulated by the local council, DP&E and/or the NSW Environment Protection Authority (EPA) and usually have a licence and/or approval conditions stipulating noise limits. These limits are normally derived from operational noise criteria applied at assessment locations. They are based on INP guidelines (EPA 2000) or noise levels that can be achieved at a specific site following the application of all reasonable and feasible noise mitigation.

The INP guidelines for assessing industrial facilities have been used for this assessment. With respect to the criteria, the guidelines state:

They are not mandatory, and an application for a noise producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development.

The objectives of noise assessment criteria for industry are to protect the community from excessive intrusive noise and to preserve amenity for specific land uses.

To ensure these objectives are met, the EPA provides two separate criteria: intrusiveness criteria and amenity criteria. The fundamental difference being intrusiveness criteria apply over 15 minutes in any period (day, evening or night), whereas the amenity criteria apply to the entire assessment period (day, evening or night).

4.1.1 Intrusiveness

The intrusiveness criteria require that $L_{Aeq,15\text{ minute}}$ noise levels from the subject site during the relevant operational periods (ie day, evening and night) do not exceed the RBL by more than 5 dB.

The RBLs for the evening period have been adjusted in accordance with the INP application notes. In this regard, the INP application notes state:

In determining project-specific noise levels from the RBLs, the community's expectations also need to be considered. The community generally expects greater control of noise during the more sensitive evening and night-time periods than the less sensitive daytime period. Therefore, in determining project-specific noise levels for a particular development, it is generally recommended that the intrusive noise level for evening be set at no greater than the intrusive noise level for daytime. The intrusive noise level for night-time should be no greater than the intrusive noise level for day or evening.

Table 4.1 presents the intrusive noise criteria determined for the site based on the adopted RBLs.

Table 4.1 Intrusive noise criteria

Location	Period ¹	Measured RBL, dB(A)	Adopted RBL, dB(A)	Intrusive criteria dB, L _{Aeq,15 minute}
Residential assessment locations (Minchinbury) (1-8)	Day	43	43	48
	Evening	48	43 ²	48
	Night	41	41	46
	Morning Shoulder ³	N/A	42	47
Residential assessment locations (Erskine Park) (9-11)	Day	37	37	42
	Evening	44	37 ²	42
	Night	35	35	40
	Morning Shoulder ³	N/A	36	41

Notes: 1. Day: 7 am - 6 pm Monday - Saturday; 8 am - 6 pm Sundays and public holidays; Evening: 6 pm - 10 pm; Night: all remaining periods.

2. The RBL measured for day has been adopted for the evening period in accordance with the INP Application Notes procedures.

3. The RBL adopted for the morning shoulder period has been taken as the midpoint of the RBLs determined for day and night-time periods in accordance with the INP Application Notes.

4.1.2 Amenity

The assessment of amenity is based on noise criteria specific to the land use. The criteria relate only to industrial noise and exclude road or rail noise. Where the measured existing industrial noise approaches recommended amenity criteria, it needs to be demonstrated that noise levels from new industry will not contribute to existing industrial noise.

Residential assessment locations in Minchinbury (assessment locations 1-8) that are potentially affected by the modification have been categorised in the INP (EPA 2000) urban amenity category as they are dominated by 'urban hum' and through traffic with heavy and continuous traffic flows during peak periods, while residential assessment locations in Erskine Park (assessment locations 9-11) have been categorised in the INP (EPA 2000) suburban amenity category due to its intermittent traffic flows and limited commerce/industry. The corresponding recommended amenity criteria for the project are given in Table 4.2.

Table 4.2 **Amenity criteria**

Assessment location	Indicative area	Time period	Recommended noise level dB, $L_{Aeq,period}$	
			Acceptable	Maximum
All residential areas	Urban	Day	60	65
		Evening	50	55
		Night	45	50
	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
Commercial Premises	All	When in use	65	70
Industrial Premises	All	When in use	70	75
School Classroom ²	All	Noisiest 1-hour period when in use	35 $L_{Aeq,1\text{ hour}}$ (internal) 45 $L_{Aeq,1\text{ hour}}$ (external)	40 $L_{Aeq,1\text{ hour}}$ (internal) 50 $L_{Aeq,1\text{ hour}}$ (external)

Notes: 1. Day: 7 am - 6 pm Monday - Saturday; 8 am - 6 pm Sundays and public holidays; Evening: 6 pm - 10 pm; Night: all remaining periods.

2. External noise criteria based on internal criteria as recommended in the INP + 10 dB.

If existing industrial noise approaches the acceptable amenity criteria in Table 4.2, the criteria for the project is to be adjusted to ensure the total industrial level does not exceed the acceptable amenity criteria. This is achieved by applying modification factors to the recommended criteria which are reproduced from Table 2.2 of the INP in Table 4.3 below.

Table 4.3 **Modification to acceptable noise level (ANL)* to account for existing levels of industrial noise**

Total existing L_{Aeq} noise level from industrial noise sources	Maximum L_{Aeq} noise level for noise from new sources alone, dB
$\geq$ Acceptable noise level plus 2 dB	If existing noise level is likely to decrease in future acceptable noise level minus 10 dB If existing noise level is unlikely to decrease in future existing noise level minus 10 dB
Acceptable noise level plus 1 dB	Acceptable noise level minus 8 dB
Acceptable noise level	Acceptable noise level minus 8 dB
Acceptable noise level minus 1 dB	Acceptable noise level minus 6 dB
Acceptable noise level minus 2 dB	Acceptable noise level minus 4 dB
Acceptable noise level minus 3 dB	Acceptable noise level minus 3 dB
Acceptable noise level minus 4 dB	Acceptable noise level minus 2 dB
Acceptable noise level minus 5 dB	Acceptable noise level minus 2 dB
Acceptable noise level minus 6 dB	Acceptable noise level minus 1 dB
< Acceptable noise level minus 6 dB	Acceptable noise level

Notes: * ANL = recommended acceptable L_{Aeq} noise level for the specific receiver, area and time of day from Table 4.2 .

4.1.3 SEPP 59

The *SEPP 59 – Eastern Creek Precinct Plan (Stage 3)*, dated December 2005, establishes noise targets for Zone 1 as described earlier. The Zone 1 optimum noise level goals for the daytime, evening and night periods are reproduced in Table 4.4.

Table 4.4 SEPP 59 – Optimum noise level goals

Assessment location	Indicative area	Time period	Optimum noise level goal, dB, $L_{Aeq,period}$
All residential assessment locations	Zone 1	Day	57
		Evening	47
		Night	42

4.1.4 Project specific noise level

The project specific noise level (PSNL) is the most stringent of either the calculated intrusive or amenity criteria. The PSNL for the daytime, evening and night periods are indicated in Table 4.5. The SEPP 59 target noise levels have been adopted and are comparable to the INP amenity criteria. These apply to all industrial sites in Zone 1, however the subject site dominates the emission levels from this zone with limited opportunities for additional future sites.

Table 4.5 Project specific noise levels

Assessment location	Period	Intrusive criteria, dB, $L_{Aeq,15\text{ minute}}$	SEPP59 Zone 1 Amenity criteria, dB, $L_{Aeq,period}$	PSNL, dB
Assessment locations 1-8 (Minchinbury residences)	Day	48	57	48 $L_{Aeq,15\text{ minute}}$
	Evening	48	47	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	46	42	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	47	N/A	47 $L_{Aeq,15\text{ minute}}$
Assessment locations 9-11 (Erskine Park residences)	Day	42	57	42 $L_{Aeq,15\text{ minute}}$
	Evening	42	47	42 $L_{Aeq,15\text{ minute}}$
	Night	40	42	40 $L_{Aeq,15\text{ minute}}$ ¹
	Morning Shoulder	41	N/A	41 $L_{Aeq,15\text{ minute}}$
Commercial premises	When in use	-	65	65 $L_{Aeq,period}$
Industrial premises	When in use	-	70	70 $L_{Aeq,period}$
Assessment locations 22-23 (School Classrooms)	When in use	-	35 (internal)	35 $L_{Aeq,1\text{ hour}}$ (internal)
			45 (external)	45 $L_{Aeq,1\text{ hour}}$ (external)

Notes: 1. It has been conservatively assumed that $L_{Aeq,period}$ noise levels from site are 3 dB less than the $L_{Aeq,15\text{ minute}}$ noise level. On this basis, an intrusive criterion is equal to an amenity criterion -3 dB.

4.2 Applying INP criteria to existing noise sources

The INP also provides guidance on the application of noise criteria to existing operations such as the Genesis Eastern Creek Facility. Chapter 10 of the INP states:

The application of the criteria to existing sources of noise would occur where significant modifications (such as to warrant serious and/or ongoing development consent or EPA approval) are made to existing developments or where complaints are received. In applying the policy to existing operations it is acknowledged that the scope for applying reasonable and feasible mitigation measures to existing noise sources is usually far more limited than for new developments. Careful consideration of noise impacts and the feasible and reasonable mitigation measures available at these sites may result in less stringent noise limits than would ideally apply. Sometimes the resultant noise limits will be above the criteria.

The INP Application Notes state that if PSNLs are not achieved from existing operations, a preliminary review of feasible and reasonable mitigation measures should be undertaken to identify potential opportunities to reduce existing operational noise levels.

The INP Application Notes state that if the existing premises cannot achieve PSNLs after the feasible and reasonable noise mitigation review, the proposed modification should not significantly increase the existing noise emissions.

4.3 Sleep disturbance criteria

The subject site does not currently operate during the night-time period (10 pm to 7 am) however the Proponent is seeking to modify the existing project approval to allow limited 24 hour operations. Therefore, assessment of sleep disturbance is required in accordance with EPA procedures.

The operational criteria described in Section 4.1, which consider the average noise emission of a source over 15 minutes, are appropriate for assessing noise from generally steady-state sources, such as conveyor noise. However, transient noise from sources such as truck movements is intermittent (rather than continuous) and needs to be assessed using the L_1 or L_{max} noise metrics.

The INP application notes (last updated June 2013) recognise that the current sleep disturbance criteria is not ideal. The assessment of potential sleep disturbance is complex and poorly understood and the EPA believes that there is insufficient information to determine a suitable alternative criteria.

Prior to the EPA determining a standard method to assess the potential for sleep disturbance, the INP application notes suggests that $L_{A1,1 \text{ minute}}$ level of 15 dB above the RBL is a suitable screening criteria for the night-time period. Guidance regarding potential for sleep disturbance is also provided in the *NSW Road Noise Policy* (RNP) (DECCW 2011). The RNP calls upon a number of studies that have been conducted into the effect of maximum noise levels on sleep. The RNP 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 RNP provides the following conclusions from the research on sleep disturbance:

- maximum internal noise levels (L_{Amax}) below 50 to 55 dB are unlikely to awaken people from sleep; and
- one or two noise events per night, with maximum internal noise levels (L_{Amax}) of 65 to 70 dB, are not likely to affect health and wellbeing significantly.

It is commonly accepted by acoustic practitioners and regulatory bodies that a facade including a partially open window will reduce external noise levels by 10 dB. Therefore, external L_{Amax} noise levels in the order of 60 to 65 dB calculated at the facade of a residence are unlikely to cause awakening.

The descriptors L_{max} and L_1 may be considered interchangeable; this approach is accepted by the EPA.

If noise levels over the screening criteria are identified, then additional analysis would consider factors such as:

- how often the events would occur;
- the time the events would occur (between 10 pm and 7 am); and
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods).

Table 4.6 provides the sleep disturbance screening criteria for the residential assessment locations.

Table 4.6 Sleep disturbance screening criteria, residential assessment locations

Assessment location	Adopted RBL, dB	Sleep disturbance criteria dB, L_{Amax}
Assessment locations 1-8 (Minchinbury)	41	56
Assessment locations 9-11 (Erskine Park)	35	50

Notes: 1. The sleep disturbance assessment applies to residential assessment locations only.

4.4 Road traffic noise criteria

Project related traffic is proposed to travel on existing project traffic routes. Project traffic currently travels directly between the site and the arterial road network (M4 and M7 motorways) via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive.

The principle guidance for assessing the impact of road traffic noise is the RNP. Table 4.7 presents the road noise assessment criteria reproduced from Table 3 of the RNP.

Table 4.7 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/development	Assessment criteria, dB	
		Day (7 am to 10 pm)	Night (10 pm to 7 am)
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments.	$L_{Aeq(15-hr)}$ 60 (external)	$L_{Aeq(9-hr)}$ 55 (external)

Source: EPA (2011).

The RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2 dB, after consideration of all feasible and reasonable mitigation measures.

In addition to meeting the assessment criteria, any significant increase in total traffic noise at assessment locations must be considered. Table 4.8 presents the relative increase assessment criteria reproduced from

Table 6 of the RNP. Assessment locations experiencing increases in total traffic noise levels above those outlined in Table 4.8 should be considered for mitigation.

Table 4.8 **Relative increase criteria for residential land uses**

Road category	Type of project/development	Total traffic noise level increase, dB	
		Day (7 am to 10 pm)	Night (10 pm to 7 am)
Freeway/arterial/sub-arterial roads and transitways	New road corridor/redevelopment of existing road/land use development with the potential to generate additional traffic on existing road.	Existing traffic $L_{Aeq(15-hr)} + 12 \text{ dB (external)}$	Existing traffic $L_{Aeq(9-hr)} + 12 \text{ dB (external)}$

Road traffic generated by the proposal travels directly between the site and the arterial road network (M4 and M7 motorways) via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive. There are no residential or other noise sensitive assessment locations located along Kangaroo Avenue, Honeycomb or Wonderland Drives. The proportion of site traffic on the M4 and M7 are inconsequential to average noise levels. Therefore, road traffic noise has not been considered further.

5 Operational noise assessment

5.1 Noise modelling method

This section presents the methods and base parameters used to model and assess the site's predicted noise emissions.

Quantitative modelling of noise emissions was undertaken using Brüel & Kjær Predictor Version 11.00 noise prediction software. This software calculates total noise levels at receptors from the concurrent operation of multiple noise sources. The model incorporates factors such as:

- the lateral and vertical location of plant and equipment;
- source-to-receptor distances;
- ground effects;
- atmospheric absorption;
- topography; and
- meteorological conditions.

Two scenarios were modelled to compare the noise levels from approved and proposed operations for daytime, evening, night-time and morning shoulder periods under calm and prevailing meteorological conditions. Operational modelling scenarios represent a worst-case 15 minute period, with peak truck volumes assumed and all approved/proposed plant and equipment operating concurrently.

5.1.1 Plant and equipment sound power levels

Table 5.1 summarises the operational noise sources and associated sound power levels used in the noise model. The equipment items and quantities are based on the current equipment inventory provided by the Proponent. Sound power levels were based on attended measurements at the site where possible. The sound power levels of plant and equipment that were unable to be measured during the site visit were sourced from an extensive EMM database of similar equipment. These types of plant and equipment have been measured numerous times and the appropriate sound power levels of these items are widely recognised and acknowledged in numerous publications. Section 6.1 of the INP also allows for the situation where project-related noise source data cannot be sourced from direct measurements stating that noise data could also be sourced, for example, from previous Environmental Impact Statements or manufacturer's data.

Noise sources were also examined for the presence of low frequency noise or other characteristics that could cause greater annoyance such as tonality or impulsiveness. Sources typically used at the site did not contain such features and, as such, the application of modifying factors was not considered necessary.

A map of on-site plant and equipment locations is presented in Appendix A.

Table 5.1 Operational plant and equipment sound power levels

Plant and equipment	Quantity (per worst-case 15 minute period)								Sound power level (L _w) per unit, L _{Aeq,15 minute} , dB
	Existing operations				Proposed operations				
	Day	Evening	Night	Morning Shoulder	Day	Evening	Night	Morning Shoulder	
MPC ^{1, 3}	1	1	0	1	1	1	1	1	103
Dozer ²	1	0	0	0	1	1	1	1	116
Front end loader ²	6	0	0	0	6	6	3	6	105
Crusher/Screen/Stacker/Excavator ¹	3	0	0	0	3	0	0	3	113
Compactor ²	3	0	0	0	3	3	0	3	116
Conveyor ²	2	0	0	0	2	2	2	2	102
Truck & Dog/Haul Truck ²	45	0	0	0	58	29	9	29	105 (Driving)/ 97 (Idling)
Maintenance – SMA	1	0	0	0	1	1	1	1	97
Maintenance - Landfill	1	0	0	0	1	1	1	1	97

Notes: 1. L_w calculated from direct measurement during site visit.

2. Taken from EMM database of similar equipment.

3. MPC comprises numerous activities including loading and unloading of trucks, sorting, stockpiling and processing of materials. As these processes occur in an enclosed building, the MPC has been modelled as a single source of noise.

5.1.2 Operating assumptions

In addition to the sound power levels and quantities provided, main operating assumptions adopted for a worst-case 15 minute period are as follows:

- for existing operations:
 - all equipment on-site are assumed to operate continuously in any 15 minutes during the daytime period;
 - only the MPC is assumed to operate continuously in any 15 minutes during the evening and morning shoulder periods;
- for proposed operations:
 - all equipment on-site are assumed to operate continuously in any 15 minutes during the daytime and morning shoulder periods;
 - all equipment on-site with the exception of crushers, screens and associated stackers are assumed to operate continuously in any 15 minutes during the evening period;
 - all equipment on-site with the exception of crushers, screens and associated stackers, compactors and trucks running to landfill are assumed to operate continuously in any 15 minutes during the night-time period;
- all onsite vehicle movements are 20 kilometres per hour (km/hr);
- all trucks on-site are assumed to idle for at least 10% of the 15 minute period; and

- it has been conservatively assumed that $L_{Aeq,period}$ noise levels are 3 dB below the $L_{Aeq,15\text{ minute}}$ noise level from site.

5.2 Noise modelling results

The predicted approved and proposed noise levels at each assessment location for each assessment period are provided in Table 5.2. The results reflect the changes in operating hours and the additional plant described in Table 5.1.

Table 5.2 Predicted site noise emissions - approved and proposed operations

Assessment location	Period	Approved operations, dB		Proposed operations, dB		PSNL, dB
		Calm	Adverse ¹	Calm	Adverse ¹	
1	Day	46	46	47	47	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	43	46	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	37 40	40 43	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	43	46	47 $L_{Aeq,15\text{ minute}}$
2	Day	46	46	47	47	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	44	47	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	38 41	40 43	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	44	47	47 $L_{Aeq,15\text{ minute}}$
3	Day	47	46	48	48	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	44	47	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	38 41	41 44	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	44	47	47 $L_{Aeq,15\text{ minute}}$
4	Day	44	46	45	47	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	42	45	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	36 39	39 42	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	42	45	47 $L_{Aeq,15\text{ minute}}$
5	Day	45	46	45	47	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	43	45	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	36 39	39 42	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	43	45	47 $L_{Aeq,15\text{ minute}}$
6	Day	43	45	43	46	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	40	43	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	<35 37	36 39	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	40	43	47 $L_{Aeq,15\text{ minute}}$
7	Day	45	47	45	47	48 $L_{Aeq,15\text{ minute}}$
	Evening	<35	<35	42	45	48 $L_{Aeq,15\text{ minute}}$ ¹
	Night	N/A	N/A	35 38	38 41	42 $L_{Aeq,period}$ 46 $L_{Aeq,15\text{ minute}}$
	Morning Shoulder	<35	<35	42	45	47 $L_{Aeq,15\text{ minute}}$

Table 5.2 Predicted site noise emissions - approved and proposed operations

Assessment location	Period	Approved operations, dB		Proposed operations, dB		PSNL, dB
		Calm	Adverse ¹	Calm	Adverse ¹	
8	Day	44	47	45	47	48 L _{Aeq,15 minute}
	Evening	<35	<35	42	45	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	35	38	42 L _{Aeq,period}
	Morning Shoulder	<35	<35	38	41	46 L _{Aeq,15 minute}
9	Day	<35	<35	42	45	47 L _{Aeq,15 minute}
	Evening	<35	<35	42	45	47 L _{Aeq,15 minute}
	Night	<35	<35	42	45	47 L _{Aeq,15 minute}
	Morning Shoulder	<35	<35	42	45	47 L _{Aeq,15 minute}
10	Day	39	39	39	39	42 L _{Aeq,15 minute}
	Evening	<35	<35	37	40	42 L _{Aeq,15 minute}
	Night	N/A	N/A	35	37	40 L _{Aeq,15 minute}
	Morning Shoulder	<35	<35	37	37	41 L _{Aeq,15 minute}
11	Day	<35	<35	37	40	42 L _{Aeq,15 minute}
	Evening	<35	<35	37	40	42 L _{Aeq,15 minute}
	Night	N/A	N/A	<35	37	40 L _{Aeq,15 minute}
	Morning Shoulder	<35	<35	37	37	41 L _{Aeq,15 minute}
12	Day	38	38	39	39	42 L _{Aeq,15 minute}
	Evening	<35	<35	37	40	42 L _{Aeq,15 minute}
	Night	N/A	N/A	<35	37	40 L _{Aeq,15 minute}
	Morning Shoulder	<35	<35	37	37	41 L _{Aeq,15 minute}
13	Day	52	52	52	52	70 L _{Aeq,period}
	Evening	<35	<35	49	50	70 L _{Aeq,period}
	Night	N/A	N/A	46	47	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	49	50	70 L _{Aeq,period}
14	Day	41	43	41	44	70 L _{Aeq,period}
	Evening	<35	<35	38	40	70 L _{Aeq,period}
	Night	N/A	N/A	35	38	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	38	40	70 L _{Aeq,period}
15	Day	39	42	40	42	70 L _{Aeq,period}
	Evening	<35	<35	37	40	70 L _{Aeq,period}
	Night	N/A	N/A	<35	37	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	37	40	70 L _{Aeq,period}
16	Day	39	41	39	42	70 L _{Aeq,period}
	Evening	<35	<35	37	39	70 L _{Aeq,period}
	Night	N/A	N/A	<35	36	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	37	39	70 L _{Aeq,period}
17	Day	45	47	46	48	70 L _{Aeq,period}
	Evening	<35	<35	43	45	70 L _{Aeq,period}
	Night	N/A	N/A	38	41	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	43	45	70 L _{Aeq,period}
18	Day	46	48	47	49	70 L _{Aeq,period}
	Evening	<35	<35	44	46	70 L _{Aeq,period}
	Night	N/A	N/A	39	42	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	44	46	70 L _{Aeq,period}

Table 5.2 Predicted site noise emissions - approved and proposed operations

Assessment location	Period	Approved operations, dB		Proposed operations, dB		PSNL, dB
		Calm	Adverse ¹	Calm	Adverse ¹	
18	Day	48	50	49	51	70 L _{Aeq,period}
	Evening	<35	<35	46	48	70 L _{Aeq,period}
	Night	N/A	N/A	41	43	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	46	48	70 L _{Aeq,period}
19	Day	50	52	51	53	70 L _{Aeq,period}
	Evening	<35	<35	48	50	70 L _{Aeq,period}
	Night	N/A	N/A	43	45	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	48	50	70 L _{Aeq,period}
20	Day	57	58	58	59	70 L _{Aeq,period}
	Evening	<35	<35	55	56	70 L _{Aeq,period}
	Night	N/A	N/A	50	50	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	55	56	70 L _{Aeq,period}
21	Day	57	57	58	58	70 L _{Aeq,period}
	Evening	<35	<35	55	56	70 L _{Aeq,period}
	Night	N/A	N/A	50	51	70 L _{Aeq,period}
	Morning Shoulder	<35	<35	55	56	70 L _{Aeq,period}
22	Day	43	44	44	45	45 L _{Aeq,1 hour}
23	Day	<35	<35	35	36	45 L _{Aeq,1 hour}

Notes:

1. Adverse is the worst case result from prevailing winds or temperature inversion conditions at each assessment location. NB daytime adverse winds are favourable in direction for assessment locations in Minchinbury and Erskine Park, hence predicted calm weather results were adopted. Similarly, morning shoulder adverse weather are not applicable for Erskine Park residences given inversions are unlikely to trigger the INP's 30% occurrence threshold and given the assessable wind directions found for the day and night periods which straddles the morning shoulder.
2. Assessment location is a school and therefore operates during the day-time only Notwithstanding, noise levels for all other assessment periods would also satisfy criteria.

5.3 Discussion of results and recommendations

Site noise emissions during proposed operations are predicted to comply with the relevant PSNLs at all assessment locations considered as part of this assessment.

The results of the noise modelling showed that the main noise sources contributing to noise emissions at residential areas were as follows:

- site trucking movements (for residences to the north); and
- site trucking movements and equipment operating in the landfill pit (for residences to the west).

The maintenance of equipment in the landfill pit is not expected to be able to conceal or mask landfilling operations due to the relatively low noise levels of maintenance activity compared to operational activities. Land-filling operations have been included in the modelling and total noise emissions are predicted to comply with the PSNLs for all assessment locations during calm and adverse meteorological conditions for all periods.

In addition, current and future noise levels are predicted to be significantly less than existing ambient noise levels at the residential assessment locations which are primarily dictated by road traffic noise from the M4

motorway. Hence, noise levels from the modification are not expected to cause adverse impacts at any assessment location.

It is of note that the existing noise limits specified in the site's project approval and EPLs are below measured ambient noise levels at the nearest assessment locations. Further, during the site's bi-annual attended noise monitoring, the site's contribution is regularly unable to be quantified due to elevated ambient noise levels at the specified monitoring locations.

It is recommended that the site's noise limits be increased, in line with the highest predicted noise levels or PSNLs adopted for this assessment. INP procedures ensure that appropriate noise criteria (ie PSNLs) are established with a view to maintaining acceptable noise amenity levels at assessment locations and with consideration of potential cumulative noise impacts from existing and/or successive developments.

5.4 Sleep disturbance assessment

The predicted L_{Amax} noise levels from the site at the nearest residential assessment locations are presented in Table 5.3 for worst-case meteorological conditions (ie temperature inversions). The predictions are for the night period only (10 pm to 7 am) coinciding with the typical sleep period and in accordance with the INP.

Typical maximum noise level events include the following:

- trucks dumping;
- front end loader or excavator scraping concrete;
- bangs/hammering associated with maintenance activity; or
- vehicles reversing, inclusive of tonal reversing alarms.

The sound power level of these types of events has been measured to be up to L_{Amax} 126 dB and represents the likely highest maximum noise level events from the site.

Table 5.3 Predicted L_{Amax} noise levels during night period

Assessment location ¹	Predicted L_{Amax} noise levels, dB	L_{Amax} screening criteria, dB
	Worst-case meteorological conditions	
1	51	56
2	51	56
3	53	56
4	48	56
5	49	56
6	44	56
7	47	56
8	47	56
9	44	50
10	42	50
11	41	50

Notes: 1. The sleep disturbance assessment applies to residential assessment locations only.

Noise modelling predicts that L_{Amax} noise levels will satisfy the INP sleep disturbance screening criteria at all residential assessment locations.

5.5 Cumulative noise assessment

Potential cumulative noise impacts from existing and successive developments are considered by the INP procedures by ensuring that the appropriate noise criteria are established with a view to maintaining acceptable noise *amenity* levels. Therefore, the cumulative impact of the Facility with existing industrial noise sources has been assessed in the determination of the acceptable amenity levels at the assessment locations.

It is of note that Hanson currently has approval for the construction and operation of a concrete and asphalt Facility on a site to the south east. *Construction, Operating and Traffic Noise Assessment – Concept Plan for the redevelopment of Lot 11 DP558723, Lot 1 DP200697 and Lot 2 DP262213* (Heggies 2006) indicates that Hanson site noise levels are predicted to comply with all amenity criteria. Further, a noise criterion of $L_{Aeq,15\text{ minute}}$ 35 dB has been applied to the Hansen site for all periods in its project approval.

The Hansen site is proposed to be located outside the Zone 1 as per the SEPP 59 Eastern Creek Precinct Plan (refer Appendix B herein). Therefore, this site is to be assessed against separate noise targets stipulated in the SEPP 59. These noise goals are specified to provide adequate protection to the amenity of surrounding residential areas without unduly restricting the development of, and operations within, the precinct.

Cumulative noise impacts from noise sources within Zone 1 have been assessed in accordance and demonstrate compliance with the Eastern Creek Stage 3 Precinct Plan.

6 Conclusion

EMM has completed a noise assessment for the modification. This noise assessment has been prepared in accordance with the methodology outlined in the INP and associated Application Notes for the assessment of noise from industrial premises.

The Proponent proposes to modify the project approval to alter the hours of operation and to improve flexibility in relation to the waste volume permitted to be landfilled, by removing the annual cap. This would not necessitate any modifications/alterations to the existing site infrastructure, production equipment or approved Facility footprint.

A noise model was developed to compare noise levels from existing approved and proposed operations. The model adopted sound power levels of key acoustically significant plant and equipment derived from attended site measurements and a database of similar equipment.

For the assessment of proposed operations, all equipment was assumed to operate during the daytime and morning shoulder periods, all equipment excluding the crushers, screens and associated stackers was assumed to operate during the evening period and all equipment excluding crushers, screens, associated stackers and trucks running to landfill was assumed to operate during the night-time period.

Findings of the assessment are summarised below:

- Operational noise levels were assessed for the daytime, evening, night-time and morning shoulder periods during calm and prevailing weather conditions. The assessment found that operating noise from the site during both existing and proposed operations satisfies relevant INP PSNLs for all periods at all assessment locations.
- The potential for sleep disturbance from the modification during the night-time period has been assessed. The highest predicted external maximum noise level from site is L_{Amax} 53 dB in Minchinbury and L_{Amax} 44 dB in Erskine Park which is below the noise levels likely to cause sleep disturbance affects. Hence, it is unlikely that night-time operations from the project will cause sleep disturbance at the residential assessment locations.
- Road traffic generated by the proposal travels directly between the site and the arterial road network via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive. There are no residential assessment locations located along nearby roads and, therefore, the potential for the road traffic noise or relative increase criteria to be exceeded is highly unlikely.
- A review of cumulative industrial noise from the Facility together with other industrial noise sources in the vicinity was also conducted. The Facility is not predicted to increase industrial noise levels above the relevant amenity criteria.
- It is recommended that the site's noise limits be increased, in line with the highest predicted noise levels or Project Specific Noise Levels adopted for this assessment.

References

Australian Standard AS 1055-1997, *Acoustics - Description and Measurement of Environmental Noise – Parts 1, 2 and 3*.

Heggies Australia 2006, Noise Assessment – Concept Plan for the redevelopment of Lot 11 DP558723, Lot 1 DP200697 and Lot 2 DP262213.

NSW Department of Environment, Climate Change and Water (DECCW) 2011, *Road Noise Policy*.

NSW Environmental Protection Authority (EPA) 2000, *Industrial Noise Policy*.

NSW Environmental Protection Authority (EPA) 2013, *Industrial Noise Policy Application Notes*.

Blacktown City Council 2005, *State Environmental Planning Policy (SEPP) 59 – Eastern Creek Precinct Plan (Stage 3)*

Appendix A

On-site plant and equipment locations



Appendix B

Eastern Creek Precinct Plan Stage 3 - Noise limits

7.8 Noise and Vibration

Given the nature of development within the Precinct, noise generation from the site is to be restricted to a reasonable level. Noise is to be contained where possible and not unreasonably impact on the operations or amenity of adjoining or surrounding sites.

Objectives

Ensure that development does not cause adverse environmental impacts from noise and vibration.

Controls

- (a) Development Applications should provide an assessment, and identify necessary mitigation measures, to minimise the potential environmental impacts from noise and vibration generated by the proposed development.
- (b) Development Applications must comply with relevant Council, and government authority guidelines, to ensure no adverse environmental impacts occur both during and after development of the Precinct.
- (c) Where appropriate, development may need to be treated to minimise the impact from noise generated both on and off site.
- (d) Consideration shall be given to:
 - (i) the appropriate spatial arrangement of sensitive land uses;
 - (ii) the sensitive location of buildings on lots; and
 - (iii) the design of buildings to attenuate noise inside the building.
- (e) The optimised noise level goals for the Precinct are outlined in Table 1. These goals will provide adequate protection to the noise amenity of residential areas surrounding the Precinct without unduly restricting the operation of development.

Period	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Day	57 dBA	54 dBA	56 dBA	54 dBA	49 dBA	52 dBA
Evening	47 dBA	44 dBA	46 dBA	44 dBA	39 dBA	42 dBA
Night	42 dBA	40 dBA	40dBA	39 dBA	34 dBA	37 dBA

Table 1 – Optimum Noise Level Goals

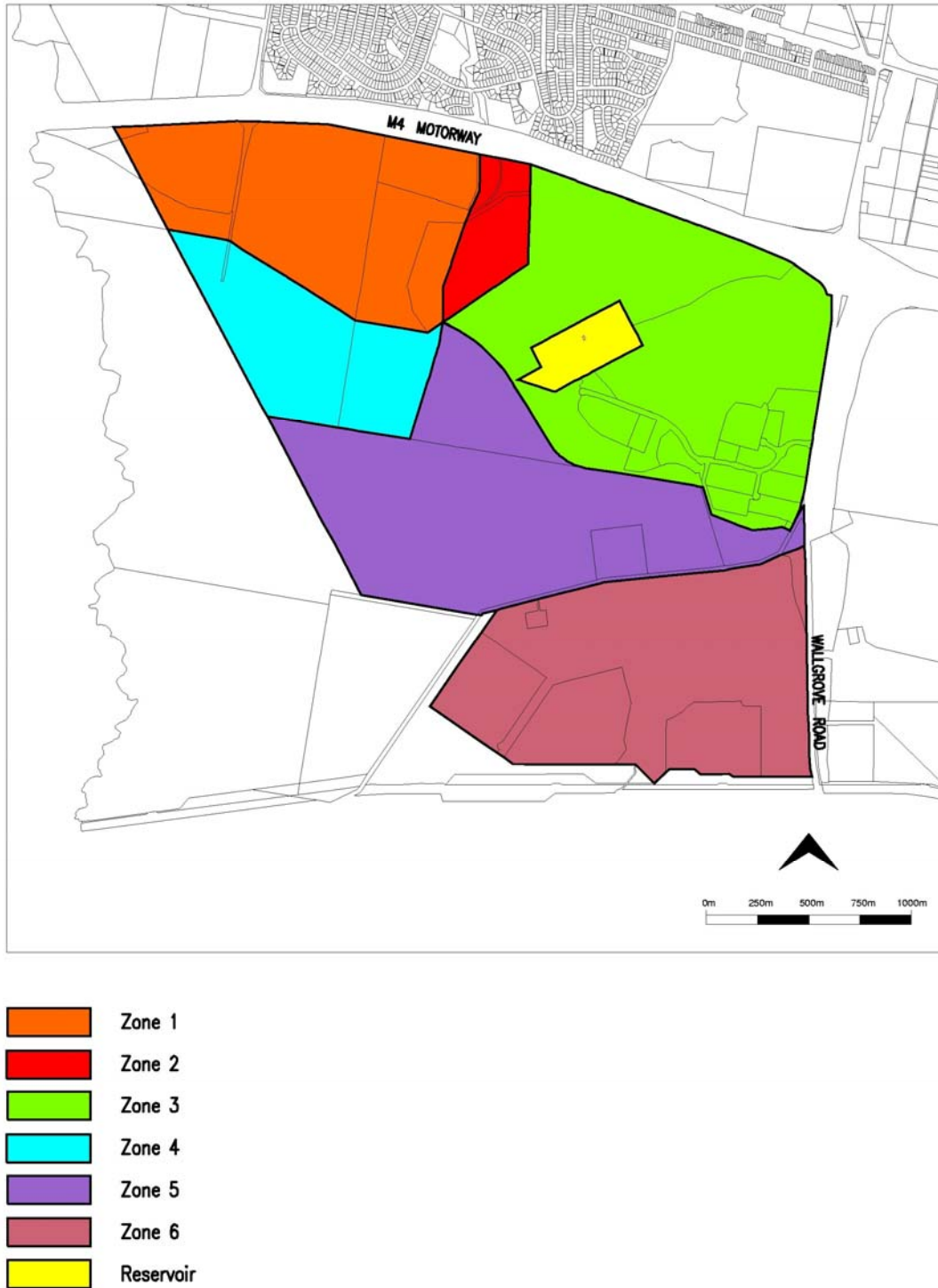


Figure 14 - Noise Emission Zones



E.2 Air Quality Impact Assessment Report

Intended for

Dial-a-Dump Industries
C/- EMM Consulting

Document type

Report

Date

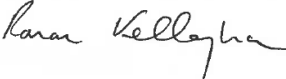
August 2018

Project No.

318000225

AIR QUALITY IMPACT ASSESSMENT GENESIS XERO WASTE FACILITY MODIFICATION 6

AIR QUALITY IMPACT ASSESSMENT
GENESIS XERO WASTE FACILITY MODIFICATION 6

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EXECUTIVE SUMMARY

Introduction

An air quality impact assessment has been prepared for a modification to the Genesis Zero Waste Facility at Eastern Creek (the Facility), which is owned and operated by Dial a Dump Industries Pty Limited (the proponent). The modification seeks to alter the hours of operation and increase the annual landfill cap limit of 700,000 tonnes to 1,000,000 tonnes (whilst not increasing the overall tonnes that may be accepted at the Facility).

Study approach

Local air quality impacts from the modification are assessed using a Level 2 assessment approach in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2016). Emissions are estimated for all activities and dispersion modelling is used to predict ground level concentrations at surrounding receptors. Cumulative impacts are assessed by combining the contribution from the modification with the existing ambient baseline.

Existing environment

Baseline meteorology is described with reference to the closest Bureau of Meteorology (BoM) automatic weather stations (AWS) and NSW Office of Environment and Heritage (OEH) monitoring sites. Surface observations from regional monitoring sites are included in the meteorological modelling using CALMET. Baseline air quality is described with reference to OEH monitoring sites at Prospect and St Marys and a monitoring site operated by the facility in the suburb of Minchinbury. Annual mean PM₁₀ concentrations across the three sites are 61% to 76% of the impact assessment criteria, while annual mean PM_{2.5} concentrations for the region are 98%-108% of the impact assessment criteria (i.e. already at or above the impact assessment). Elevated concentrations of PM_{2.5} for the Western Sydney region are strongly influenced by vehicle emissions (cars, trucks and off-road equipment) and from wood heaters during winter months. Exceedances of the 24-hour average criteria occur on occasion in Western Sydney, typically associated with periods of bushfire, hazard reduction and/or dust storms (NSW EPA, 2016).

Emissions

Modification 6 seeks to increase the landfill limit from 700,000 tpa to 1,000,000 tpa, to improve the operational flexibility to respond to market demand. A worst-case emissions assessment is considered based on a 50/50 split between the MPC and landfill. Modelling a scenario with 1,000,000 tpa hauled to landfill provides a conservative worst-case assessment of impacts, as hauling along the unsealed access road to the pit is the largest potential source.

Emissions inventories were developed for Total suspended particulate matter (TSP), PM₁₀ and PM_{2.5}. A conservative worst-case odour emission scenario was modelled, for landfilling at 1 Mpta plus greenwaste processing and composting at the MPC.

Results and conclusion

The predicted cumulative annual average PM₁₀ concentrations comply with the impact assessment criterion at all receptor locations. With the addition of existing background, there are no additional exceedances of the 24-hour average PM₁₀ impact assessment criterion at any receptor location.

The cumulative annual average PM_{2.5} concentrations exceed the impact assessment criterion at all locations, however this is because the annual average background concentrations of PM_{2.5} already exceed.

The cumulative 24-hour average PM_{2.5} concentrations result in additional exceedances of the impact assessment criterion at residential and commercial receptor locations. This is caused by a combination of elevated background with the additional dust emissions from the modification. It is noted that the background PM_{2.5} concentration on this day is already close to the impact assessment criterion (24.4 µg/m³). Additional statistical analysis shows that the probability or risk of any

additional exceedances of the 24-hour PM_{2.5} impact assessment criterion does not increase significantly, above what is already caused by background (i.e. up to one additional day as a worst case).

Cumulative annual average TSP concentrations comply with the impact assessment criterion at all receptor locations. Similarly, predicted dust deposition levels comply with both the incremental and cumulative impact assessment criteria at all receptor locations.

The worst case potential odour impact from landfilling at 1 Mtpa combined with greenwaste processing and composting, would not result in exceedances of the odour goal of 2 OU at any residential receptor.

To better monitor the effectiveness of existing controls and ongoing performance of the site, the proponent will consider relocating the PM₁₀ monitoring site in Minchinbury to a boundary location at the northern and/or eastern site boundary.

It is noted that the modelling scenarios presented in this report are unlikely from an operational point of view; as the Facility will continue to recycle as much waste as possible with limited amounts transferred to landfill.

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1. INTRODUCTION

Dial A Dump Industries Pty Limited (the proponent) operates the Genesis Zero Waste Facility (the Facility) at Eastern Creek in the Blacktown Local Government Area (LGA) (**Figure A1-1**). The facility is at 1 Kangaroo Avenue and comprises a Materials Processing Centre (MPC) and a general solid waste (non-putrescible) landfill (**Figure A1-2**).

The original project approval for the site was granted by the Minister for Planning in 2009 (MP 06_0139) under Section 75J of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). The operations commenced in 2012 and the project approval has been modified five times, most recently in March 2016.

The Facility is approved to accept up to 2 million tonnes per annum (Mtpa) of construction, demolition, commercial and industrial waste. The majority of the waste is directed to the MPC for sorting, processing and resale as products suitable for application to land such as road base. Material which is not suitable for recycling is disposed in the landfill, which is approved to accept up to 700,000 tonnes per annum (tpa) of rejects from the and waste received from offsite.

The proponent proposes to modify the project approval to alter the hours of operation and increase the landfill limit from 700,000 tonnes per annum to 1,000,000 tonnes per annum (excluding waste generated by recycling processes within the MPC).

This will enable the facility to have flexibility to accept the waste streams that will likely be generated during planned major construction projects in Sydney, some of which will be generated outside standard construction hours.

Ramboll has been commissioned to prepare an air quality impact assessment (AQIA) to support the environmental assessment (EA) prepared by EMM Consulting Pty Limited (EMM) for the modification.

1.1 Overview of Modification 6

1.1.1 Operating hours

The construction and operating hours are proposed to be changed to meet the demand of large infrastructure 24-hour construction projects such as motorways and commercial/residential development and to enable maintenance and cleaning outside of standard hours. The approved construction and operating hours from the project approval (Table 5 of Condition 39) are in **Table 1-1**.

Table 1-1: Approved hours

Activity	Days	Hours
Construction	Monday-Friday	7am-6pm
	Saturday	8am-4pm
	Sunday and public holidays	Nil
Operations (waste deliveries and use of chute)	Monday-Friday	7am-6pm
	Saturday, Sunday and public holidays	8am-4pm
Operations (MPC)	Monday-Friday	6am-10pm
	Saturday, Sunday and public holidays	6am-4pm

The proposed revised operating hours are in **Table 1-2**, which is proposed to replace Table 5 of Condition 39.

Table 1-2: Proposed hours

Activity	Sub-activity	Days	Hours
Construction		Monday-Friday	6am-6pm
		Saturday	8am-4pm
		Sunday and public holidays	Nil
Operations (waste deliveries, processing and landfilling)			
MPC and PSE	Receive materials	Monday-Sunday	24 hours
	Operations	Monday-Sunday	24 hours
SMA	Receive materials	Monday-Sunday	24 hours
	Crushing and screening	Monday-Sunday	6am-6pm
Landfill	Receive materials by truck	Monday-Sunday ¹	5am-9pm
	Convey waste from MPC to landfill via chute	Monday-Sunday	24 hours
Maintenance			
MPC, PSE and landfill	Repair machinery	Monday-Sunday	24 hours
SMA	Cleaning and machinery repairs	Monday-Sunday	24 hours
Chute	Clearing of blockages and general repairs	Monday-Sunday	24 hours

1.1.2 Landfill limit

The 700,000 tpa limit on landfilling is proposed to be increased to 1,000,000 tpa (excluding waste generated by recycling processes within the MPC and the Pre-Sort Building (PSB), which are the two stages of sorting materials in the co-mingled waste recycling stream). This will enable the Facility to provide waste disposal services for Sydney's current and proposed major construction projects including those in Western Sydney, which are likely to contain large volumes of material which cannot be recycled such as asbestos containing material.

1.2 Study objectives and requirements

The AQIA has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs), issued by NSW Department of Planning and Environment (DP&E) on 3 April 2017, as well as specific requirements provided by the NSW Environment Protection Authority (EPA) and Blacktown Council.

Table 1-3 provides a summary of the SEARs and agency comments relevant to this study and where the requirement has been addressed in this report.

Table 1-3: Summary of SEARs for air quality

Requirement	How requirement is addressed
SEARs	
<i>Air Quality – including an assessment of the impacts of air emissions on all surrounding receivers, including dust, odour and other potential pollutants.</i>	Report prepared in accordance with the Approved Methods (refer Section 2).
NSW EPA's requirement	
<i>Impacts of air emissions on all receivers, including odour from the Premises must be assessed.</i>	Report prepared in accordance with the Approved Methods (refer Section 2).
<i>The EPA is concerned that the proposal to increase operating hours and removal of the landfill cap of 700,000 tonnes per annum will dramatically increase the volume of waste material entering the Premises, and as a result will potentially be generating an increase of pollutants discharged to air. The Proponent must demonstrate effective control of dust, odour and other potential pollutants from the Premises in particular how it will be managed during the increased hours of operation.</i>	It is noted that the modification seeks to increase the landfill limit from 700,000 tpa to 1,000,000 tpa. A worse case modelling scenario is assessed based on 1 Mtpa being processed through the MPC and 1 Mtpa directed to landfill.
<i>In addition the preliminary proposal states odour is never an issue during MPC operations. There have been odour complaints relating to the Premises from the public. The complaints register on the Proponents website also confirms this. The Proponent must consider odour from the MPC and the Landfill and all potential pollutants which may be generated. The Proponent must prepare an assessment of the impacts of odour from the Premises, in particular from the landfill. The assessment must consider the impact that the increased operational activities within the landfill will have on odour as it must be considered that it would be possible for the proponent to landfill up to 2 million tonnes of waste per year.</i>	It is noted that the modification seeks to increase the landfill limit from 700,000 tpa to 1,000,000 tpa. Worst case potential odour emissions and impacts are discussed and presented in Section 6.2 and Section 7.4
Blacktown Councils response	
<i>Potential odour impacts of the 24/7 operation including machinery emissions and greenwaste activities (given the stockpiling of green waste is approved in this application. Should greenwaste no longer form part of this project, it should be deleted from the application).</i>	Odour from 24/7 operations, including greenwaste processing is addressed in Section 6.2 and 7.4

2. STUDY APPROACH

2.1 Assessment approach

The approach to the assessment follows guidelines recommended in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* ("the Approved Methods") (NSW EPA, 2016). Local air quality impacts are assessed using a Level 2 assessment approach (i.e. refined dispersion modelling technique using site-representative input data). The assessment approach is summarised as follows:

- Key pollutant indicators are identified, in this case dust and odour.
- Emissions are estimated for all dust generating activities associated with the facility.
- Dispersion modelling is undertaken using a regulatory dispersion model to predict ground level concentrations (GLCs) for key pollutants at nearby sensitive receptors.
- Cumulative impacts are assessed by taking into account the combined effect of facility with existing baseline air quality and/or other local sources of emissions.

2.2 Assessment scenarios

Modification 6 seeks to increase the landfill limit from 700,000 tpa to 1,000,000 tpa, to improve the operational flexibility to respond to market demand. For typical operations, 60%-80% of material enters the MPC and 20% to 40% of material is directed to landfill. A worst-case emissions assessment is considered based on a 50/50 split between the MPC and landfill. Modelling a scenario with 1,000,000 tpa hauled to landfill provides a conservative worst-case assessment of impacts, as hauling along the unsealed access road to the pit is the largest potential source.

2.3 Pollutant indicators

The key pollutants of concern during the operation of the Genesis facility are:

- Fugitive dust / particulate matter (PM), generated from waste receipt, handling, processing and product dispatch.
- Odour from greenwaste processing, landfilling and leachate management.

The combustion of diesel in trucks and other equipment would result in combustion-related emissions including PM, oxides of nitrogen (NO_x), sulfur dioxide (SO₂), carbon dioxide (CO₂), carbon monoxide (CO) and volatile organic compounds (VOCs).

Combustion derived PM has been included as part of the overall site emissions, as for PM_{2.5}, in particular, it can be a relatively important component of total site emissions. Other combustion derived emissions however have not been quantitatively assessed, as they would not result in significant off-site concentrations.

The air quality indicators that have been considered in this report are summarised in **Table 2-1**.

Table 2-1: Air quality indicators for assessment

Emission source	Air quality indicator
Waste handling, processing and product dispatch	Particulate matter (TSP ¹ , PM ₁₀ ² and PM _{2.5} ³)
	Nuisance dust (dust deposition)
Diesel fuel combustion	PM ₁₀ and PM _{2.5}
Greenwaste processing, landfilling and leachate management	Odour
Note: ¹ Total Suspended Particulate matter ² Particulate matter less than 10 microns in aerodynamic diameter ³ Particulate matter less than 2.5 microns in aerodynamic diameter	

2.4 Assessment criteria

2.4.1 Particulate matter

When first regulated, airborne PM was assessed based on concentrations of "total suspended particulate matter" (TSP). In practice, this typically referred to PM smaller than about 30-50 micrometres (μm) in diameter. As air sampling technology improved and the importance of particle size and chemical composition become more apparent, ambient air quality standards have been revised to focus on the smaller particle sizes, thought to be most dangerous to human health. Contemporary air quality assessment typically focuses on "fine" and "coarse" inhalable PM, based on health-based ambient air quality standards set for PM_{10} and $\text{PM}_{2.5}$.

Air quality criteria for PM in Australia are given for particle size metrics including TSP, PM_{10} and $\text{PM}_{2.5}$. The 2016 update to the 'Approved Methods', gazetted on 20 January 2017, includes particle assessment criteria that are consistent with revised National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) national reporting standards (National Environment Protection Council [NEPC], 1998; NEPC, 2015).

For the purpose of this report, predicted ground level concentrations (GLCs) are assessed against the NSW EPA's impact assessment criteria presented in **Table 2-2**.

Table 2-2: Impact assessment criteria for PM

PM metric	Averaging period	Concentration ($\mu\text{g}/\text{m}^3$)
TSP	Annual	90
PM_{10}	24 hour	50
	Annual	25
$\text{PM}_{2.5}$	24 hour	25
	Annual	8

Note: $\mu\text{g}/\text{m}^3$ = micrograms per cubic metre.

The Approved Methods specifies that the impact assessment criteria for 'criteria pollutants'¹ are applied at the nearest existing or likely future off-site sensitive receptor and compared against the 100th percentile (i.e. the highest) dispersion modelling prediction. Both the incremental and cumulative impacts need to be considered (consideration of existing ambient background concentration is required).

The Approved Methods also prescribes nuisance based goals for dust deposition, which relate to amenity type impacts such as soiling of exposed surfaces. The NSW EPA impact assessment criteria for dust deposition are summarised in **Table 2-3**, illustrating the maximum increase and total dust deposition rates which would be acceptable so that dust nuisance can be avoided.

Table 2-3: Dust deposition criteria

Pollutant	Maximum Increase in Dust Deposition	Maximum Total Dust Deposition Level
Deposited dust (assessed as insoluble solids)	2 $\text{g}/\text{m}^2/\text{month}$	4 $\text{g}/\text{m}^2/\text{month}$

Note: g/m^2 = grams per square metre.

¹ 'Criteria pollutants' is used to describe air pollutants that are commonly regulated and typically used as indicators for air quality. In the Approved Methods, the criteria pollutants are TSP, PM_{10} , nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), deposited dust, hydrogen fluoride and lead.

2.4.2 Odour

Dynamic olfactometry is the accepted method of odour measurement and involves a sample of odorous air being presented to a panel of people with decreasing quantities of clean odour-free air. The panellists note when the smell becomes detectable and the correlation between the known dilution ratios and the panellists' responses are used to calculate the number of dilutions required to achieve the odour detection threshold. The units for odour measurement are "odour units" (ou), which, according to the method described above, are effectively "dilutions to threshold".

The odour nuisance level can be as low as 2 ou and as high as 10 ou (for less offensive odours), whereas an odour assessment criterion of 7 ou is likely to represent the level below which 'offensive' odours should not occur. The NSW EPA's *Technical framework - Assessment and management of odour from stationary sources in NSW* (NSW EPA, 2006a) recommends that, as a design criterion, no individual should be exposed to ambient odour levels of greater than 7 ou.

The Approved Methods prescribes odour goals which take into account the population density for a particular area. The most stringent odour goal of 2 ou is acceptable for the whole population and therefore appropriate for urban areas (NSW EPA, 2016).

The 2 ou odour goal should be compared against the 99th percentile of the dispersion modelling predictions. The 1-hour average dispersion modelling prediction is converted to a peak (i.e. 1-second 'nose response average') based on a peak to mean ratio of 2.3, in accordance with the Approved Methods.

2.5 Overview of modelling approach

The modelling for this assessment uses a combination of TAPM and CALMET/CALPUFF, as follows:

- TAPM is used to generate gridded three-dimensional upper air data for each hour of the model run period for input into CALMET.
- CALMET, the meteorological pre-processor for the dispersion model CALPUFF, calculates fine resolution three-dimensional meteorological data using a combination of surface observations and the prognostic TAPM upper air data.
- CALPUFF then calculates the dispersion of plumes within this three-dimensional meteorological field.

2.6 Cumulative impacts

Cumulative impacts are assessed by combining the contribution from the Facility with the existing ambient air quality environment, described based on baseline monitoring data for the region (refer to **Section 5**). The derived baseline is assumed to account for all existing emissions sources in the local airshed.

3. LOCAL SETTING AND ASSESSMENT LOCATIONS

3.1 Location

The facility is on a site that comprises 52 hectares (ha) at the following lots (**Figure A1-2**):

- Lot 1 DP 1145808; and
- Lot 8 DP 1200048.

The site address is 1 Kangaroo Avenue. It is accessed from Kangaroo Avenue. The volume of the final quarry void was estimated to be 11 million m³.

3.2 Surrounding land use

The site is in an area being developed for commercial and industrial use under State Environmental Planning Policy (Western Sydney Employment Area) 2009. Adjacent landowners are:

- Australand, which owns and leases warehousing to the north-east;
- Hanson, which owns an asphalt batching plant to the south-east;
- NSW Department of Planning and Infrastructure, which owns vacant land to the south-west; and
- Sargents, which is developing land to the west.

The site is surrounded by Kangaroo Avenue to the east and north-east, the M4 Western Motorway to the north, Archbold Road to the west and the future Precinct Road to the south.

Further afield there is residential development in Minchinbury beyond the Western Motorway to the north and in Erskine Park beyond Archbold Road to the west, and predominantly undeveloped land containing high voltage powerlines to the west and south-west.

3.3 Sensitive receivers

The residential areas of Minchinbury are approximately 430 m north and of Erskine Park approximately 1,200 m west of the nearest site boundaries. The nearest commercial premises are adjacent to the northern boundary of the site. Locations representative of these sensitive receivers have been identified and selected as discrete sensitive receptors (refer to **Figure A5-1** in **Appendix 5**).

Nearby residences and industrial / commercial facilities not identified as discrete sensitive receptors can be assessed with reference to the contour plots presented in this report, which show predicted ground level concentrations of key pollutants across all areas in the vicinity of the facility.

4. OVERVIEW OF LOCAL AND REGIONAL METEOROLOGY

4.1 Introduction

Meteorological mechanisms govern the generation, dispersion, transformation and eventual removal of pollutants from the atmosphere. To adequately characterise the dispersion meteorology of a region, information is needed on the prevailing wind regime, ambient temperature, rainfall, relative humidity, mixing depth and atmospheric stability.

Analysis of meteorology for region is presented based on the closest Bureau of Meteorology (BoM) automatic weather station (AWS) and NSW Office of Environment and Heritage (OEH) monitoring sites, as follows:

- St Marys OEH site – located approximately 6 km west of the site.
- Horsley Park Equestrian Centre AWS– located approximately 6 km southeast of the site.
- Badgerys Creek AWS – located approximately 14 km southwest of the site.
- Penrith Lakes AWS – located approximately 16.5 km west of the site.
- Bankstown Airport AWS – located approximately 19 km southeast of the site.
- Holsworthy Control Range AWS – located approximately 21.5 km southeast of the site.
- Sydney Olympic Park AWS - located approximately 22 km southeast of the site.
- Richmond RAAF AWS - located approximately 23 km northwest of the site.
- Camden Airport AWS – located approximately 29 km southwest of the site.

These surface observation sites are included in the modelling (referred to as data assimilation) to provide real-world observations and improve the accuracy of the wind field. It is noted that the proponent operates an on-site weather station, however the station is used for operational dust control (i.e. to trigger water sprays) and the siting makes it unsuitable for the purposes of dispersion modelling. It is also noted that another OEH monitoring site at Prospect, located 8 km east of the site, has not been used for data assimilation. This site is compared to CALMET meteorology to review and evaluate the accuracy and representativeness of the predicted wind field (**Section 4.4**).

In the absence of upper air measurements, CALMET is run using prognostic upper air data (three-dimensional '3D.dat' file generated using TAPM), used to drive an 'initial guess' wind field. The model then incorporates mesoscale and local scale effects, including the surface observations, to adjust the final wind field. This modelling approach is known as the "hybrid" approach (TRC, 2011). TAPM and CALMET model settings are described in **Appendix 2**, selected in accordance with recommendations in the Approved Methods and in TRC (2011).

4.2 Selecting a representative year for modelling

To select a representative year for modelling, five years of monitoring data were reviewed from the sites closest to the Genesis facility (Horsley Park and St Marys). These sites are those most likely to influence CALMET modelling, based on the selected radius of influence (R1 and RMAX, as described in **Appendix 2**).

Annual wind roses for the period 2012 to 2016 for both Horsley Park and St Marys are presented in **Figure 4-1** and **Figure 4-2**. The wind roses demonstrate a high degree of consistency in winds across the five years, in terms of wind direction, average winds speed and percentage occurrence of calms conditions. Based on this review, the calendar year 2016 is selected as a suitable representative year for modelling.

Furthermore, ambient temperature recorded during 2016 is compared with long-term records at the BoM Prospect Reservoir long term monitoring station and shown to correlate well with the long-term trends. The minimum, maximum, mean and upper and lower quartile temperatures for each month of the modelling year (2016) are presented as a box and whisker plot shown in **Figure 4-3**, and show that the upper and lower quartile and mean temperatures fall within the long term mean monthly maximum and minimum temperatures.

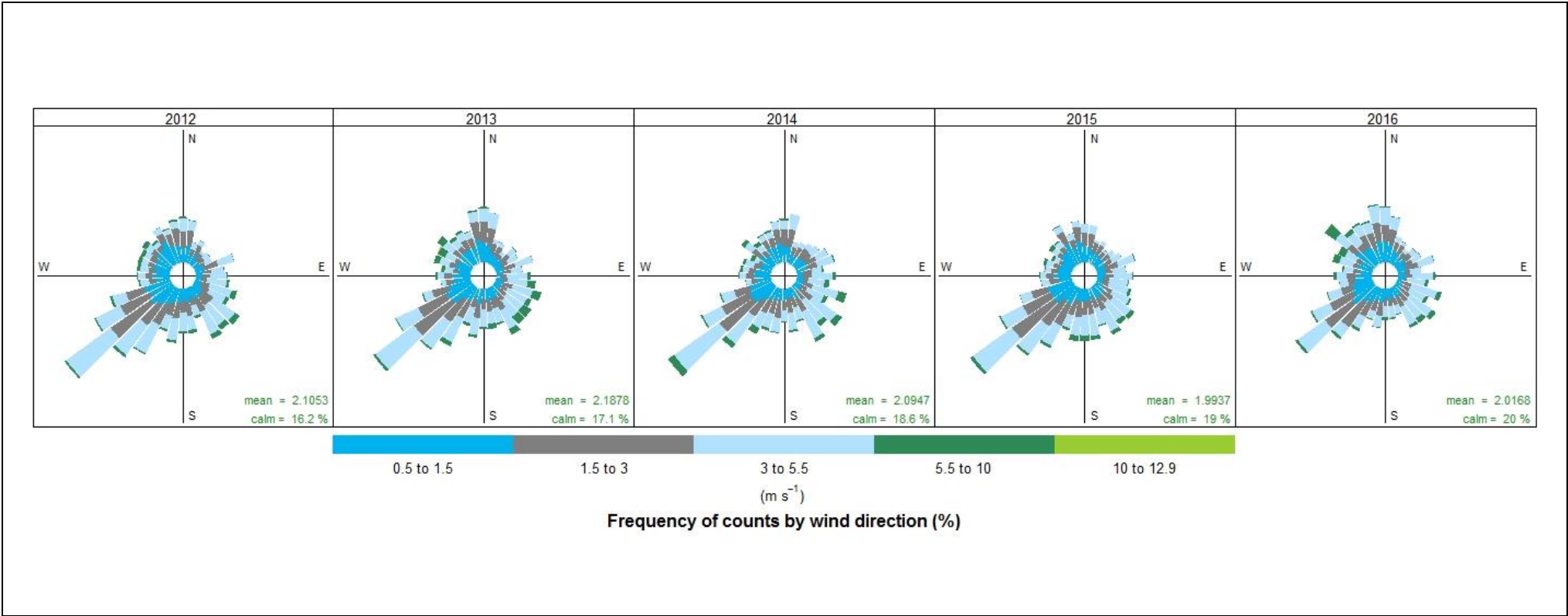


Figure 4-1: Annual wind rose for Horsley Park BoM site – 2012 - 2016

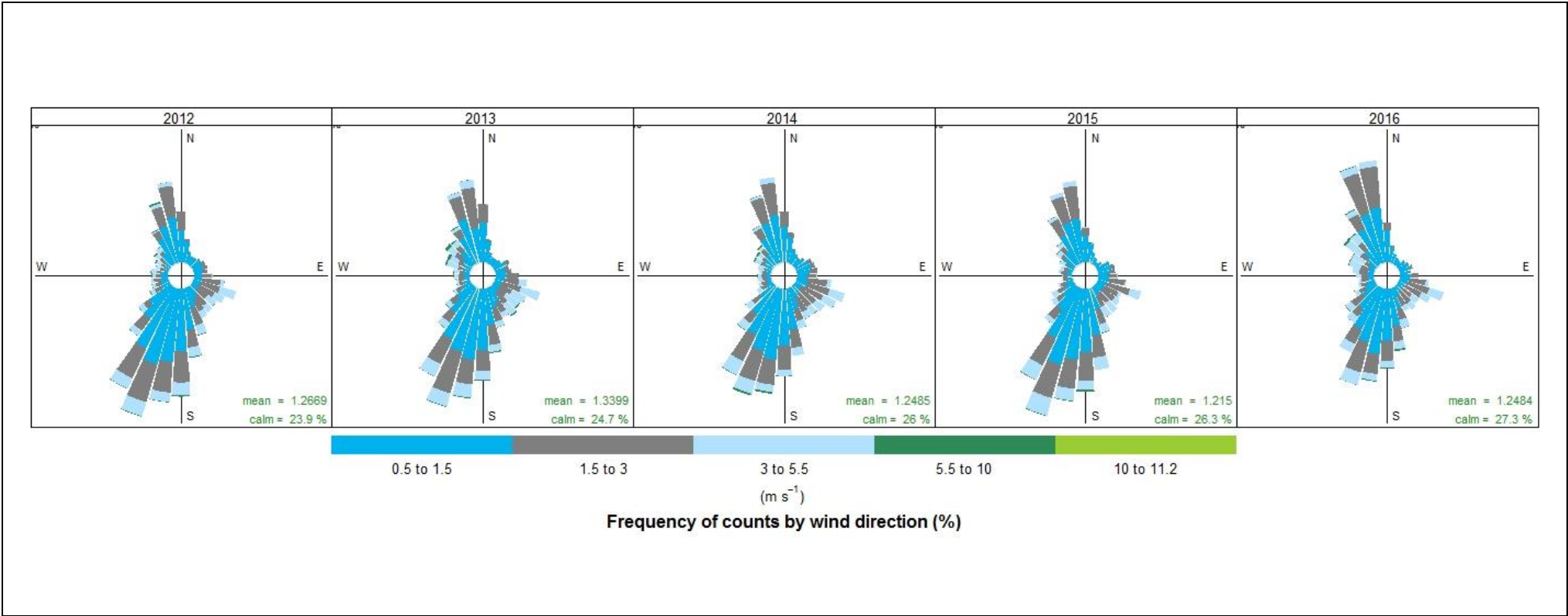


Figure 4-2: Annual wind rose for St Marys OEH site – 2012 - 2016

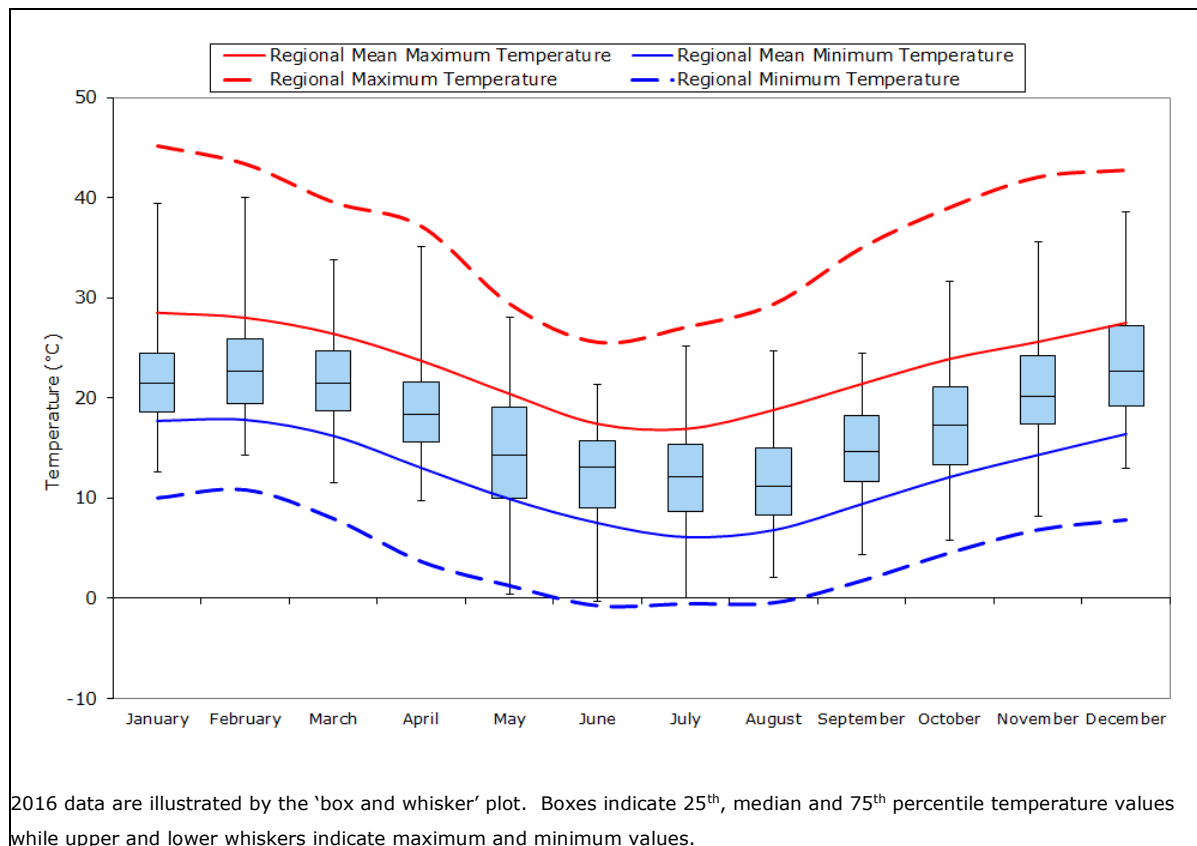


Figure 4-3: Comparison of long-term temperature records with modelling period

4.3 Prevailing winds for the region

The 2016 annual wind rose for each surface observation site is presented in **Figure 4-4**. The dominant prevailing wind pattern varies across the region. At some of the observations sites, it appears that local features influence the prevailing winds (for example Sydney Olympic Park and St Marys).

Across many of the sites there is a dominant southwest component to the annual wind rose, although winds from all directions are recorded for a small percentage of time. Average wind speeds range from 2 to 3 metres per second (m/s) while the percentage occurrence of calm winds (<0.5 m/s) ranges from low at Holsworthy (7%) to high St Marys (33%).

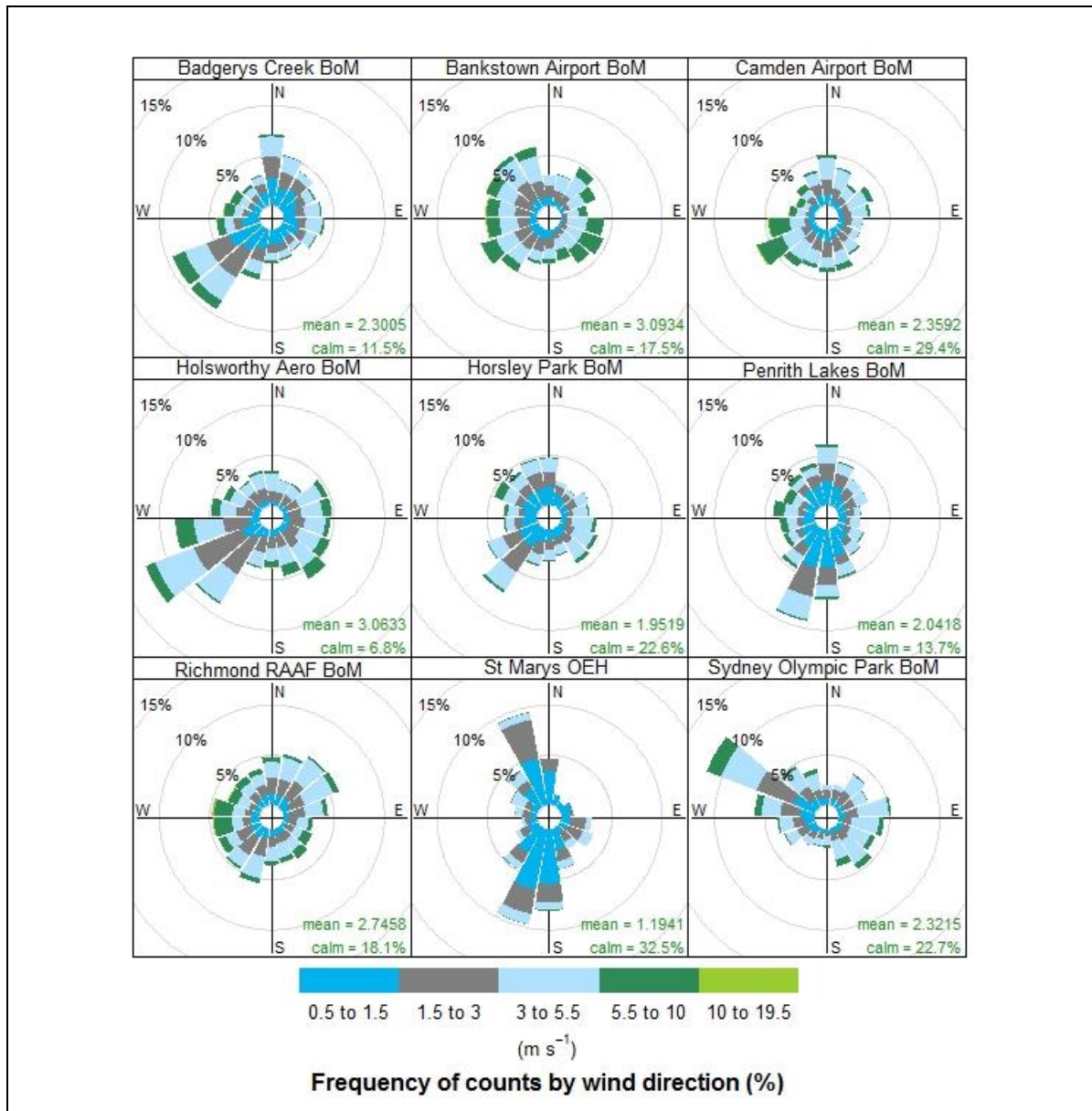


Figure 4-4: Annual wind roses for the region

4.4 Evaluation of CALMET predicted winds

CALMET is a non-steady state model which generates a temporal and spatial varying wind field across the modelling domain; therefore, no single wind rose is representative of the dispersion conditions used by the model. However, an evaluation of CALMET performance is presented in **Figure 4-5**, comparing predicted CALMET winds with observations at the Badgerys Creek BoM site.

To facilitate this comparison, the CALMET model was run without data assimilation for the Badgerys Creek BoM site. The wind rose presented in **Figure 4-5** shows comparable wind directions, wind speeds and percentage occurrence of calm winds between observed and predicted and based on this comparison, it is concluded the model predicts regional wind conditions with a suitable level of accuracy.

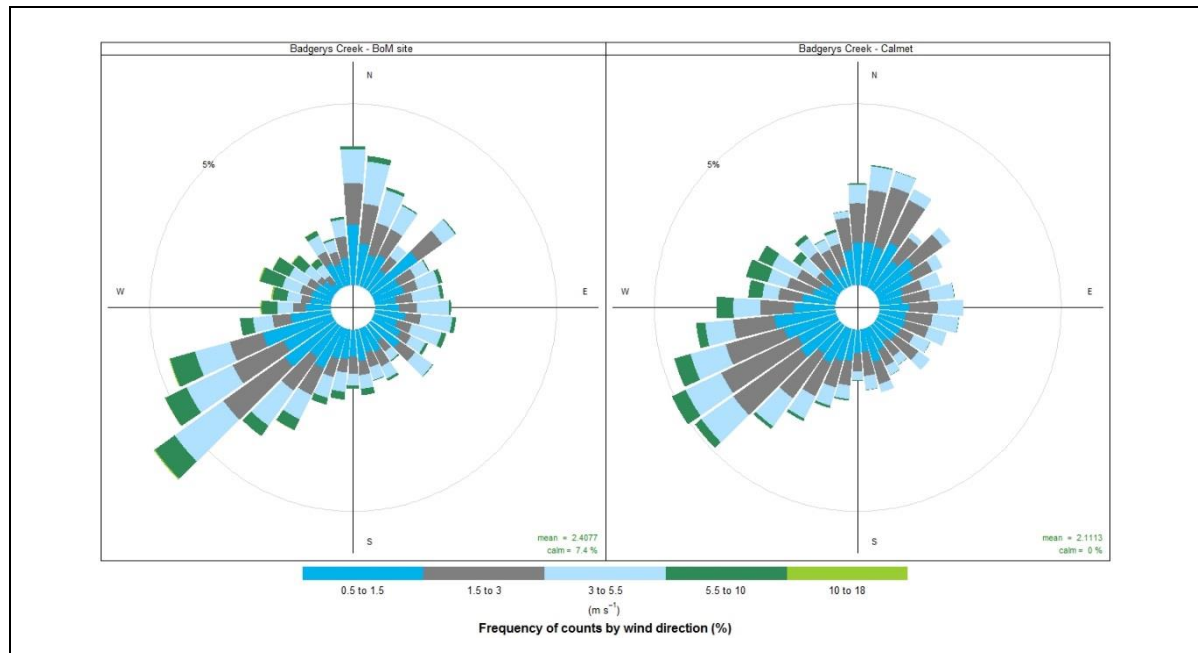


Figure 4-5: Comparisons of observed and CALMET predicted winds for the Badgerys Creek BoM site

A further comparison is presented in **Figure 4-6**, showing CALMET winds at the Genesis site (indicative of dispersion conditions in the immediate vicinity of the emission source) and observations at Prospect, approximately 8 km to the east. Prospect was not included as a data assimilation site for modelling.

The wind roses display similar patterns, with winds recorded from most directions and a slightly higher frequency of occurrence from the south west quadrant at both sites. Prospect records a slightly higher frequency of occurrence from the north and northwest quadrant, compared to CALMET. Annual average wind speeds are comparable (1.5 m/s and 1.8 m/s) while the percentage occurrence of calm winds is higher onsite (19%) compared to Prospect (10%). Based on this comparison, it is concluded that the CALMET derived wind field provides a suitable representation of local meteorology for the assessment. Seasonal and diurnal wind roses for CALMET at the Genesis site are shown in **Appendix 3**.

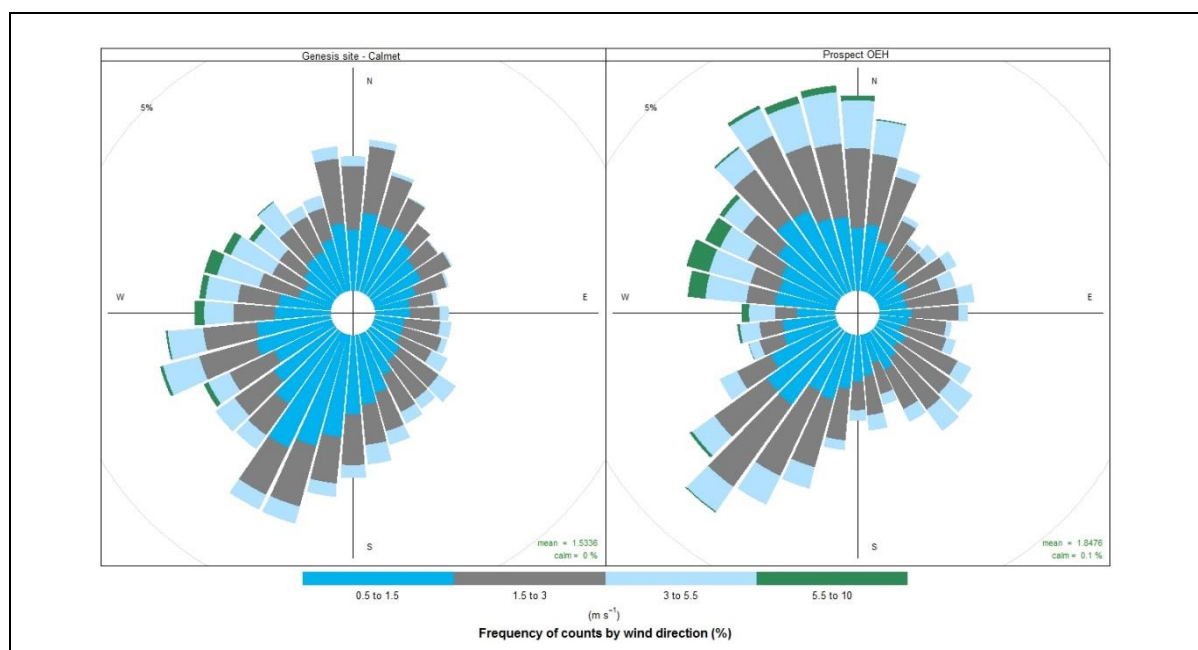


Figure 4-6: Comparisons of CALMET winds for the Genesis site with Prospect OEH

4.5 Atmospheric boundary layer heights

The atmospheric boundary layer constitutes the first few hundred metres of the atmosphere. This layer is directly affected by the earth's surface, either through the retardation of air flow due to the frictional drag of the earth's surface (mechanical mechanisms), or as result of the heat and moisture exchanges that take place at the surface (convective mixing) (Stull, 1997; Oke, 2003).

During the daytime, the atmospheric boundary layer is characterised by thermal turbulence due to the heating of the earth's surface and the extension of the mixing layer to the lowest elevated subsidence inversion. Due to radiative flux divergence, nights are typically characterised by weak to no vertical mixing and the predominance of stable conditions. These conditions are normally associated with low wind speeds and hence lower dilution potentials.

CALMET generated mixing heights are extracted at site and the average boundary layer heights by hour of the day is shown in **Figure 4-7**. As seen in median and upper and lower quartiles, the highest boundary layer heights are experienced during the day time hours, peaking in the mid to late afternoon. Higher day-time wind velocities and the onset of incoming solar radiation increases the amount of mechanical and convective turbulence in the atmosphere. As turbulence increases so too does the depth of the boundary layer, generally contributing to higher mixing depths and greater potential for atmospheric dispersion of pollutants.

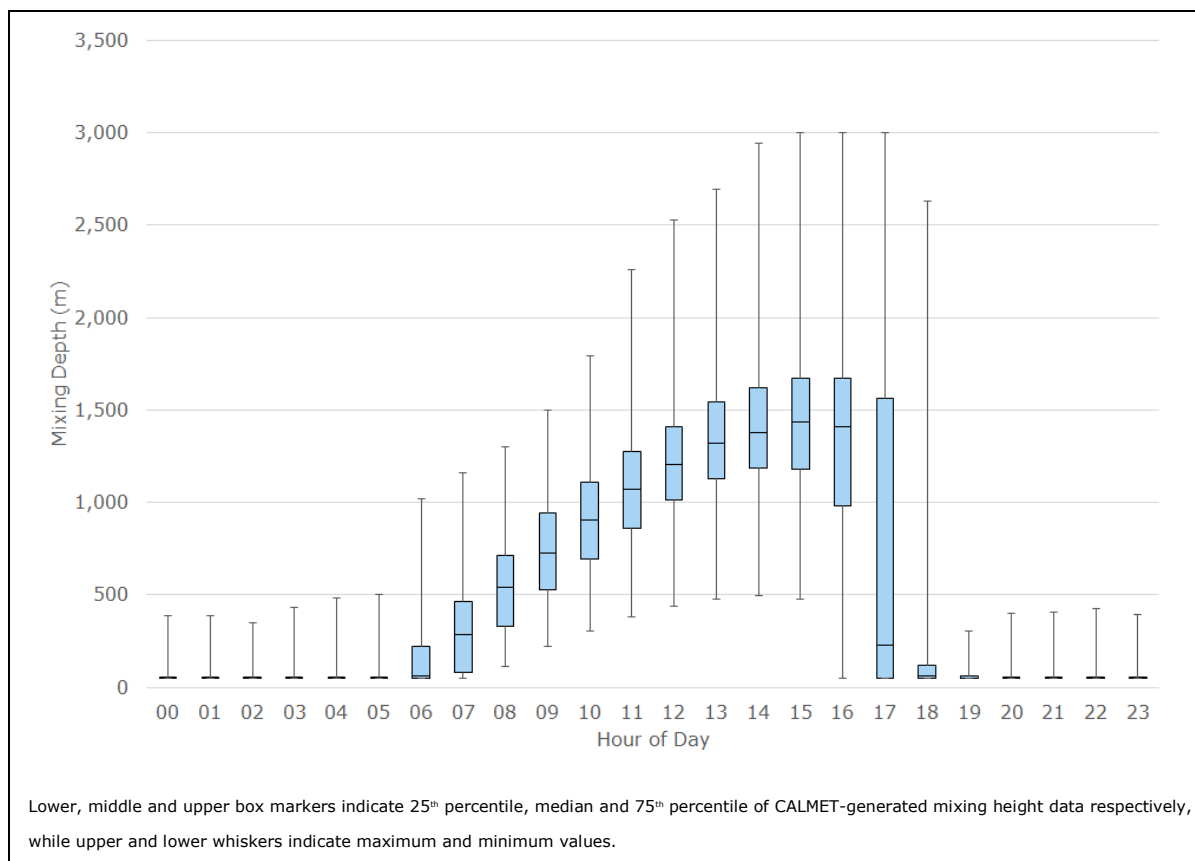


Figure 4-7: CALMET-generated diurnal variations in average boundary layer depth

4.6 Atmospheric stability

Atmospheric stability refers to the degree of turbulence or mixing that occurs on the atmosphere and is a controlling factor in the rate of atmospheric dispersion of pollutants. The Monin-Obukhov length (L) provides a measure of the stability of the surface layer (i.e. the layer above the ground in which vertical variation of heat and momentum flux is negligible - typically about 10% of the mixing height). Negative L values correspond to unstable atmospheric conditions, while positive L values correspond to stable atmospheric conditions. Very large positive or negative L values correspond to neutral atmospheric conditions.

Figure 4-8 illustrates the diurnal variation of atmospheric stability derived from the Monin-Obukhov length calculated by CALMET. The diurnal profile at all locations illustrates that atmospheric instability increases during daylight hours as convective energy increases, while stable atmospheric conditions prevail during the night-time. The potential for atmospheric dispersion of emissions is therefore greatest during day time hours and lowest during evening through to early morning hours.

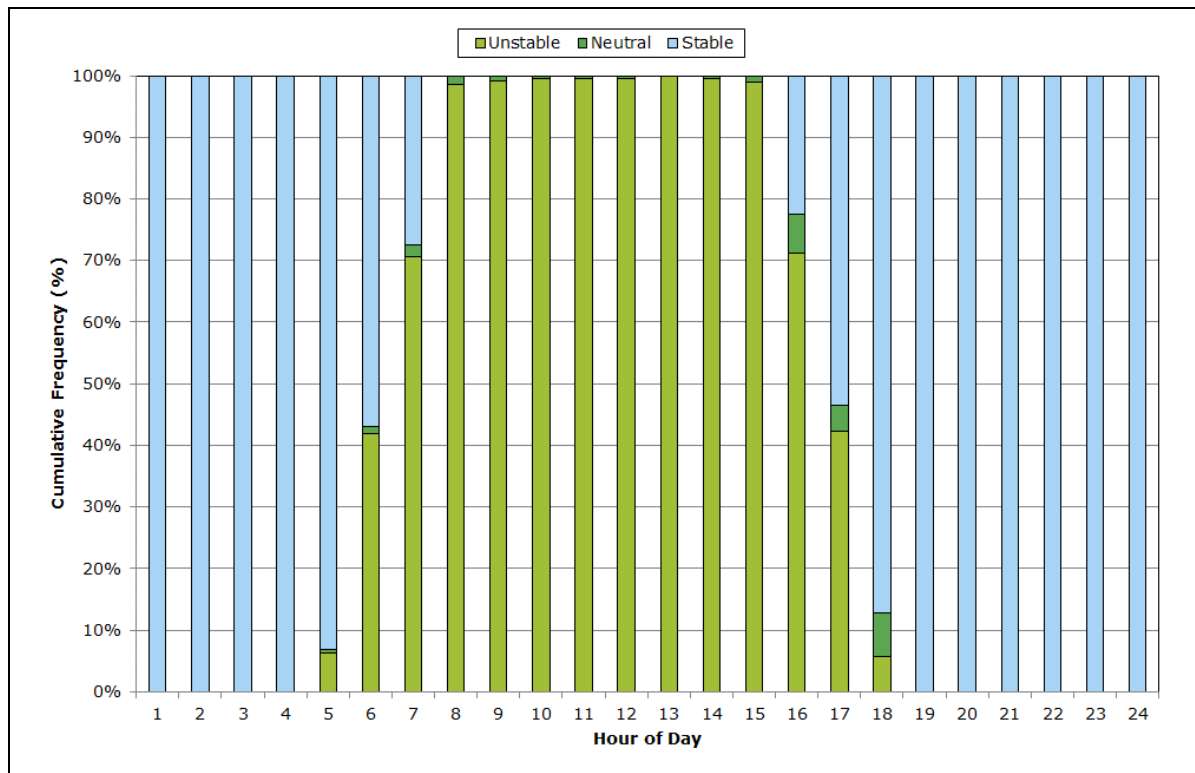


Figure 4-8: Diurnal variations in atmospheric stability derived from CALMET generated Monin-Obukhov length

5. EXISTING ENVIRONMENT

5.1 PM₁₀ and PM_{2.5}

The Facility operates a BAM PM₁₀ monitor at Minchinbury, which has been operational since mid-2012 and summary statistics for the modelling period (2016) are presented in **Table 5-1**. Reference is also made to the closest OEH sites at St Marys and Prospect (within 6 km of the site). Both OEH sites measure concentrations of PM₁₀ and PM_{2.5} (which is not measured by the Facility), although it is noted that PM_{2.5} was only added as a parameter at St Marys in March 2016.

Annual mean PM₁₀ concentrations across the three sites are 61% to 76% of the impact assessment criteria, while annual mean PM_{2.5} concentrations for the region are 98%-108% of the impact assessment criteria (i.e. already at or above the impact assessment criteria). Elevated concentrations of PM_{2.5} for the Western Sydney region are strongly influenced by vehicle emissions (cars, trucks and off-road equipment) and from wood heaters during winter months.

A timeseries plot of the 24-hour average concentrations in **Figure 5-1** shows the periods when the 24-hour average PM₁₀ concentration exceeds 50 µg/m³ and in **Figure 5-2** when the 24-hour average PM_{2.5} concentration exceeds 25 µg/m³. Exceedances of the 24-hour average criteria in Sydney are typically associated with periods of bushfire, hazard reduction and/or dust storms (NSW EPA, 2016).

Table 5-1: 2016 summary statistics (µg/m³) for PM₁₀ and PM_{2.5}

Metric	Statistic	Genesis	St Marys	Prospect
PM₁₀	Annual mean	15.3	16.1	18.9
	Daily maximum	125.0*	100.2	110.1
	95 th percentile	27.0	29.9	33.7
	90 th percentile	23.7	26.4	29.5
	Number of exceedances	2*	3	4
PM_{2.5}	Annual mean	-	7.8	8.7
	Daily maximum	-	93.2	84.9*
	95 th percentile	-	13.7	17.8
	90 th percentile	-	11.4	14.0
	Number of exceedances	-	5	5*

Note: * Not based on a full year of observations so not a true daily maximum or number of exceedances

5.2 TSP

TSP concentrations are not measured in the vicinity of the site, however historical measurements of TSP and PM₁₀ in Sydney² indicate that PM₁₀/TSP ratios in urban areas typically range from 0.4 to 0.5. These ratios can be applied to the PM₁₀ concentration data to derive an annual average TSP concentration.

5.3 Dust deposition

Dust deposition is measured at four locations on the site and results for the previous four years are summarised in **Table 5-2**. The measured dust deposition across all sites and years is 1.7 g/m²/month, which is consistent with background measurements seen across much of NSW (which is typically in the range of 1 g/m²/month to 2 g/m²/month).

²Reported in Quarterly Air Quality Monitoring Reports - <http://www.environment.nsw.gov.au/aqms/dataareports.htm#quarterlies>

Table 5-2: Annual average dust deposition

Site	2016	2015	2014	2013	Average
North DDG	1.1	2.9	1.9	1.3	1.6
East DDG	1.5	2.9	1.4	2.0	1.8
South DDG	1.6	1.6	1.9	1.8	1.7
West DDG	2.1	1.8	2.4	1.6	1.8
Average	1.2	1.6	2.3	1.9	1.7

5.4 Adopted background for cumulative assessment

The baseline air quality adopted for cumulative assessment is summarised in **Table 5-3**. Annual average concentrations are generally based on the highest of the mean concentrations presented in **Table 5-1** (i.e. the Prospect monitoring site), however gaps in the daily data have been filled using both St Marys and the Facility's datasets. In the case of PM_{2.5} (which isn't measured at the Facility and was only added at St Marys in March 2016) additional gaps in the daily data are estimated from the average PM₁₀/PM_{2.5} ratio from the available data.

As previously described, background concentrations of PM_{2.5} are already approaching or exceeding the impact assessment criteria and therefore assessment of impact will also be discussed in the context of the incremental increase from the proposal. For short term impacts, daily varying PM₁₀ and PM_{2.5} concentrations in 2016 are paired with modelling predictions for the same period.

Table 5-3: Adopted background for cumulative assessment

Pollutant	Averaging period	Adopted background value
PM ₁₀	24-hour average	Daily varying
	Annual average	18.9 µg/m ³
PM _{2.5}	24-hour average	Daily varying
	Annual average	8.6 µg/m ³
TSP	Annual average	47.2µg/m ³
Dust deposition	Annual average	2 g/m ² /month

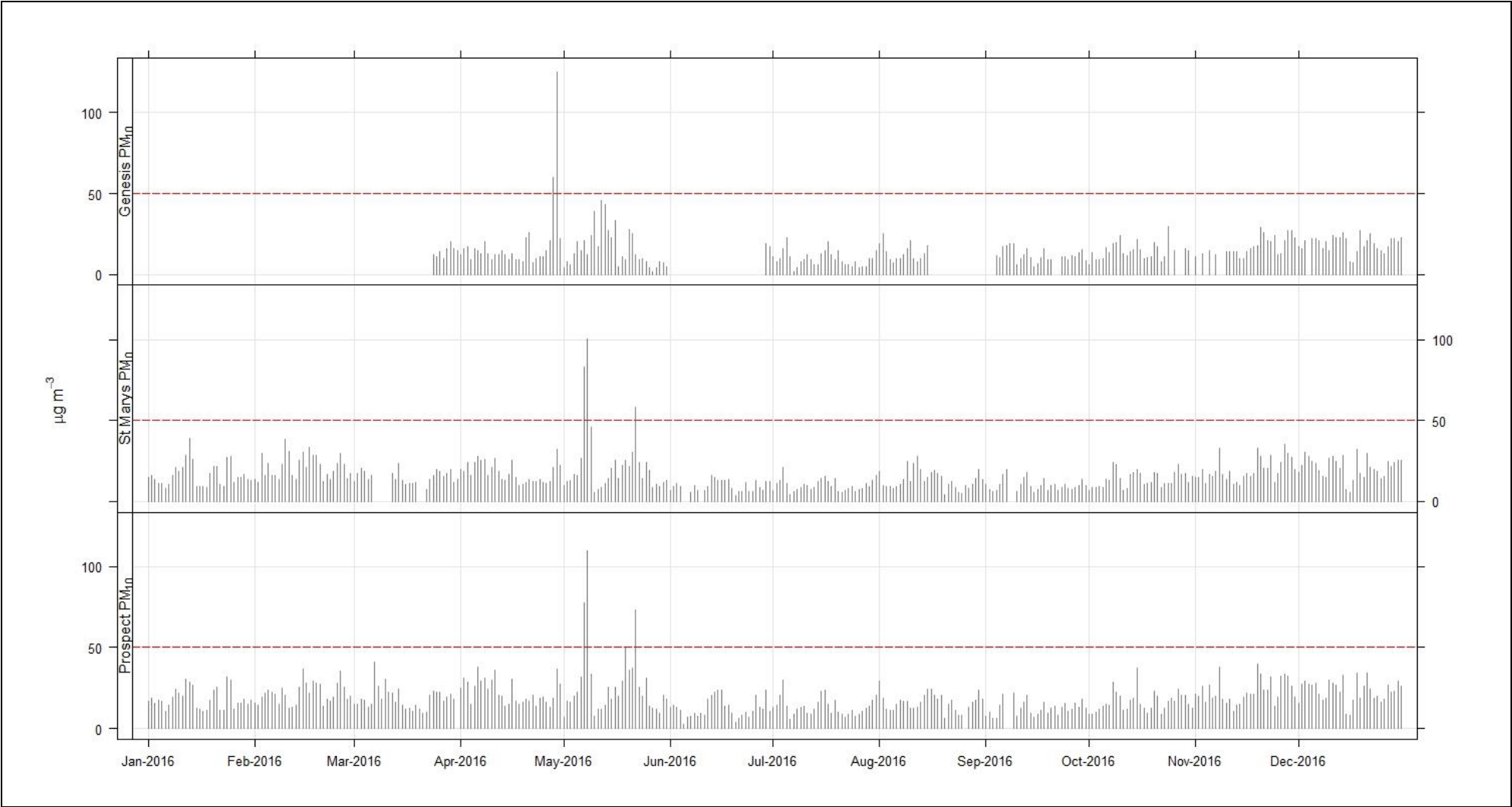


Figure 5-1: 24-hour average PM₁₀ concentrations

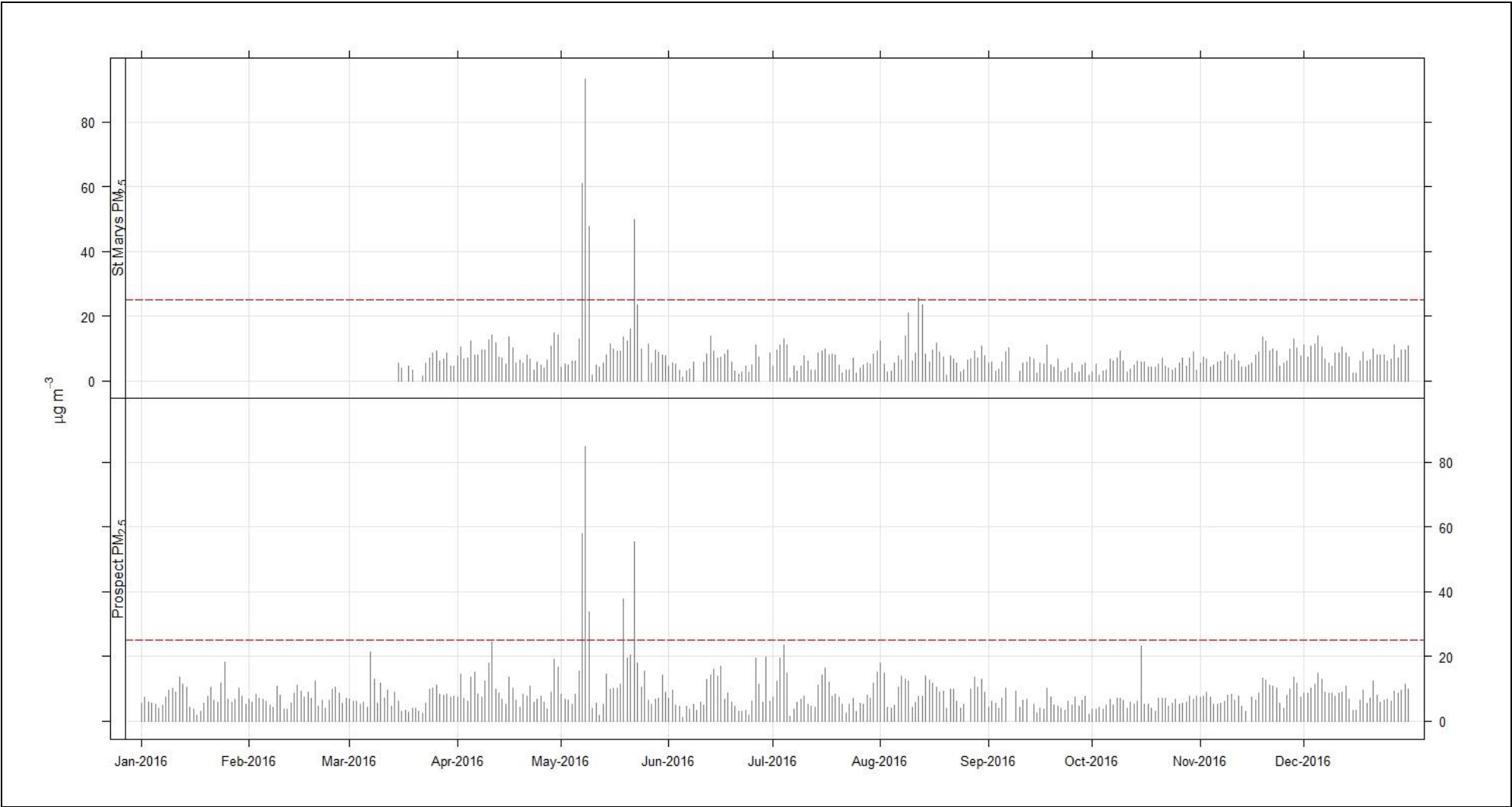


Figure 5-2: 24-hour average PM_{2.5} concentrations

6. EMISSION INVENTORY

6.1 Dust emissions

Emission factors developed by the US EPA³ have been applied to estimate the amount of dust produced by each activity (i.e. wheel generated dust, waste handling / processing and wind erosion). Emissions estimates have been developed for TSP, PM₁₀ and PM_{2.5}, with the emission estimates for TSP also used to estimate dust deposition rates.

The extent to which the US EPA emissions factors account for the diesel exhaust component of each activity varies according to the emission factor and/or monitoring method which was used in deriving the emission factor. For hauling on paved surfaces, the exhaust component is not included whereas for material processing/handling, the emission factors may include some of the diesel exhaust component. To be conservative for this assessment, we have assumed that all emission factors do not include the exhaust component and emissions from diesel combustion are included as a separate emissions source.

Emissions are estimated based on a 50/50 split between the MPC and the landfill; that is, of the 2 Mtpa entering site, 1 Mtpa is processed through the MPC and 1 Mtpa enters the landfill. A summary of the annual TSP, PM₁₀ and PM_{2.5} emissions are presented in **Table 6-1**.

Further details on the emission inventory development, including the assumptions, input data and emission factors used, is provided in **Appendix 4**.

6.1.1 Existing dust controls

A number of existing and proposed dust controls are accounted for in the emissions estimates, as follows:

- Enclosure of material handling and processing and storage within the MPC shed.
- Misting sprays operated within the shed to dampen material as it is sorted and before being loaded to the hopper.
- The majority of travel routes onsite are sealed (exceptions are the haul route into the pit and within the segregated materials area).
- Water sprays on the mobile crusher and shredder.
- Fixed water sprays on product storage areas.
- Water truck operating on unsealed haul road into the pit, within the landfill and on the paved roads as needed.
- Speed limit of 40km/hr for unsealed haul road into the pit.
- Water cannon operating within the pit.
- Established earth bund along the northern boundary of the pit.
- A fixed water spray system operates on the access roadway.

Some of the dust controls listed above are incorporated into the emissions inventory for each relevant activity, based on control efficiencies reported in the literature. For example, all activities occurring within the shed are assigned a control efficiency of 40%. This is based on reported control efficiencies for material handling/transfer from enclosure or wind shielding, which range from 40% to 70% depending on roof/side wall wind shielding or full enclosure on all sides (Katestone, 2011). To provide a conservative (upper bound) estimate of emissions, we have adopted the lower of these reported control efficiencies. Also, to account for the mist sprays within the shed a control efficiency of 70% is assumed for waste sorting and loading the hopper (combination of 50% for watering and 40% for wind shielding).

³US EPA AP-42 Compilation of Air Pollutant Emission Factors (US EPA, 1998b; US EPA, 2004; US EPA, 2006).

Table 6-1: Particulate matter emissions for Modification 6 (kg/annum)

Activity	Controlled emissions (kg/annum)		
	TSP	PM ₁₀	PM _{2.5}
Waste trucks entering site - site access to MPC (paved)	2,483	477	115
Trucks unloading	92	44	7
Ex/FEL sorting waste	92	44	7
FEL loading hopper	64	30	5
Screening in MPC	154	52	4
Transfer points	387	183	28
Unloading to product storage	172	81	12
Rehandle to product storage (loading trucks)	172	81	12
Rehandle to product storage (hauling)	1,303	250	61
Mobile crusher - concrete/brick for roadbase product	306	138	26
Mobile screening - sand/soil	187	63	4
Shredding greenwaste	48	22	4
Loading product stockpiles	291	138	21
Loading product trucks	291	138	21
Product trucks leaving site - MPC to site access (paved)	1,078	207	50
Chute unload to landfill	9	4	0.6
Wheel generated dust - weighbridge to landfill (unpaved)	12,569	3,393	339
Trucks unloading	25	12	2
Dozer pushing waste at landfill	4,084	739	103
Excavator/loader at landfill	31	15	2
Wind erosion - landfill	1,488	744	112
Wind erosion - greenwaste storage bay	255	128	19
Wind erosion - soil storage area	701	351	53
Wind erosion - aggregate stockpile area	1,275	638	96
Diesel combustion - off-road	665	665	645
Diesel combustion - on-road trucks	151	151	139
Total	28,373	8,784	1,884

6.1.2 Accounting for peak day operations

The emissions presented in **Table 6-1** are estimated based on an annual production rate of 1,000,000 tpa for the MPC, which equates to an average daily processing rate of 2,740 tonnes per day (tpd) or 114 tonnes per hour (tph). When waste separation is optimal, the maximum processing rate is 150 tph; therefore to account for a theoretical worst-case day, the emissions from the MPC are increased by approximately 30% (i.e. 150/114). This, combined with a maximum of 1,000,000 tpa directed to landfill provides a worst-case assessment for peak day operations.

6.2 Odour emissions

The facility operates as a general solid waste (non-putrescible) landfill, and therefore odour emissions can be expected to be less significant when compared with a landfill which accepts putrescible waste (e.g. household waste, food waste, nappies, animal waste etc.). Recent odour audits for the current site found that no significant odour was detected beyond the site boundary (TOU, 2015; SEMA, 2017).

Notwithstanding, a proportion of the incoming waste is organic (wood waste, garden waste, paper and cardboard) and therefore has the potential to generate odour during decomposition. During normal operations the facility would aim to recover as much of this organic waste as possible, and therefore only a small volume of degradable waste would be disposed to landfill.

However, to address EPA's requirements, a worst-case scenario of 1 Mtpa directed to landfilled needs to be considered. Furthermore, although composting is not currently undertaken onsite,

the facility is approved and licenced for this activity and therefore composting is included for a worst-case odour assessment.

The following odour sources are included in the model:

- Landfill (including active tip face, daily cover, intermediate cover and final cap).
- Greenwaste storage.
- Composting (including fresh and aged compost windrows).

One of the main challenges in accounting for an increase in odour emissions from landfilling at an increased rate, is how to appropriately scale existing odour emission data. The odour assessment for the 2008 EIS (HAS, 2008) did not have access to site specific monitoring data and instead used historical odour data from another landfill. After accounting for variations in emissions over time and across the landfill area, the historical emissions data were adjusted pro rata based on the reduced tonnages of organic waste landfilled at the Genesis facility. In other words, because most of the organic waste is recovered at modern landfills, the decomposition and resultant emissions would be much lower than for the historical monitoring data which was used.

An odour assessment undertaken as part of the Independent Environmental Audit in 2015 noted some limitations in this approach and suggested a better approach would be to adjust odour emission rates based on potential fugitive gas emissions (TOU, 2015). However, there are insufficient data available to take this approach and, regardless, for our worst-case scenario of 1 Mtpa landfilled, we have to assume that limited organic waste is recovered.

Site specific odour monitoring was completed onsite in 2013 for sources including the active tip face, the leachate sump/riser and the leachate treatment tanks. While these monitoring results are considered appropriate to derive emission rates for existing operations, no measurements were taken across the covered or capped areas of the landfill, although these areas of the landfill are expected to have low emissions potential. Furthermore, these measurements were taken while the MPC was operational and the organic waste volume may therefore not necessarily be representative of our worst-case scenario.

It is noted that subsequent odour assessments for the site in 2015 (TOU, 2015) and 2017 (SEMA, 2017) completed downwind odour surveys and did not measure odour sources directly. These reports, while useful in providing an indication of existing odour impact, cannot be used to derive odour emission rates for dispersion modelling.

To derive odour emission rates for a worst-case scenario, odour emission data for other putrescible waste landfills was reviewed, with a focus on sites where relatively recent odour monitoring was conducted. A summary of these data is provided in **Table 6-2**.

The approach taken for this assessment is to use the average specific odour emissions rate (SOER, expressed as $\text{OU}\cdot\text{m}^3/\text{m}^2/\text{s}$) from the four putrescible waste landfills presented in **Table 6-2**. As shown, this provides a higher SOER than measurements taken at the existing facility and is generally higher than the emission rates used in the original EIS. To provide an additional level of conservatism, the source areas, across which these SOERs are applied, are scaled from the existing site layout according to the production increase.

Table 6-2: Review of odour emissions data and odour emission rates for modelling

Source	Specific Odour Emission Rate (OU.m ³ /m ² /s)						
	Whytes Gully ¹	Spring Farm ²	Woodlawn ³	Lucas Heights ⁴	SOER Average	Genesis site monitoring	Used in original EIS
Active tip face	1.115	0.424	0.7	*26-40 OU.m ³ /s	0.7	0.4	
Daily cover	1.023	0.069		0.03	0.4		3.83
Intermediate cover	0.035	0.019	0.3	0.05	0.1		
Final cap		0.026			0.03		0.00051
Leachate storage	0.153	0.108	3.6	1.8	1.4	0.2	0.069
Greenwaste storage		1.279	*2.37 OU.m ³ /s	4	2.6		
Compost windrow (fresh)		2.654	5.65	1.95	3.3		0.105
Compost windrow (aged/product)		0.18	0.83	0.34	0.4		
Note: * expressed as an OER (OU.m ³ /s) and not included in the SOER average							
¹ PAEHolmes, 2012							
² Heggies, 2010							
³ GHD, 2015							
⁴ Pacific Environment, 2013							

7. DISPERSION MODELLING RESULTS

7.1 PM₁₀

The predicted ground level concentrations (GLCs) of PM₁₀ at each receptor location are presented in **Table 7-1**. Results are presented for the Modification 6 increment alone, as well as cumulative which includes the addition of the existing background (described in **Section 5.4**).

The highest incremental annual average PM₁₀ concentration at a residential receptor is 2.3 µg/m³ (R05 and R08). The highest incremental annual average PM₁₀ concentration at a commercial receptor is 4.9 µg/m³ (effectively on the site boundary). With the addition of existing background, the cumulative annual average GLCs comply with the impact assessment criterion at all receptor locations.

The highest incremental 24-hour average PM₁₀ concentration at a residential receptor is 10.4 µg/m³ (R05) and 21.6 µg/m³ at a commercial receptor (R12). With the addition of existing background, the cumulative 24-hour average GLCs comply with the impact assessment criterion at all receptor locations.

Table 7-1: PM₁₀ modelling predictions for Modification 6

Receptor ID	Receptor type	Modification 6 increment		Cumulative	
		24-Hour Max	Annual Ave	24-Hour Max ¹	Annual Ave
Criteria		50 µg/m ³	25 µg/m ³	50 µg/m ³	25 µg/m ³
R01	Residential	7.7	1.3	44.1	20.2
R02		8.7	1.6	44.7	20.5
R03		9.1	1.9	43.2	20.8
R04		9.7	2.0	41.8	20.9
R05		10.4	2.3	41.8	21.2
R06		9.6	1.8	42.1	20.7
R07		10.1	2.2	41.8	21.1
R08		10.3	2.3	41.8	21.2
R09		1.7	0.3	42.4	19.2
R10		2.2	0.3	42.5	19.2
R11		2.4	0.4	42.2	19.3
R12	Commercial /industrial	21.6	4.9	49.2	23.8
R13		20.2	4.8	49.9	23.7
R14		11.6	2.8	43.5	21.7
R15		15.1	3.6	46.7	22.5
R16		19.3	4.8	46.2	23.7
R17		14.8	2.5	44.3	21.4
Note: ¹ As described in Section 5 , the background dataset contains four existing exceedances of the impact assessment criteria and the cumulative 24-hour average PM ₁₀ is therefore calculated using the 5 th highest background day (excluding the background days already at or over 50 µg/m ³)					

7.2 PM_{2.5}

The predicted ground level concentrations (GLCs) of PM_{2.5} at each sensitive receptor are presented in **Table 7-2**. Results are presented for the Modification 6 increment alone, as well as cumulative which includes the addition of existing background (described in **Section 5.4**).

The highest incremental annual average PM_{2.5} concentration at a residential receptor is 0.6 µg/m³. The highest incremental annual average PM_{2.5} concentration at a commercial receptor is 1.2 µg/m³ (effectively on the site boundary). With the addition of existing background, the cumulative annual average GLCs exceed the impact assessment criterion at all locations, however this is because the annual average background concentrations of PM_{2.5} already exceed the impact assessment criterion.

The highest incremental 24-hour average PM_{2.5} concentration at a residential receptor is 3.0 µg/m³ (R05). With the addition of existing background, the cumulative 24-hour average GLCs result in additional exceedances of the impact assessment criterion at a number of receptor locations (shown in bold). This is caused by a combination of elevated background with the additional dust emissions from the modification. It is noted that the background PM_{2.5} concentration is already close to the impact assessment criterion (24.4 µg/m³).

Further analysis, showing the risk of additional exceedances above background, as a result of the modification, is presented below.

Table 7-2: PM_{2.5} modelling predictions for Modification 6

Receptor ID	Receptor type	Modification 6 increment		Cumulative	
		24-Hour Max	Annual Ave	24-Hour Max ¹	Annual Ave
		25 µg/m ³	8 µg/m ³	25 µg/m ³	8 µg/m ³
R01	Residential	2.1	0.4	24.8	9.0
R02		2.4	0.5	24.8	9.1
R03		2.6	0.5	25.1	9.1
R04		2.8	0.6	25.3	9.2
R05		3.0	0.6	25.4	9.2
R06		2.6	0.5	25.2	9.1
R07		2.9	0.6	25.3	9.2
R08		2.9	0.6	25.3	9.2
R09		0.5	0.1	24.4	8.7
R10		0.6	0.1	24.4	8.7
R11		0.7	0.1	24.4	8.7
R12	Commercial /industrial	4.8	1.2	26.5	9.8
R13		4.1	1.1	26.9	9.7
R14		2.7	0.7	26.2	9.3
R15		3.3	0.9	26.4	9.5
R16		4.2	1.1	26.8	9.7
R17		3.8	0.7	25.5	9.3

Note: ¹As described in **Section 5**, the background dataset contains five existing exceedances of the impact assessment criteria and the cumulative 24-hour average PM_{2.5} is therefore calculated using the 6th highest background day (excluding the background days already at or over 25 µg/m³)

In addition to the paired-in-time cumulative analysis presented above, to provide an analysis of the statistical likelihood of compliance with the impact assessment criterion, every predicted 24-hour average concentration (366 individual concentrations) has been paired with multiple years of measured 24-hour average concentrations from the NSW OEH Prospect and St Marys sites (a total of 1,007 measurements). Each combination of model prediction and recorded concentration (376,190 potential combinations) is combined, assuming that any background value from the data set could occur on any given day of the proposed operations.

For the receptors presented in **Table 7-2** with additional exceedance days (residential receptors R3 to R8 and commercial receptors R12 to R17), the number of cumulative 24-hour average $PM_{2.5}$ concentrations greater than $25 \mu g/m^3$ is presented in **Figure 7-1**.

The analysis shows that for residential and commercial receptors, risk of any additional exceedances of the 24-hour $PM_{2.5}$ impact assessment criterion does not increase significantly, above what is already caused by background (i.e. up to one additional day as a worst case).

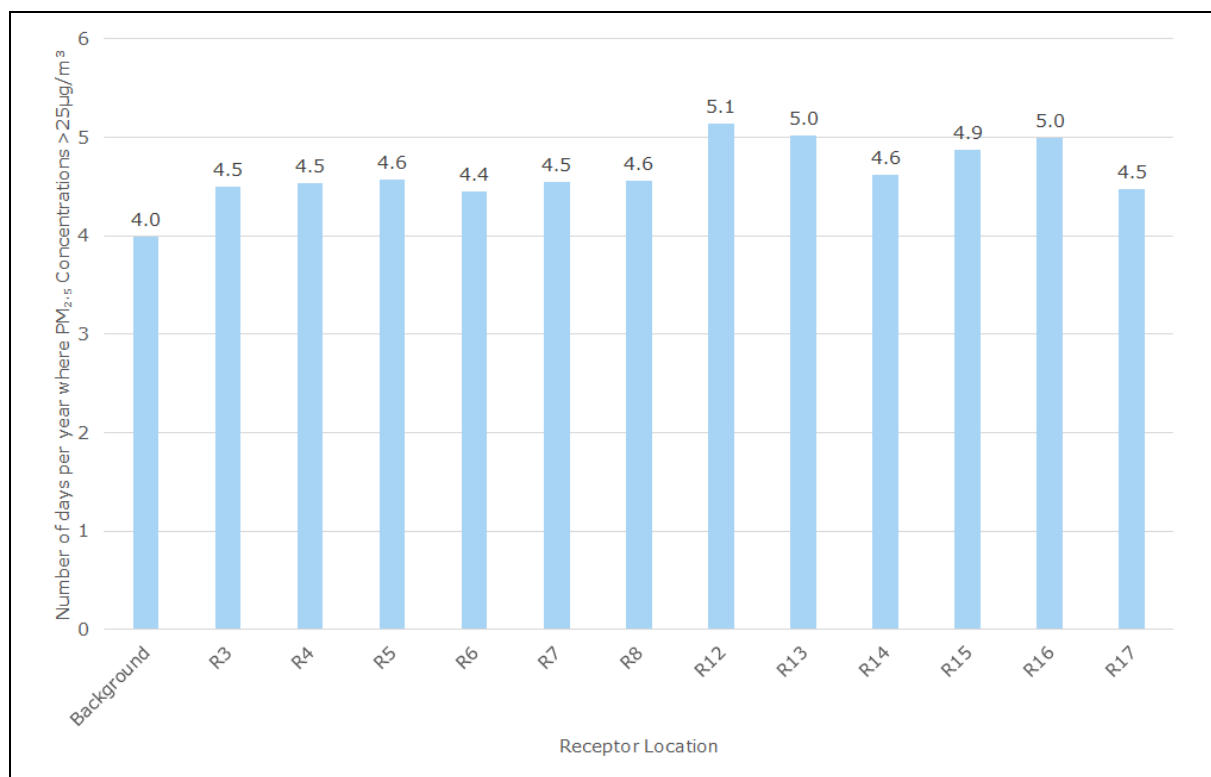


Figure 7-1: Frequency distribution of cumulative 24-hour average $PM_{2.5}$ concentration

7.3 TSP and Dust Deposition

The predicted ground level concentrations (GLCs) of TSP and dust deposition at each receptor are presented in **Table 7-3**. Results are presented for the Modification 6 increment alone, as well as cumulative which includes the addition of existing background (described in **Section 5.4**).

The incremental increase in annual average TSP is minor and with the addition existing background, the cumulative annual average GLCs comply with the impact assessment criterion at all receptor locations. Similarly, the predicted dust deposition complies with both the incremental and cumulative impact assessment criteria at all receptor locations.

Table 7-3: TSP and dust deposition modelling predictions for Modification 6

Receptor ID	Receptor type	Modification 6 increment		Cumulative	
		TSP	Dust Depos	TSP	Dust Depos
		90 µg/m ³	2 g/m ² /month	90 µg/m ³	4 g/m ² /month
R01	Residential	2.0	0.1	49.2	2.1
R02		2.6	0.1	49.8	2.1
R03		3.0	0.1	50.2	2.1
R04		3.2	0.1	50.4	2.1
R05		3.6	0.2	50.8	2.2
R06		2.8	0.1	50.0	2.1
R07		3.4	0.1	50.6	2.1
R08		3.6	0.1	50.8	2.1
R09		0.4	0.0	47.6	2.0
R10		0.4	0.0	47.6	2.0
R11		0.4	0.0	47.6	2.0
R12	Commercial /industrial	9.9	0.5	57.1	2.5
R13		10.2	0.5	57.4	2.5
R14		5.0	0.3	52.2	2.3
R15		7.5	0.4	54.7	2.4
R16		12.3	0.7	59.5	2.7
R17		5.4	0.3	52.6	2.3

7.4 Odour

A theoretical worst-case odour scenario is modelled based on the potential for landfilling to occur up to the 1 Mtpa, in addition to greenwaste processing through the MPC (storage, processing and composting). It is noted that greenwaste processing is currently limited to shredding to produce various mulch products. However, as the facility is approved for composting, this is also included as an odour source in the modelling, nominally placed within the current greenwaste storage area.

The predicted ground level concentrations (GLCs) of odour for this worst-case scenario are presented in **Table 7-4**. All modelling predictions at residential receptors are below odour goal of 2 OU and therefore comply with the impact assessment criteria. Modelling predictions at commercial receptors are all less than 7 OU, which is considered an appropriate odour goal for this type of receptor.

Table 7-4: Predicted ground level concentration of odour (99th percentile, nose response average)

Receptor ID	Receptor type	Modification 6 increment
		Odour
		2 OU
R01	Residential	<1
R02		1
R03		1
R04		<2
R05		<2
R06		1
R07		<2
R08		1
R09		<1
R10		<1
R11		<1
R12	Commercial /industrial	2
R13		3
R14		2
R15		2
R16		3
R17		2

8. MANAGEMENT AND MONITORING

The principal fugitive dust emission sources during operation are:

- Movement of vehicles on travel routes and re-entrainment of dust from paved and unpaved surfaces.
- Material handling (trucks unloading, loading, screening, crushing, sorting).
- Wind erosion from exposed surfaces and stockpiles.
- Diesel vehicle exhaust from the trucks, front end loaders, excavators etc.

The existing and proposed dust controls include:

- Enclosure of material handling and processing and storage within the MPC shed.
- Misting sprays operated within the shed to dampen material as it is sorted and before being loaded to the hopper.
- The majority of travel routes onsite are sealed (exceptions are the haul route into the pit and within the segregated materials area).
- Water sprays on the mobile crusher and shredder.
- Fixed water sprays on product storage areas.
- Water truck operating on unsealed haul road into the pit, within the landfill and on the paved roads as needed.
- Speed limit of 40km/hr for unsealed haul road into the pit.
- Water cannon operating within the pit.
- Established earth bund along the northern boundary of the pit.
- A fixed water spray system operates on the access roadway.

The existing facility operates under an Operational Environmental Management Plan (OEMP) which outlines the roles, responsibilities and the tasks to be performed to ensure environmental impacts are minimised. The OEMP will be reviewed and updated, where required, for the modification.

Based on the modelling results presented in this report, the existing controls appear to be effective in preventing dust impacts in surrounding residential areas. This conclusion is supported by the existing monitoring data which demonstrate compliance with impact assessment criteria at the site boundary (dust deposition) and in the suburb of Minchinbury (PM₁₀).

There is a small risk of additional exceedances of the 24-hour average PM_{2.5} concentrations at residential and commercial receptor locations (i.e. up to one additional day as a worst case). To better monitor the effectiveness of existing controls and ongoing performance of the site, the proponent will consider relocating the PM₁₀ monitoring site in Minchinbury to a boundary location at the northern and/or eastern site boundary. The four existing boundary dust deposition monitoring sites remain appropriate for the modification.

9. CONCLUSION

Local air quality impacts are assessed using a Level 2 assessment approach in accordance with the Approved Methods. Emissions are estimated for all activities and dispersion modelling is used to predict ground level concentrations at surrounding sensitive receptors. Cumulative impacts are assessed by combining the contribution from the modification with the existing ambient baseline.

A worst-case emissions assessment is considered based on a 50/50 split between the MPC and landfill. Modelling a scenario with 1,000,000 tpa hauled to landfill provides a conservative worst-case assessment of impacts, as hauling along the unsealed access road to the pit is the largest potential source.

The predicted cumulative annual average PM_{10} concentrations comply with the impact assessment criterion at all receptor locations. With the addition of existing background, there are no additional exceedances of the 24-hour average PM_{10} impact assessment criterion at any receptor location.

The cumulative annual average $PM_{2.5}$ concentrations exceed the impact assessment criterion at all locations, however this is because the annual average background concentrations of $PM_{2.5}$ already exceed the impact assessment criteria. The cumulative 24-hour average $PM_{2.5}$ concentrations result in additional exceedances of the impact assessment criterion at residential and commercial receptor locations. It is noted that the background $PM_{2.5}$ concentration is already close to the impact assessment criterion ($24.4 \mu g/m^3$). Furthermore, additional statistical analysis shows that the probability or risk of any additional exceedances of the 24-hour $PM_{2.5}$ impact assessment criterion does not significantly increase, above what is already caused by background (i.e. up to one additional day as a worst case).

Cumulative annual average TSP concentrations comply with the impact assessment criterion at all receptor locations. Similarly, predicted dust deposition levels comply with both the incremental and cumulative impact assessment criteria at all receptor locations.

The worst case potential odour impact from landfilling at 1 Mtpa combined with greenwaste processing and composting, would not result in exceedances of the odour goal of 2 OU at any residential receptor.

To better monitor the effectiveness of existing controls and ongoing performance of the site, the proponent will consider relocating the PM_{10} monitoring site in Minchinbury to a boundary location at the northern and/or eastern site boundary.

10. REFERENCES

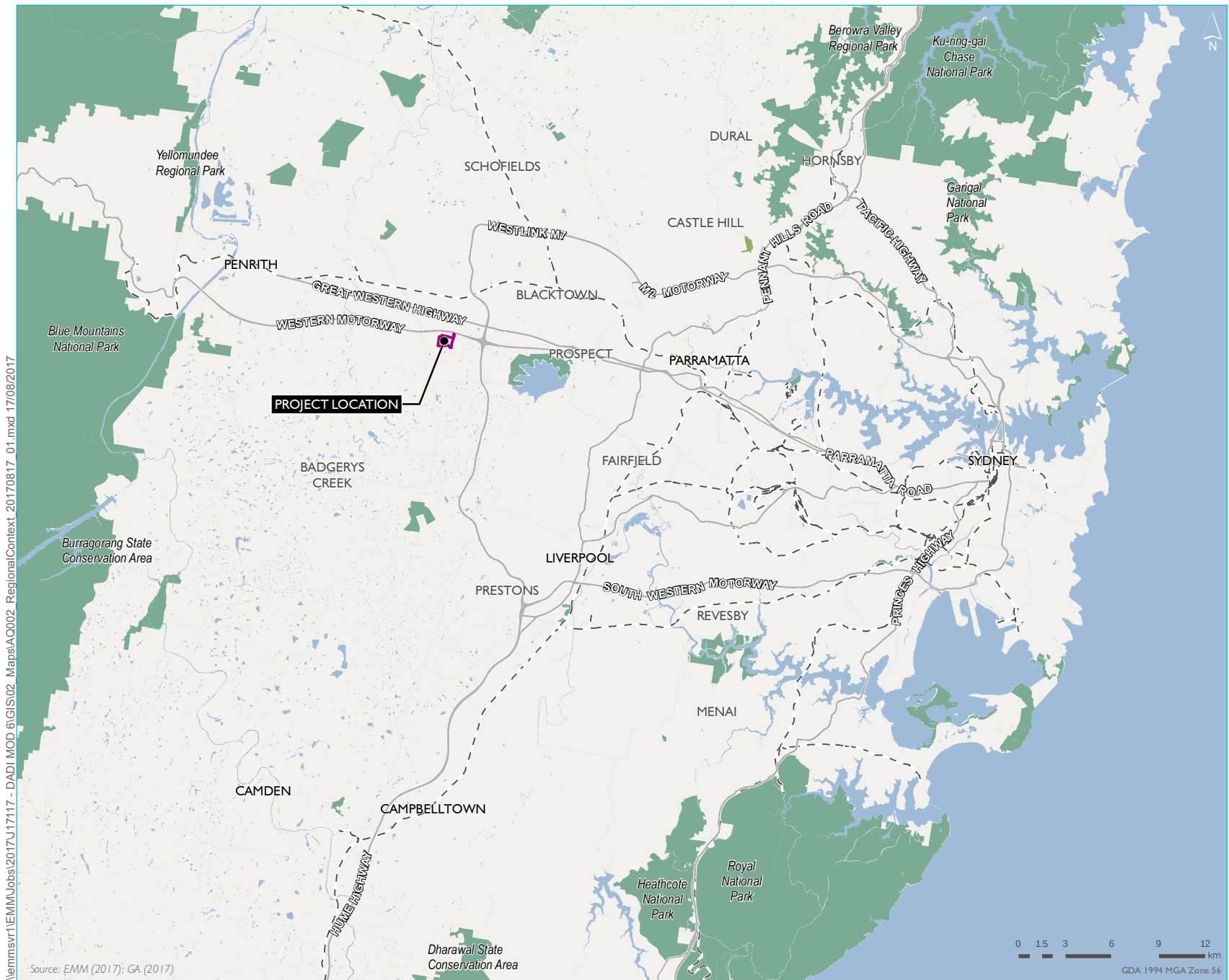
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APPENDIX 1

FIGURES

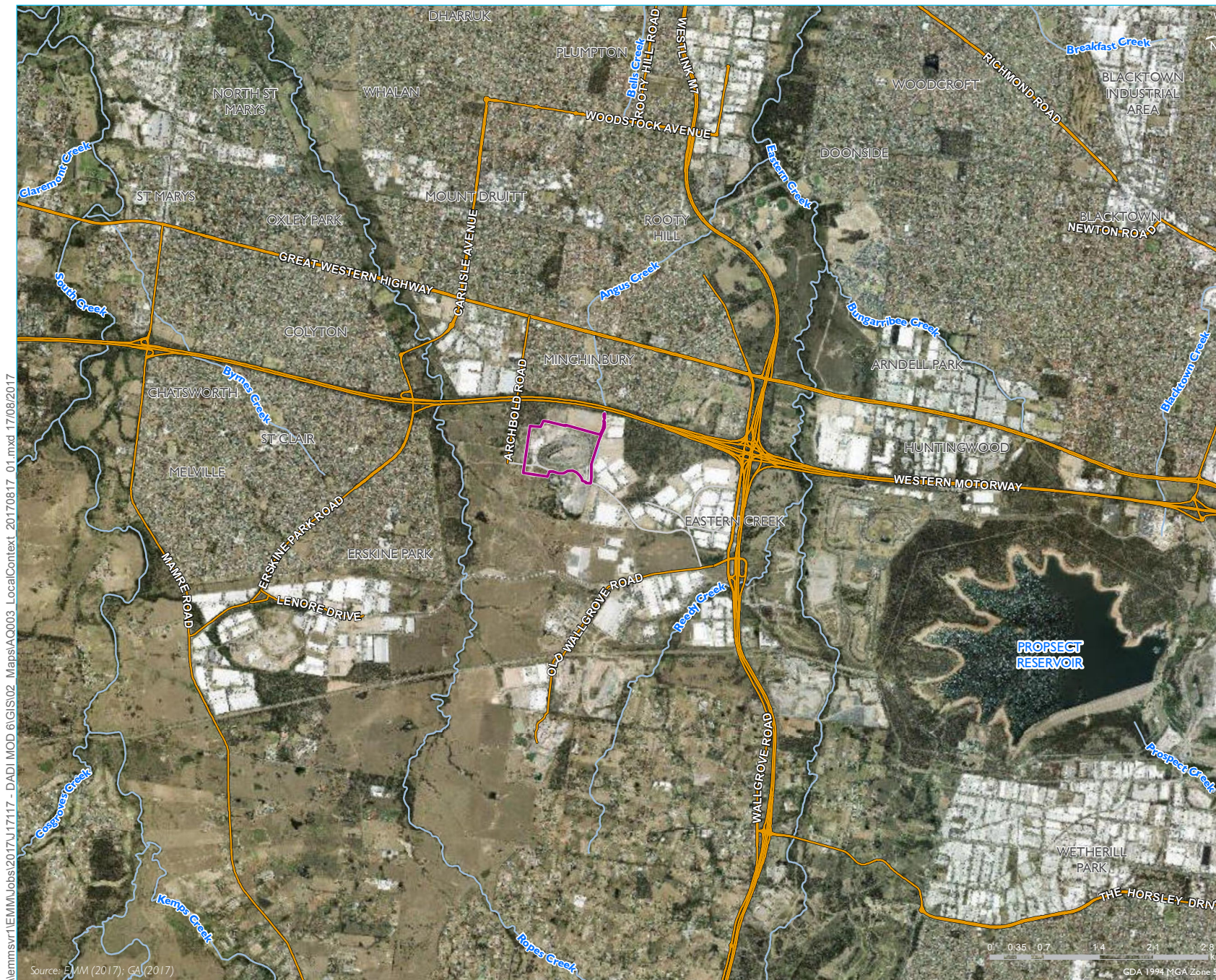


- KEY**
- Site location
 - Main roads
 - Waterbodies
 - NPWS reserve
 - State forest

Regional context

Genesis Zero Waste
Modification 6
Air quality impact assessment
Figure 1.1





- KEY**
- Site location
 - Main road
 - Local road
 - Watercourse

Local context

Genesis Zero Waste
Modification 6
Air quality impact assessment
Figure 1.2



APPENDIX 2

MODEL SETTINGS

Table A2-1: TAPM settings

Parameter	Setting
Model Version	TAPM v.4.0.5
Number of grids (spacing)	4 (30 km, 10 km, 3 km, 1 km)
Number of grid points	25 x 25
Vertical grids / vertical extent	30 / 8000m (~400mb)
Centre of analysis	Lat 150.824997, long -33.7999992 Easting 298655, Northing 6257892S
Year of analysis	2016
Terrain and landuse	Terrain data using NASA SRTM3 database. Default TAPM values based on land-use and soils data sets from Geoscience Australia and the US Geological Survey, Earth Resources Observation Systems (EROS) Data Center Distributed Active Archive Center (EDC DAAC).
Assimilation sites	NSW OEH - St Marys BoM - Horsley Park Equestrian Centre, Badgerys Creek AWS, Penrith Lakes AWS, Bankstown Airport, Holsworthy Control Range, Sydney Olympic Park, Richmond RAAF and Camden Airport.

Table A2-2: CALMET settings

Parameter	Setting
Grid domain	60 km x 60 km
Grid resolution	0.5 km
Number of grid points	120 x 120
Reference grid coordinate	268.900, 6228.200
Vertical grids / vertical extent	10 cell heights / 4,000m
Upper air meteorology	Prognostic 3D.dat extracted from TAPM at 1 km grid
Surface observations	NSW OEH - St Marys BoM - Horsley Park Equestrian Centre, Badgerys Creek AWS, Penrith Lakes AWS, Bankstown Airport, Holsworthy Control Range, Sydney Olympic Park, Richmond RAAF and Camden Airport.

Table A2-3: CALMET model options

Flag	Description	Recommended setting	Value used
NOOBS	Meteorological data options	0,1,2	1 - combination of surface and prognostic data
ICLOUD	Cloud Data Options – Gridded Cloud Fields	4	4 -Gridded cloud cover from Prognostic relative humidity at all levels (MM5toGrads algorithm)
IEXTRP	Extrapolate surface wind observations to upper layers	-4	-4 - similarity theory used
IFRADJ	Compute Froude number adjustment effects	1	1 - applied
IKINE	Compute kinematic effects	0	0 - not computed
BIAS (NZ)	Relative weight given to vertically extrapolated surface observations vs. upper air data	NZ * 0	NZ * 0 - layers in lower levels of model will have stronger weighting towards surface, higher levels will have stronger weighting to upper air data
TERRAD	Radius of influence of terrain	No default (typically 5-15km)	5 km

Table A2-3: CALMET model options

Flag	Description	Recommended setting	Value used
NOOBS	Meteorological data options	0,1,2	1 - combination of surface and prognostic data
ICLOUD	Cloud Data Options – Gridded Cloud Fields	4	4 -Gridded cloud cover from Prognostic relative humidity at all levels (MM5toGrads algorithm)
RMAX1 and RMAX2	Maximum radius of influence over land for observations in layer 1 and aloft	No Default	10 km, 20km
R1 and R2	Distance from observations in layer 1 and aloft at which observations and Step 1 wind fields are weighted equally	No Default	R1 - 2 km, R2 – 5 km

Table A2-4: CALPUFF model options

Flag	Description	Value used	Description
MCHEM	Chemical Transformation	0	Not modelled
MDRY	Dry Deposition	1	Yes
MWET	Wet Deposition	0	Not modelled
MTRANS	Transitional plume rise allowed?	1	Yes
MTIP	Stack tip downwash?	1	Yes
MRISE	Method to compute plume rise	1	Briggs plume rise
MSHEAR	Vertical wind Shear	0	Vertical wind shear not modelled
MPARTL	Partial plume penetration of elevated inversion?	1	Yes
MSPLIT	Puff Splitting	0	No puff splitting
MSLUG	Near field modelled as slugs	0	Not used
MDISP	Dispersion Coefficients	2	Based on micrometeorology
MPDF	Probability density function used for dispersion under convective conditions	1	Yes
MROUGH	PG sigma y,z adjusted for z	0	No
MCTADJ	Terrain adjustment method	3	Partial Plume Adjustment
MBDW	Method for building downwash	1	ISC Method

APPENDIX 3 WIND ROSES

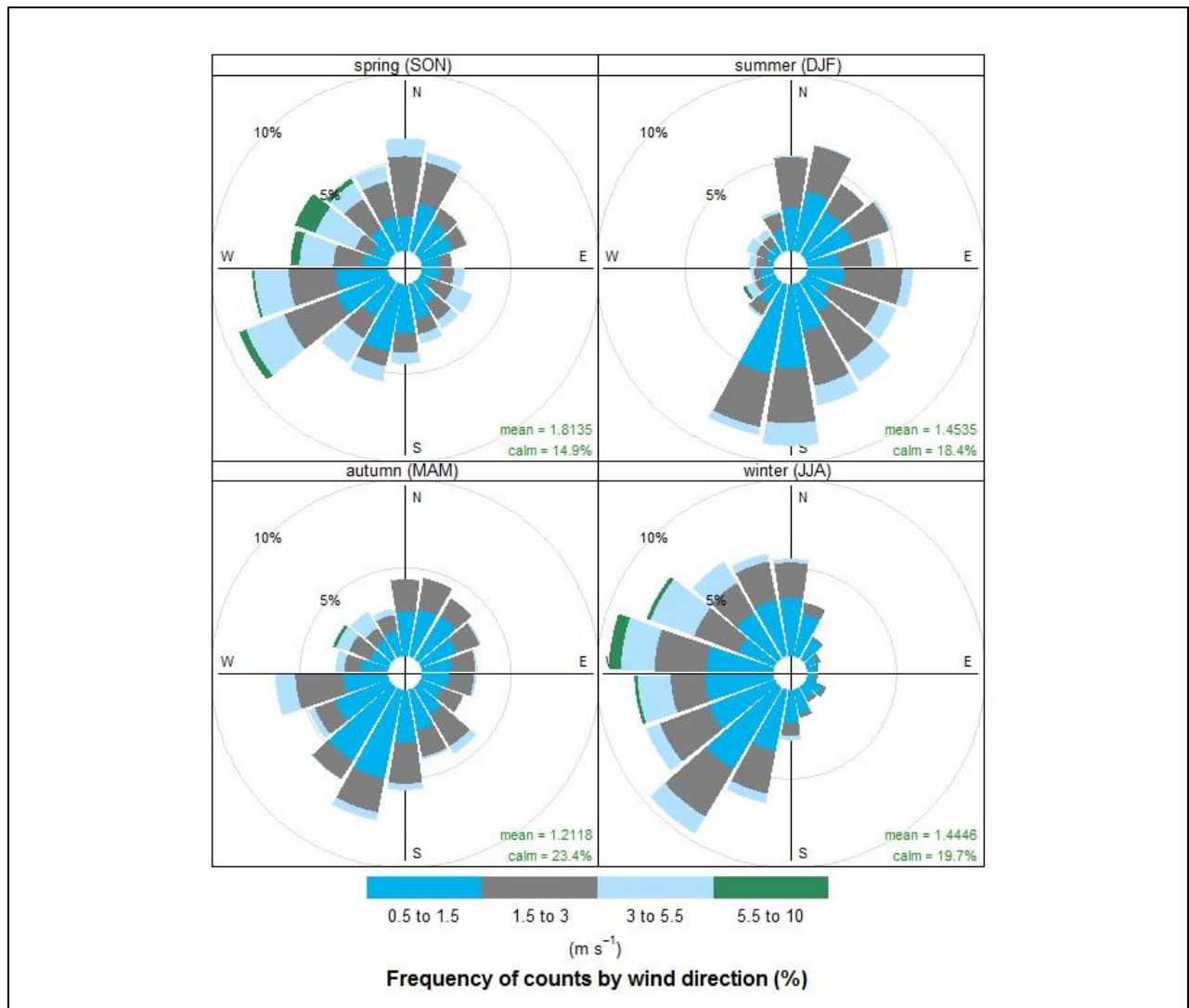


Figure A3-1: Seasonal wind rose

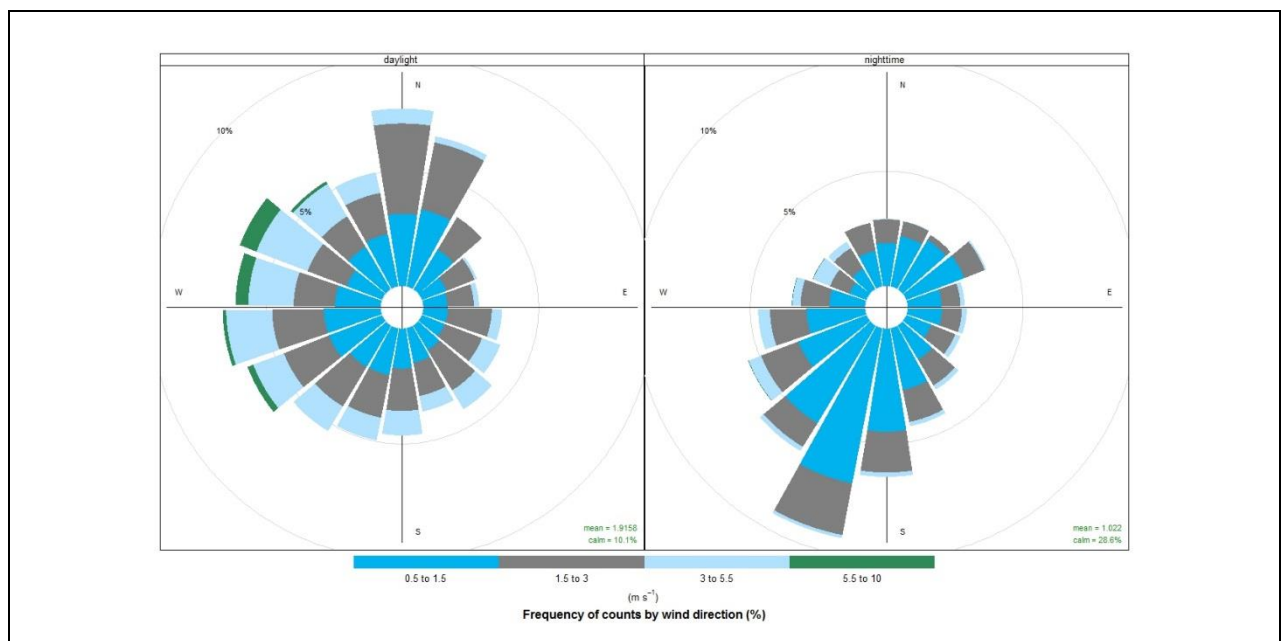


Figure A3-2: Diurnal wind rose

APPENDIX 4

EMISSIONS INVENTORY DEVELOPMENT

Dust emissions were estimated using US EPA AP-42 emission factors and predictive equations taken from the following chapters:

- Chapter 11.9 Western Surface Coal Mining.
- Chapter 13.2.2 Unpaved Roads.
- Chapter 13.2.1 Paved Roads
- Chapter 13.2.4 Aggregate Handling and Storage Piles.
- Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.
- Chapter 13.2.5 Industrial Wind Erosion.

The material properties listed in **Table A4-1** are used as input to the various emission factor equations listed in **Table A4-2** to derive site specific uncontrolled emission factors for each source.

Table A4-1: Material properties

Properties	Value	Source of Information
Silt loading of paved surface	- 0.6 g/m ² - 7.4 g/m ²	AP42 13.2.1 Table 13.2.1-2 - for access road based on baseline for traffic less than 500 (average daily traffic) - for other internal road based on value for municipal solid waste landfills
% silt content for unpaved roads	6.4%	AP42 13.2.2 Table 13.2.2-1 based on value for municipal solid waste landfills
<u>Return travel distances</u> Site access to weighbridge/MPC Rehandle to product storage Product trucks leaving site In pit unsealed road	2.1 km 0.5 km 2.4 km 2.0 km	Estimated from aerial photography
Average truck load	50 t	average for all trucks
Truck weight	45 t	Average of loaded and unloaded vehicle mass
Moisture content of raw material and product	2%	AP42 13.2.4 Table 13.2.4-1 – value for stone quarrying and processing – various limestone products
<u>Areas for wind erosion</u> Landfill Greenwaste storage Aggregate storage Soil storage area	5.0 ha 0.6 ha 3.0 ha 1.7 ha	Estimated from aerial photography

Emissions were quantified for each particle size fraction, with the TSP size fraction also used to predict dust deposition rates. Fine particles (PM₁₀ and PM_{2.5}) were estimated using the fraction specific equations or ratios for the different particle size fractions available within the literature (shown in **Table A4-2**). Emissions from onsite diesel consumption are estimated as follows:

- For on-road trucks, we have assumed a truck fuel consumption of 56.9 litres per 100 km (based on the ABS survey of motor vehicle use) and emission factors of 1.2 kg/kL and 1.1 kg/kL for PM₁₀ and PM_{2.5} (based on NPI emission factor for heavy goods vehicle).
- For onsite equipment, (i.e. excavators, FELs, dozers, dump trucks, crushers, screens etc) a combined annual diesel consumption of 1007kL is assumed based on the reported consumption for NGERS reporting. US EPA Tier 2 emission factors (kg/kL) are assumed.

Table A4-2: Equations and emission factors

Inventory activity	Units	TSP emission factor/equation	PM ₁₀ emission factor/equation	PM _{2.5} emission factor/equation	EF source
Material handling (loading trucks unloading trucks, loading screens etc)	kg/t	$0.74 \times 0.0016 \times \left(\frac{\left(\frac{U}{2.2} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}} \right)$	$0.35 \times 0.0016 \times \left(\frac{\left(\frac{U}{2.2} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}} \right)$	$0.053 \times 0.0016 \times \left(\frac{\left(\frac{U}{2.2} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}} \right)$	AP42 13.2.4
Wind erosion	kg/ha/yr	0.85×1000	$0.5 * \text{TSP}$	$0.075 * \text{TSP}$	AP42 11.9 & 13.2.5
Hauling on sealed surfaces	g/VKT	$3.23 \times sL^{0.91} \times W^{1.02}$	$0.62 \times sL^{0.91} \times W^{1.02}$	$0.15 \times sL^{0.91} \times W^{1.02}$	AP43 13.2.1
Hauling on unsealed roads	kg/VKT	$\left(\frac{0.4536}{1.6093} \right) \times 4.9 * \left(\frac{s}{12} \right)^{0.7} \times \left(\frac{W \times 1.1023}{3} \right)^{0.45}$	$\left(\frac{0.4536}{1.6093} \right) \times 1.5 * \left(\frac{s}{12} \right)^{0.9} \times \left(\frac{W \times 1.1023}{3} \right)^{0.45}$	$\left(\frac{0.4536}{1.6093} \right) \times 0.15 * \left(\frac{s}{12} \right)^{0.9} \times \left(\frac{W \times 1.1023}{3} \right)^{0.45}$	AP42 13.2.2
Screening	kg/t	0.0125	0.0043	0.00043	AP42 11.19.2
Crushing	kg/t	0.0027	0.0012	0.0001	AP42 11.19.2
Dozers	kg/hr	$2.6 \times \frac{s^{1.2}}{M^{1.3}}$	$0.3375 \times \frac{s^{1.5}}{M^{1.4}}$	$0.105 \times \text{TSP}$	AP42 11.9

Note: VKT = vehicle kilometre travelled; U = wind speed (m/s); M = moisture content (%); s = silt content (%); W = vehicle weight (t); S = speed (km/hr); ha = hectares, sL = silt loading

[illegible]

[illegible]

[illegible]

APPENDIX 5 CONTOUR PLOTS

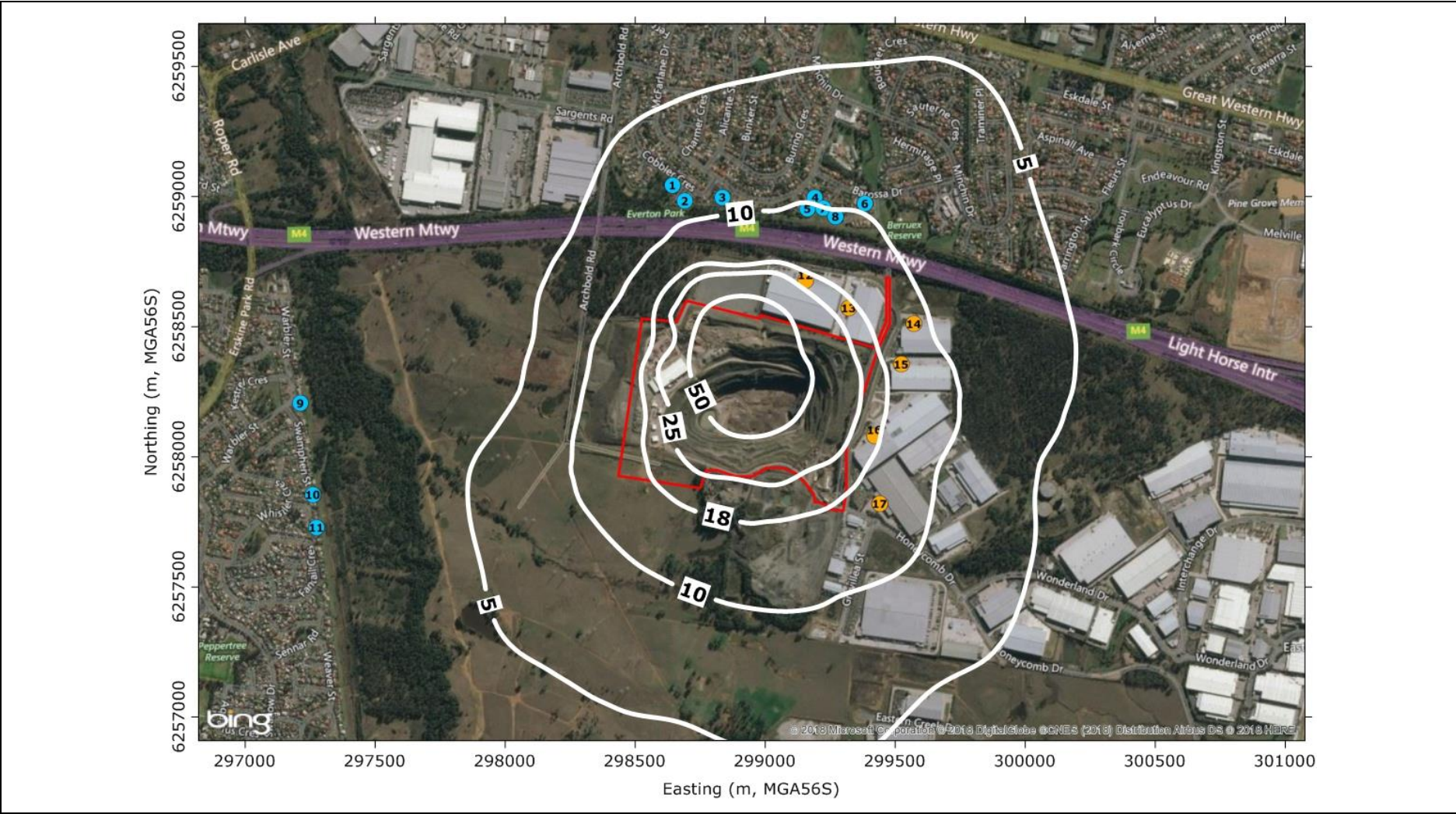


Figure A5-1: Predicted Project-only 24-hour average PM₁₀ concentration (µg/m³)



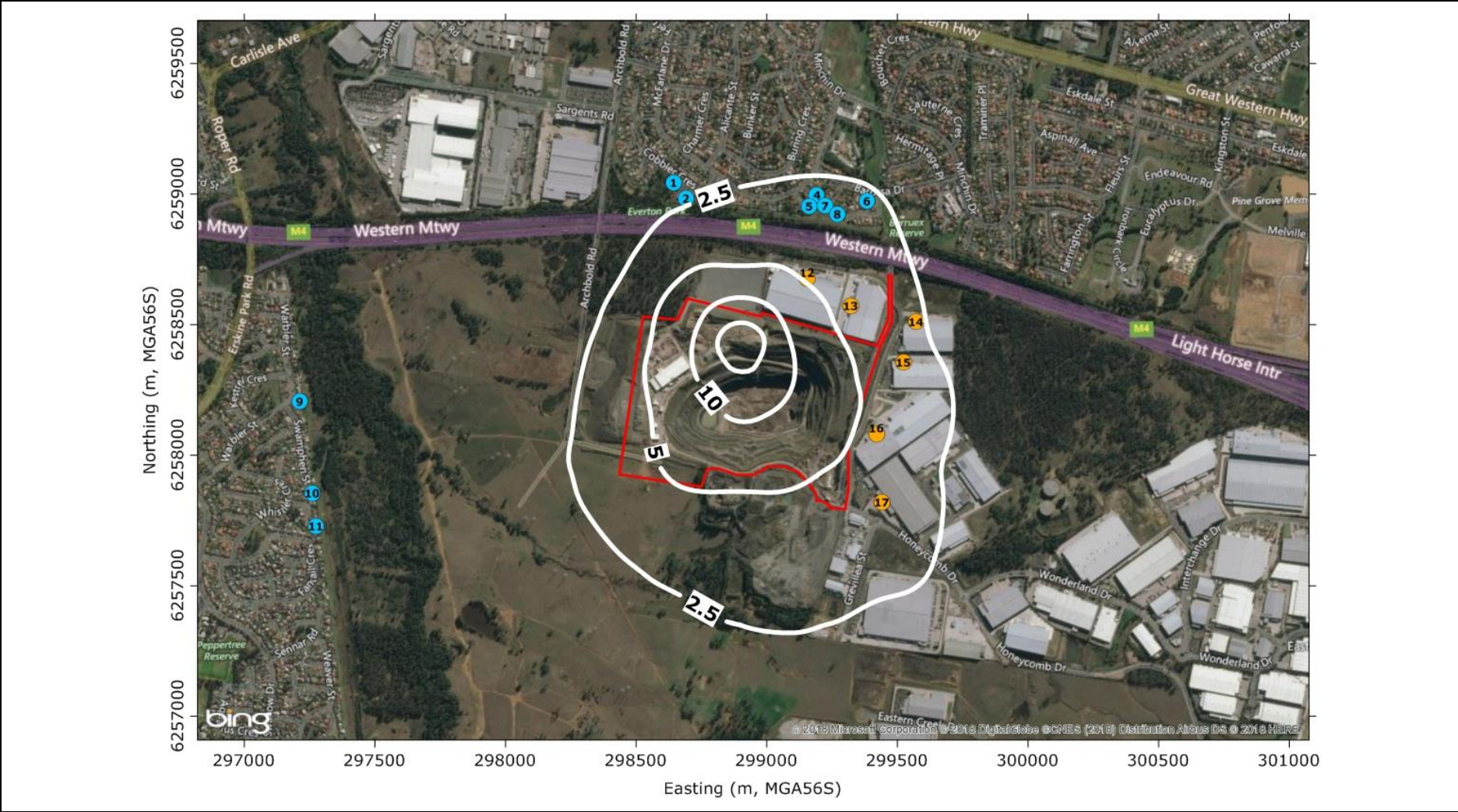


Figure A5-3: Predicted Project-only 24-hour average PM_{2.5} concentration (µg/m³)

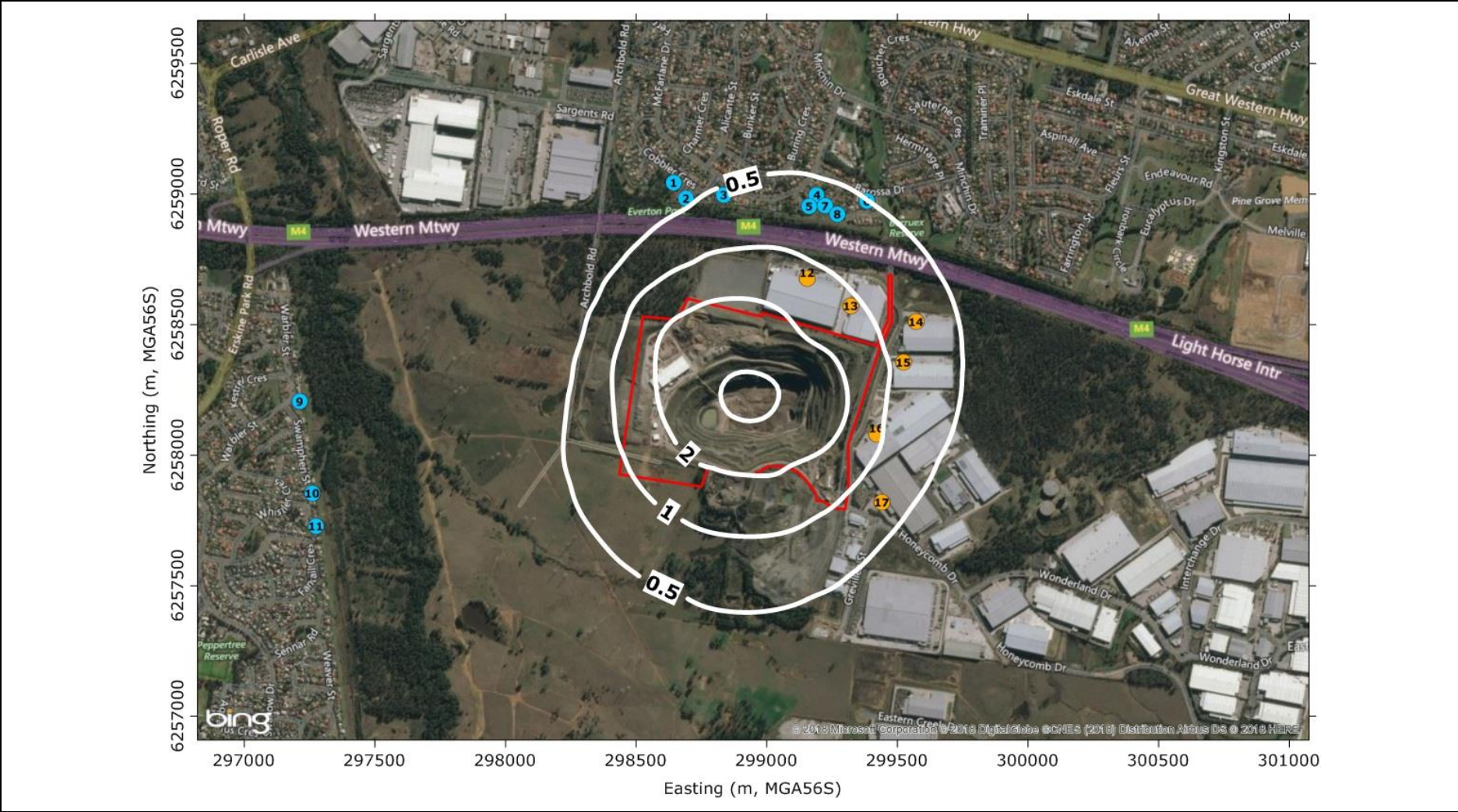


Figure A5-4: Predicted Project-only annual average PM_{2.5} concentration (µg/m³)

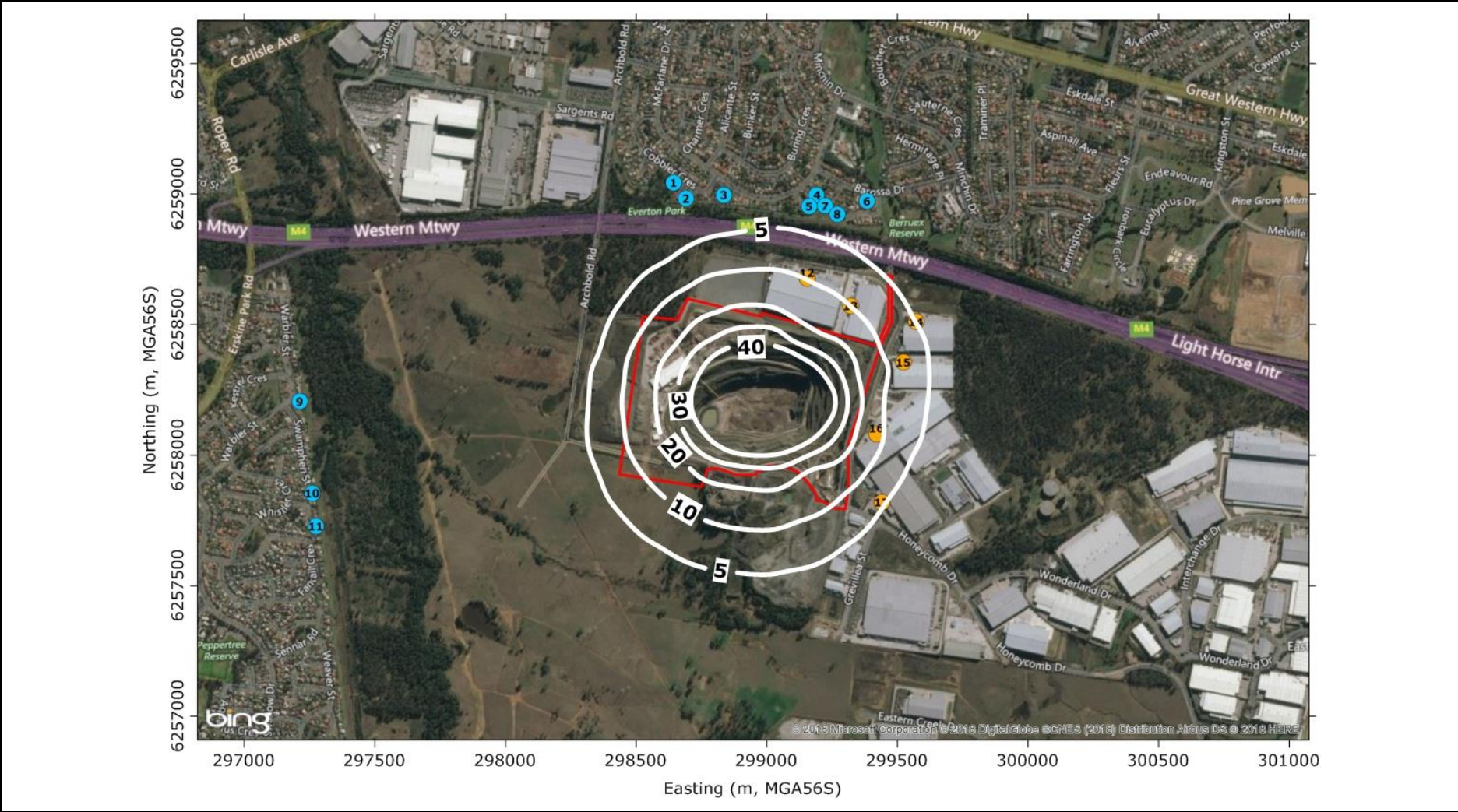


Figure A5-5: Predicted Project-only annual average TSP concentration ($\mu\text{g}/\text{m}^3$)

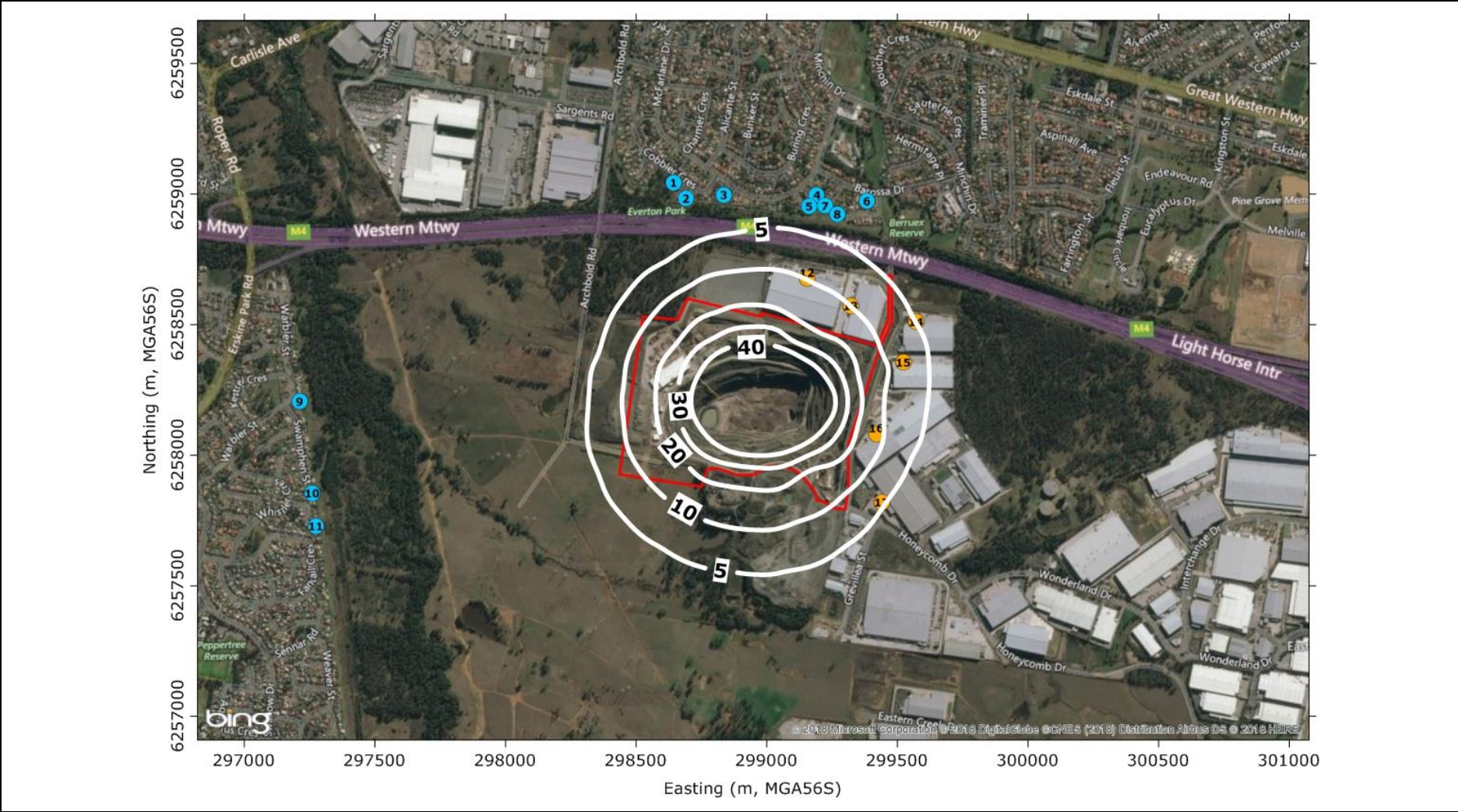


Figure A5-6: Predicted Project-only annual average dust deposition (g/m²/month)

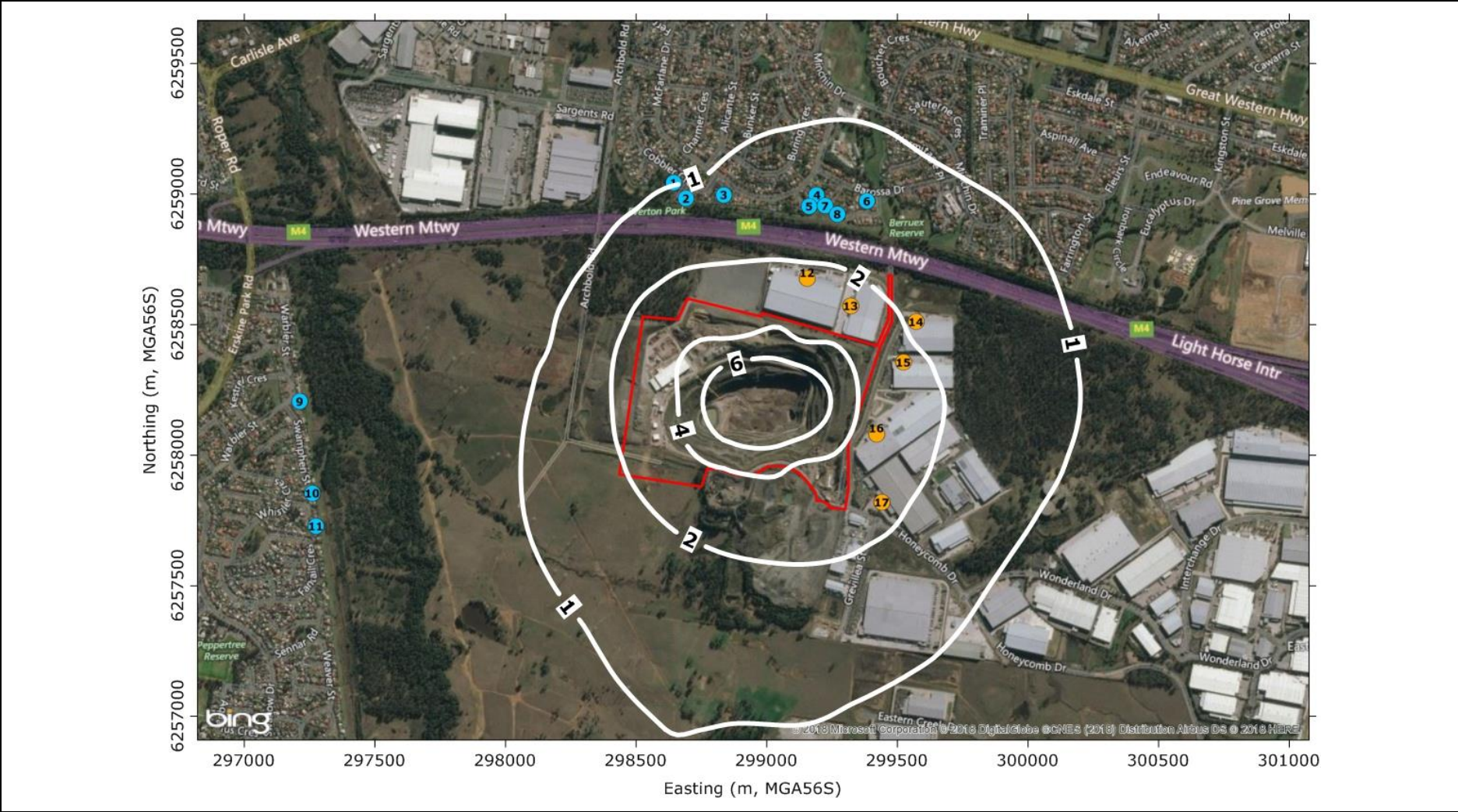


Figure A5-7: Predicted ground level concentration of odour (OU 99th percentile, nose response average)

Appendix F

Allens Linklater letter (2 August 2019)

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2 August 2019

Department of Planning, Industry and Environment
Level 22, 320 Pitt Street
Sydney NSW 2000

Attention: Kelly McNicol / Bianca Thornton

Dear Mr McNicol and Ms Thornton

**Genesis Waste Management Facility Modification 6 (MP 06_0139 MOD 6)
Hours of Operation and Landfill Cap – Response to Submissions Report
Submission on behalf of Jacfin Pty Ltd**

We act for Jacfin Pty Ltd (**Jacfin**).

We refer to the submission previously made by Jacfin dated 24 October 2018 (**Jacfin Submission**) in relation to the application by Dial a Dump Industries (EC) Pty Limited (**Proponent**) to modify the hours of operation and landfill cap applicable to the Genesis Waste Management Facility (**Facility**) (MP 06_0139 MOD 6) (**Modification Application**).

This further submission is made on behalf of our client in relation to the Response to Submissions report (**RtS Report**) dated 28 May 2019 submitted by the Proponent. While the RtS Report has not been placed on formal exhibition, the Department has indicated that it will consider any feedback on the RtS Report while finalising its assessment.

As outlined in the Jacfin Submission, our client's land is situated to the south of the Facility, and our client considers the property is likely to be significantly affected by the modifications sought to the operation of the Facility in the Modification Application.

Jacfin has commissioned independent peer reviews of the following aspects of the RtS Report:

- air quality and odour impacts, by Katestone;
- noise impacts, by Wilkinson Murray.

Copies of these independent peer reviews are **attached** to this submission.

We note that this submission has been prepared in consultation with Richard Lancaster SC.

1 Summary

Jacfin submits that:

- (a) The proposal to increase the landfill cap will result in unacceptable increases in air quality and odour impacts.

Our Ref QNMS:NJSS:120533997

DTNS 505803712v2 120533997 2.8.2019

- (b) The majority of the deficiencies in the assessments undertaken by the Proponent and key concerns previously raised in the independent expert reports commissioned by Jacfin and included in the Jacfin Submission have not been adequately addressed by the RtS Report.
- (c) The deficiencies in the assessments undertaken by the Proponent make it impossible for the Department to properly assess the air quality, odour and noise impacts of this Modification Application.
- (d) The Facility is out of character with the nature of the existing surrounding area and the type of development that is envisaged in the Eastern Creek Business Hub. Any increase in the landfill cap and extension of hours of operation of the Facility is therefore not appropriate.
- (e) By increasing the landfill cap at the Facility, the proportion of materials received by the Facility that are being recycled will naturally be reduced, contrary to State government policy.
- (f) The Proponent has not addressed concerns that the Modification Application is intended to pave the way for the approval of the proposed Energy from Waste Facility (**EfW Facility**), which has been assessed and determined to be inappropriate by the Independent Planning Commission but is now subject of an appeal to the Land and Environment Court.

2 Air Quality and Odour

Jacfin maintains that the proposed increase to the landfill cap will result in unacceptable increases in the Facility's impacts on air quality and odour emissions. For the most part, the RtS Report does not adequately engage with or respond to the concerns raised in relation to air quality and odour impacts in the Jacfin Submission and by Katestone in its independent peer review of the Air Quality Impact Assessment prepared by Rambol Australia Pty Ltd dated August 2018 (**Air Quality Assessment**).

Katestone has undertaken a peer review of the RtS Report and has indicated that the fundamental concern remains that the Proponent has not demonstrated that a realistic 'worst case scenario' was used for the assessment of odour and air quality impacts for the expansion of landfill.

The RtS Report confirms that the Modification Application is seeking to increase the landfill cap from 700,000 tonnes per annum (**tpa**) to 1,000,000 tpa and to exclude waste generated by recycling processes within the Materials Processing Centre (**MPC**) and the Pre-Sort Building from the landfill cap. The impact of this amendment, if approved, would be that 1,000,000 tpa plus however much additional waste is left over from recycling processes (from the additional 1,000,000 tpa passing through the MPC and Pre-Sort Building) can be deposited to the landfill. Jacfin's concern is that the remaining additional waste has no limit (other than the overall gate limit at the Facility) and therefore could result in a much greater odour and air quality impact than has been estimated. The 'worst case scenario' adopted by the Proponent for the purpose of its air quality and odour assessments does not consider this possibility.

The Proponent has clarified in the RtS Report that the 'worst case scenario' is based on an assumption that 30% of the of 800,000 tpa that is processed by the MPC will go to landfill, being an amount of 240,000 tpa. It is not clear why a figure of 800,000 tpa has been adopted for the total amount of waste that is likely to be processed by the MPC. Based on a gate limit of 2,000,000 tpa for the Facility, and only 1,000,000 tpa being capable of being disposed of directly to the landfill (if the Modification Application were to be approved), an additional 200,000 tpa of waste could be processed by the MPC than what has been assumed in the Proponent's assessments.

Further, there is no guarantee that only 30% of the waste processed by the MPC will end up in the landfill. Theoretically, a 'worst case' scenario' could be any figure up to 1,000,000 tpa, depending on the composition of the waste being processed in the MPC.

Jacfin submits that the Air Quality Assessment and RtS Report therefore do not present a realistic worst case assessment of air quality and odour impacts resulting from the Modification Application and that the impacts could be significantly greater than assessed.

A further assumption made in the Air Quality Assessment and RtS Report is that the residual waste material from the MPC will be transported to the landfill by way of chute. This assumption results in much lower predicted dust emissions than if the waste were to be transported by truck. Katestone identifies that the feasibility of transporting this material by chute has not been established. If the material cannot be transported by chute, for example because there is insufficient chute capacity, the Air Quality Assessment would have further underestimated the 'worst case scenario' and consequently the impacts of the Modification Application.

Katestone has identified that the following further issues previously raised by Jacfin that have not been adequately addressed in the RtS Report:

- (a) The RtS Report does not consider all reasonably foreseeable development in the vicinity of the Facility. The RtS Report considers the Hanson facility to be speculative, rather than a reasonably foreseeable development. The Hanson facility has been granted development approval by Blacktown City Council and should be considered in any assessment of cumulative impacts of the expansion of the landfill.
- (b) The potential impacts of the Modification Application have not been properly assessed as the receptor locations selected in the Air Quality Assessment do not reflect the most affected locations. The RtS Report confirms that the points of reference for commercial and industrial receptors were selected based on where the Proponent considers exposure to dust may occur, rather than the points of greatest potential impact nearest to the Facility. As a result, the Air Quality Assessment has likely underestimated potential impacts.
- (c) The RtS Report does not confirm that best practice measures will be implemented to minimise emissions of PM_{2.5} as far as practicable. Although background annual average concentrations of PM_{2.5} exceed the air quality criterion, the Proponent must ensure that best management practice is implemented to minimise its emissions.
- (d) No additional information has been provided in the RtS Report to support the assumptions made in the Air Quality Assessment relating to haul road lengths. It is not possible to assess whether dust impacts from haulage have been properly identified and therefore whether dust impacts have been underestimated.
- (e) The Proponent has not demonstrated that the control benefits assumed for the mitigation measures are realistic. There has been no validation undertaken and no literature references have been provided to support the assumed effectiveness of the combined controls and provide any confidence that these can be achieved in practice. The level of effectiveness assumed is therefore unreliable.
- (f) Insufficient information has been provided in the Air Quality Assessment and RtS Report to enable the adequacy of the odour assessment undertaken by the Proponent to be assessed. The minimum information requirements specified by the Approved Methods for Modelling have not been met. The odour assessment is therefore inadequate.
- (g) No site specific measurements for odour have been provided. Such measurements are critical to ensure an accurate indication of the likely overall odour impacts from the Modification Application. The adoption of odour emission rates from non-site specific sources is an arbitrary decision which could result in an underestimation of odour impacts.

Katestone has also identified that the following issues previously raised by the Environment Protection Authority (**EPA**) in its submission in relation to the Modification Application have not been adequately addressed in the RtS Report:

- (a) The validation statistics presented in the Air Quality Assessment for the CALMET meteorological file data are unreliable. The meteorological modelling shows 19.1% of calms at the Facility, which is high compared to 10.3% at Prospect. No explanation or justification for the figure adopted for the Facility and no sensitivity analysis has been conducted to explore the consequences of the high level of calms.
- (b) The Air Quality Assessment does not specify the reactive measures that will be implemented if ground level PM10 and PM2.5 criteria are exceeded in the vicinity of the Facility. There can therefore be no confidence that if and when an exceedance occurs the Proponent will be in a position to adequately respond.

Jacfin submits that the numerous deficiencies identified by Katestone and the EPA in relation to the Air Quality Assessment gives rise to a real risk that the air quality and odour impacts associated with the Modification Application have been underestimated. The fact that background levels of PM2.5 already exceed the relevant criteria at certain times is not a valid basis for the Proponent to propose to contribute additional emissions without implementing the best available mitigation measures.

The RtS Report does not address the numerous criticisms of the Air Quality Assessment previously raised by Katestone, including the failure to present the required level of information in relation to the odour assessment to enable the adequacy of the assessment to be interrogated. Jacfin submits that the Air Quality Assessment and RtS Report ought not give the Department any confidence or basis on which to conclude that the air quality and odour impacts associated with the Modification Application will be acceptable.

3 Noise

Jacfin maintains that the substantial increase to the maximum noise levels permitted for the Facility and the increased hours of operation sought in the Modification Application will have unacceptable impacts on surrounding residences.

The RtS Report attaches a report titled Noise and Vibration Impact Assessment prepared by EMM Consulting dated 15 August 2018 (**Updated Noise Assessment**) and indicates that this was the report intended to be lodged with the original Modification Application.

Jacfin has engaged Wilkinson Murray to undertake a peer review of the RtS Report and accompanying Updated Noise Assessment. Wilkinson Murray concludes that the responses provided in the RtS Report and new information presented in the Updated Noise Assessment are largely inadequate and do not address the issues previously raised by Wilkinson Murray.

Wilkinson Murray has identified that the following issues have not been adequately addressed in the RtS Report and Updated Noise Assessment:

- (a) The Proponent has not provided any explanation or justification as to why a significant increase in the noise criteria is appropriate from the currently approved levels, which were previously assessed by the Department and EPA to be appropriate for the Facility.

- (b) The background noise monitoring relied on to set noise criteria in the Updated Noise Assessment is unreliable as it is outdated and was affected by extraneous noise:
 - (i) The RtS Report does establish that the background noise data relied on from March 2014 reflects contemporaneous background noise levels. Transport NSW (Construction Noise and Vibration Strategy / Version 4, 2018) recommends that background noise is re-monitored after 5 years and the data relied upon falls outside of this range.
 - (ii) The RtS Report incorrectly asserts that there is no evidence that the background noise data was affected by extraneous noise. The noise report from which the data was taken contains a statement that insect and frog calls were prominent during evening and night periods. EPA guidelines typically require no extraneous noise be present for the data to be considered valid.
- (c) The RtS does not engage with or provide any explanation as to why current operations are already significantly exceeding the noise criteria previously approved for the Facility by the Department and the EPA under its existing planning approval and environment protection licence.
- (d) The Proponent has not undertaken any quantitative assessment to demonstrate that low frequency noise does not occur at residential receivers. There is therefore a risk that the Updated Noise Assessment may understate the potential noise impacts of the Facility and that the noise criteria being applied by the Proponent is 5dBA higher than permitted.

Wilkinson Murray has also identified that the following issues previously raised by the EPA and Department have not been addressed in the RtS Report and accompanying Updated Noise Assessment:

- (a) The operational noise predictions do not include all relevant noise sources such that the night time noise impacts of the Facility as proposed to be modified might be understated.
- (b) The Proponent has substantially underestimated the sound power levels for the front end loaders and haul trucks that are used at the Facility as a result of adopting noise levels from a data base rather than utilising direct measurements of plant and equipment.
- (c) The RtS Report does not provide an appropriate response to the EPA's concern that the Facility is currently exceeding its approved noise limits.

It is concerning that the Proponent is currently exceeding its approved noise criteria and seeking to use this Modification Application to regularise the existing breach. The RtS Report attempts to justify the exceedance (without directly conceding there is one) on the basis that background noise already exceeds approved limits.

The Proponent's position appears to be that it is entitled to incrementally increase noise from the Facility over time as background noise increases. This approach is fundamentally flawed and inconsistent with the Industrial Noise Policy. Contrary to the approach taken by the Proponent, where background noise is increasing, there is even greater need to control noise emissions from additional sources such as the Facility, to avoid unacceptable noise impacts on residents.

Jacfin submits that the responses provided in the RtS Report and the Updated Noise Assessment fail to address the concerns previously raised by Wilkinson Murray. The numerous deficiencies in the Updated Noise Assessment give rise to a real risk that noise impacts from the Facility have been underestimated and that there will be unacceptable noise impacts on neighbouring residences if the Facility is allowed to operate at noise levels proposed.

4 Character and Context

Jacfin maintains that the Facility is out of character with the nature of development that is envisaged under the Eastern Creek Precinct Plan (Stage 3) (**Precinct Plan**) and the existing development that has occurred throughout the Eastern Creek Business Hub.

The RtS Report responds by noting that *State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP)* makes provision, in Schedule 1, for the Eastern Creek Precinct to include an additional permitted use, being a "waste facility for general solid waste" at the former Wallgrove Quarry.

Simply because a type of development is permissible under a planning instrument does not mean that any such development, regardless of its scale or particular nature, is appropriate for a particular site and consistent with the character and context of the area. For example, a particular development may be appropriate on a small scale or in a particular form only. Furthermore, a particular type of development may have been appropriate and in keeping with the character of an area when it was first approved, but due to the nature of development that has occurred around it over time, is no longer consistent with the character of the area.

On each occasion that consent is sought for a particular development or to expand an existing development, an assessment of the appropriateness of that type of development or the proposed increase in scale or impacts of the development must be carried out.

Jacfin submits that the increase in the landfill cap, hours of operation and approved noise levels for the Facility sought in the Modification Application are inconsistent with the aims of the WSEA SEPP and the objectives of the IN1 zone under the WSEA SEPP, which include to:

- (a) minimise any adverse effect of industry on other land uses;
- (b) encourage a high standard of development that does not prejudice the sustainability of other enterprises or the environment;
- (c) protect and enhance the land to which the Policy applies;
- (d) promote economic development and the creation of employment by providing for development including major warehousing, distribution, freight transport, industrial, high technology and research facilities;
- (e) provide for the co-ordinated planning and development of land in the Western Sydney Employment Area; and
- (f) ensure that development occurs in a logical, environmentally sensitive and cost-effective manner.

The Modification Application is also directly inconsistent with the objective under the Precinct Plan of establishing a high quality industrial precinct.

The expansion of landfilling operations and intensification of impacts of a Facility that is not in keeping with the emerging and future desired character of the Eastern Creek Precinct does not represent orderly and proper planning. Increasing the landfill cap will only increase the noise, air quality and odour impacts of the Facility, as outlined above, and will significantly decrease the attractiveness of surrounding land for high quality employment generating uses, with implications for surrounding land potentially not being utilised for its highest and best use and opportunities to increase employment in the Western Sydney Employment Area being stifled.

The RtS Report responds by stating that a landfill and waste management facility was located in the area at the time that the Precinct Plan was developed and is therefore consistent with the future vision for the area. The RtS Report further asserts that the activities at the Facility can be managed to high environmental standards by environment protection licences.

These responses do not adequately address the concerns raised. The existence of a particular development in an area does not mean that it is compatible with the existing and future character of an area. The character of an area can change over time and new or modified developments should not be approved which would detract from the emerging and future desired character of the area in which they area proposed to be located.

5 Increased Landfill and Reduced Recycling

Jacfin maintains that by increasing the landfill cap at the Facility, recycling will naturally be reduced. The proposed increase in the amount of waste that can be disposed of to landfill from 700,000 tpa to 1,000,000 tpa (not including any waste generated from the MPC) with no associated increase in the overall 'gate' limit of 2,000,000 tpa, will clearly increase the proportion of waste going to landfill, thereby reducing the proportion of waste being recycled.

The RtS Report responds to this by stating that the Modification Application will allow more recycling by excluding waste generated by the MPC from landfill limits and therefore ensuring that it is not constrained in circumstances where the landfill limit has been reached. This may arguably have been the case if the Modification Application was not also seeking to significantly increase the amount of 'direct-to-landfill' waste. If the intention of the Modification Application was truly to increase the amount of recycling that can be undertaken at the Facility, there would be no need to increase the landfill cap for 'direct-to-landfill' waste.

At present, only 700,000 tpa can be deposited to the landfill, such that there is an ability for at least 1,300,000 tpa of waste to be processed by the MPC (and likely more given that a percentage of waste processed by the MPC ends up in landfill in any event). Under the Modification Application, the maximum amount of waste that will be processed by the MPC, assuming that the Proponent receives the maximum permitted amount of 'direct-to-landfill' waste, is 1,000,000 tpa. On this basis it is impossible to accept the Proponent's assertion that the Modification Application will allow more recycling to occur at the Facility.

Jacfin reiterates that increasing the amount of 'direct-to-landfill' waste that can be received by the Facility, thereby reducing the proportion of materials recycled, is directly inconsistent with State government policy relating to recycling including the 'NSW Waste Avoidance and Resource Recovery Strategy 2014-21'. Jacfin submits that the Modification Application should therefore be refused.

6 Energy from Waste Facility

The RtS Report does not adequately respond to the concerns raised in the Jacfin Submission and other community submissions that an increase in landfill waste at the Facility may pave the way for the proposed EfW Facility, which has been assessed and determined to be inappropriate by the Independent Planning Commission but is now subject of an appeal to the Land and Environment Court.

Jacfin considers that the proposal for an EfW Facility adjacent to the Facility and the proposed interaction between the two facilities is a matter that should be considered and responded to by the Proponent.

7 Conclusion

The RtS Report does not adequately address the issues and concerns raised in the Jacfin Submission or by the independent experts retained by Jacfin in relation to the Modification Application. Further, a number of issues raised by the EPA and Department during public exhibition of the Modification Application have also not been addressed in the RtS Report.

The air quality, odour and noise impacts of the Modification Application have not been adequately assessed by the Proponent such that the Department cannot be satisfied that the impacts will be acceptable.

The Modification Application, if approved, will result in unacceptable impacts on surrounding residents and land users, will detract from the future desired character of the area and will reduce recycling. On that basis, Jacfin submits that consent for the Modification Application ought to be refused.

Yours sincerely



Bill McCredie

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Attachments:

Attachment A

'Review of Response to Submissions – Air Quality Assessment' prepared by Katestone dated 1 August 2019.

Attachment B

'Noise Peer Review' prepared by Wilkinson Murray dated 31 July 2019.

2 August 2019

Attn: Bill McCredie

Jacfin
c/o Allens
Deutsche Bank Place
Corner of Hunter & Phillip Streets
Sydney NSW 2000

Email: Bill.McCredie@allens.com.au

Re: Genesis Waste Management Facility Modification 6 (MP 06_0139 MOD 6) – review of Response to Submissions - Air Quality Assessment

Dear Mr McCredie,

I have completed an independent peer review of the response to submissions report (RtS Report) relating to the air quality assessment of the Genesis Waste Management Facility Modification 6 (MP 06_0139 MOD 6) (AQA). Katestone previously conducted a peer review of the AQA and provided a report dated 24 October 2018 raising various issues in relation to the AQA (Katestone Report).

The Genesis Facility is licensed to receive up to 2 million tonnes per annum (Mtpa) of waste and has a cap on landfilling of 700,000 tpa. The proponent is seeking to increase the landfilling cap to 1Mtpa and to exclude from the cap waste generated by the recycling processes within the Materials Processing Centre (MPC).

You have requested that I conduct a review of the RtS Report and consider whether these documents:

- adequately address the issues raised in my earlier report or whether these issues remain outstanding; and
- raise any new or additional issues (including whether I would support the additional air quality issues raised by the EPA and addressed in the RtS).

Attachment A sets out the key issues raised in the earlier Katestone Report and our comments on the adequacy of the responses to those issues provided in the RtS Report. The key issues that remain outstanding are:

- The RtS does not demonstrate that a realistic worst-case scenario has been modelled.
- The RtS has not considered all reasonably foreseeable developments in the vicinity of the site.
- The AQA has failed to properly assess the potential impacts of the proposal at the nearest point of potentially affected receptors.
- The AQA does not demonstrate that best management practice will be implemented to minimise emissions of PM_{2.5} as far as is practical.
- No additional information has been provided in the RtS to support the assumptions relating to haul road lengths. It is therefore not possible to assess whether dust impacts from haulage have been properly characterised.
- The RtS does not demonstrate that the control benefits that were adopted in the AQA are realistic.
- The RtS does not present sufficient information to assess the adequacy of the odour assessments.

- The AQA has not used site-specific measurements of odour which would provide a much more accurate indication of likely overall odour impacts from the proposed development.

Please call me if you would like to discuss.

Regards,

A handwritten signature in black ink, appearing to read 'S. Welchman', with a long horizontal stroke extending to the right.

Simon Welchman - Director

ATTACHMENT A: Genesis Waste Management Facility Modification 6 (MP 06_0139 MOD 6) – review of response to issues raised in Katestone Report

Katestone comment on Modification 6 AQA	Genesis Response to Submissions	Katestone Response																																								
<u>Worst-case operating scenario:</u> the AQA asserts that a worst-case emissions scenario has been modelled that is based on a 50/50 split of the 2Mtpa licensed capacity between the MPC and the landfill. However, in my opinion this scenario does not represent the worst-case because additional materials from the MPC would be allowed to be landfilled under the condition proposed by the proponent. The AQA has assumed that none of the recyclable materials would be landfilled. As a consequence, emissions of dust associated with hauling and landfilling of waste materials are likely to have been underestimated. The extent of underestimation is difficult to determine without a reliable estimate of the quantity of materials from the MPC that would be landfilled. The AQA estimated that hauling materials to the landfill accounts for 39% of total site emissions of PM₁₀. If 50% of the materials from the MPC were landfilled, the PM₁₀ emission rate from the site would increase by 20%.	RtS page 39: The proposal is to increase the landfill cap to 1M tpa excluding waste generated as a by-product of the recycling processes conducted in the PSE and MPC. In terms of the definition we have adopted to describe the waste streams, the by-product waste from recycling and reuse is not part of the 'direct-to-landfill' waste stream. It is important to separately account for by-products of recycling processes. This is because the purpose of the landfill limit is to influence greater application of recycling and reuse as waste management methods as opposed to 'direct-to-landfill' methods. Including by-products of recycling within a volume-based limit for landfilling undermines that intended outcome and ignores the influence of market forces which already drive waste processing towards more recycling and reuse. From both a business and environmental perspective, recycling and reuse is preferable. It should not be constrained by a landfill limit which, ironically, is meant to promote recycling and reuse. In terms of air quality modelling, the assessment has incorporated incoming material (or waste) quantities as shown below. <table><tr><th>ID</th><th>Material</th><th>Amount (tpa)</th><th>Details</th></tr><tr><td>A</td><td>Total Incoming</td><td>2,000,000</td><td></td></tr><tr><td>B</td><td>Direct haul to landfill</td><td>1,000,000</td><td>50% of A</td></tr><tr><td>C</td><td>Commingled and Segregated material</td><td>1,000,000</td><td>50% of A</td></tr><tr><td>D</td><td>Segregated waste</td><td>200,000</td><td>20% of C</td></tr><tr><td>E</td><td>Commingled waste through MPC</td><td>800,000</td><td>80% of C</td></tr><tr><td>F</td><td>Commingled residual to landfill via chute</td><td>240,000</td><td>30% of E</td></tr><tr><td>G</td><td>Greenwaste shredding</td><td>80,000</td><td>10% of E</td></tr><tr><td>H</td><td>Crushing bricks concrete in Yard</td><td>510,000</td><td>(80% of E) + D)*75%</td></tr><tr><td>I</td><td>Screening sand/soil in Yard</td><td>170,000</td><td>(80% of E) + D)*25%</td></tr></table> These are based on typical operations at the facility (in terms of the mix of waste streams) but calibrated to assume a maximum volume of 2M tpa received at the gate. In summary, it is agreed that the 50/50 split will – on an assumed maximum volume received at the gate of 2M tpa and on an assumed 1M tpa of that waste received being 'direct-to-landfill' waste – result in more than 1M tpa being landfilled from all sources but not more than 1M tpa of direct-to-landfill waste. The alternative to this proposed arrangement is to cease recycling when the landfill limit is reached; send 'direct-to-landfill' waste to alternative landfill facilities; send recyclable waste to other facilities; or a combination of these. Either way, the impacts will be greater because trucks carrying that waste will be forced to travel greater distances, through more suburbs, in search of an appropriate disposal location. If this cost and time burden becomes too great, it may also incentivise illegal dumping locally.	ID	Material	Amount (tpa)	Details	A	Total Incoming	2,000,000		B	Direct haul to landfill	1,000,000	50% of A	C	Commingled and Segregated material	1,000,000	50% of A	D	Segregated waste	200,000	20% of C	E	Commingled waste through MPC	800,000	80% of C	F	Commingled residual to landfill via chute	240,000	30% of E	G	Greenwaste shredding	80,000	10% of E	H	Crushing bricks concrete in Yard	510,000	(80% of E) + D)*75%	I	Screening sand/soil in Yard	170,000	(80% of E) + D)*25%	The RtS is not adequate as it does not demonstrate that a realistic worst-case scenario has been modelled. The RtS explains that the AQA was based on an assumption that 30% of the 0.8 Mtpa of material that is processed by the MPC will also go to landfill. The basis and justification of this assumption is not provided. The modification application seeks to remove any limit on the amount of waste material from the MPC that can be disposed of to the landfill. The proportion of material processed by the MPC that is going to landfill may therefore be higher than the 30% that is the basis of the modelling. It is also assumed that this material will be transported to the landfill by chute. As a consequence of this assumption, the estimated dust emissions are less than if the MPC waste were transported to the landfill by truck. The feasibility of transporting 0.24 Mtpa of waste via the chute has not been established. If this material cannot be transported via the chute (e.g. due to limited chute capacity) and must be transported by truck, the AQA will have underestimated emissions and potential impacts from the proposal. The likelihood and potential consequences for air quality of more than 0.24 Mtpa (i.e. 30%) of material from the MPC being landfilled has not been evaluated. If a greater amount of this material is required to be landfilled, the AQA will have underestimated emissions and potential impacts from the proposal.
ID	Material	Amount (tpa)	Details																																							
A	Total Incoming	2,000,000																																								
B	Direct haul to landfill	1,000,000	50% of A																																							
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Katestone comment on Modification 6 AQA	Genesis Response to Submissions	Katestone Response
<u>Background levels of air pollutants:</u> have been estimated based on data collected by the proponent at the Genesis Facility and by NSW Office of Environment and Heritage (OEH) at St Marys and Prospect. The AQA has not accounted for the influence on air quality of the proposed Hanson Concrete & Asphalt Facility at Lot 1, Kangaroo Avenue, Eastern Creek. Such a facility will emit dust, and consequently, the AQA should consider the potential cumulative impacts of the proposed development in conjunction with the Hanson Facility.	RtS page 40: Cumulative impacts are assessed by combining the contribution from the Modification with the existing ambient air quality environment, described based on baseline monitoring data for the region. The derived baseline is assumed to account for all existing emissions sources in the local airshed, including the Hanson facility. The standard methodology for deriving background air quality is to take into account all existing and reasonably foreseeable local development. The expansion of the Hanson facility was considered a speculative rather than reasonably foreseeable development, and was therefore not modelled for current background air quality purposes.	The RtS is not adequate as it has not considered all reasonably foreseeable developments in the vicinity of the site. Katestone understands that the approval for a new Hanson Facility (to be located immediately adjacent to the site) has been granted. Consequently, it would be normal practice to account for the potential impact of such a facility. The AQA does not adequately assess the potential cumulative impacts of the proposed development in conjunction with the Hanson Facility.
<u>Receptor locations:</u> The existing commercial and industrial receptors, such as Australand, have been identified as discrete points in the dispersion modelling. The discrete points are shown on the contour plots at Appendix 5 of the AQA. These discrete points are not representative of the points of greatest potential impact of the proposed development on those commercial and industrial receptors. The nearest point of Australand is the southwest corner of the Australand building, but the location of the discrete point in the dispersion modelling is on the northern side of the building close to the Western Motorway. In terms of PM₁₀, the degree of underprediction of the maximum 24-hour concentration at receptor R12 (Australand) due to the location of the receptor in the model is more than 28µg/m³, which is 56% of the criterion (50µg/m³). It is likely that predicted maximum 24-hour average ground-level concentrations of PM₁₀ would exceed the criterion at one or more of the existing commercial and industrial receptors. The AQA does not address the potential for these exceedances. The exceedances suggest that the proposed development has an unacceptable risk of causing adverse impacts on human health. Under the Approved Methods for Modelling, if the criteria are predicted to be exceeded "...the dispersion modelling must be revised to include various pollution control strategies until compliance is achieved."	RtS page 41: The points of reference for commercial and industrial receptors are selected based on where exposure to dust may occur, for example building openings, car parks, loading docks etc. The assessment approach is consistent with industry standard.	The RtS is not adequate. It is normal practice to assess the nearest point of an adjoining property. The AQA has likely underestimated the potential impact of the proposal by its selection of receptor locations. The AQA has failed to properly assess the potential impacts of the proposal at the nearest point of potentially affected receptors.

Katestone comment on Modification 6 AQA	Genesis Response to Submissions	Katestone Response
<u>Predictions of dust:</u> The AQA does not provide predictions for ground-level concentrations of dust and odour at the Jacfin site. To address this, I have estimated the concentrations from the contour plots at Appendix 5 of the AQA. The results show a likelihood of exceedance of the 24-hour average and annual average criteria for PM_{2.5} at the Jacfin land and also at other residential and commercial locations in the vicinity of the proposal. This conclusion for the Jacfin land is based on consideration of the predictions at R17 for 24-hour average PM₁₀, because there are no tabulated predictions in the AQA for the Jacfin land. The AQA does not adequately address this potential for exceedances. The exceedances suggest that the proposed development has an unacceptable risk of causing adverse impacts on human health. Under the Approved Methods for Modelling, if the criteria are predicted to be exceeded "...the dispersion modelling must be revised to include various pollution control strategies until compliance is achieved."	RtS page 41: The concentration and dust deposition contours show the predicted levels for all pollutants across all areas around the site and can be reviewed to determine impacts on specific areas of interest. RtS page 39: No residential receptors are predicted to exceed the impact assessment criteria for 24-hour average PM10 and PM2.5. There was a single predicted exceedance of the 24-hour PM2.5 criterion at an adjacent industrial receptor, on a day when background was already elevated, and therefore the risk of additional exceedances was concluded to be low.	The RtS is not adequate. The results of the AQA on the Jacfin land, as inferred from predictions at the nearest discrete receptor (R17), show the potential for exceedance of the 24-hour and annual average criteria for PM_{2.5}. The background annual average concentration of PM_{2.5} exceeds the air quality criterion without the proposed development. In this situation the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (Approved Methods for Modelling) states: "...In some locations, existing ambient air pollutant concentrations may exceed the impact assessment criteria from time to time. In such circumstances, a licensee must demonstrate that no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity and that best management practices will be implemented to minimise emissions of air pollutants as far as is practical." The AQA does not demonstrate that best management practice will be implemented to minimise emissions of PM_{2.5} as far as is practical. See below.
<u>Haul route lengths</u> on unpaved roads that have been assumed in the study do not represent the likely lengths of haulage given the scale of the site and location of activities. The AQA does not provide maps or plans of haul routes to support its assumptions.	RtS page 41: The main impact associated with haul route length is dust generated by truck movements, and this is assumed to be the reason why the haul length on unpaved roads was raised. For dust impacts associated with these matters please refer to the Air Quality section of this document, as the same matters were mentioned in relation to air quality.	The RtS is inadequate. No additional information has been provided in the RtS to support the assumptions relating to haul road lengths. It is therefore not possible to assess whether dust impacts from haulage have been properly characterised.

Katestone comment on Modification 6 AQA	Genesis Response to Submissions	Katestone Response
The <u>silt content</u> assumed in the AQA for paved roads and unpaved roads appear to be unrealistically low and have not been justified. No control measures targeting silt content of paved and unpaved roads have been identified in the AQA.	RtS page 41: No site-specific measurements of silt content or silt loading were available; therefore the adopted values are taken from the literature. The silt content assumed for unpaved roads (6.4%) is the mean value reported for municipal solid waste landfills in the AP42 emission factor documentation for unpaved roads (chapter 13.2.2). Similarly, the silt loading assumed for paved roads within the site (7.4g/m2) is the mean value reported for municipal solid waste landfills in the AP42 emission factor documentation for paved roads (chapter 13.2.1). The silt loading assumed for the site access road (0.6g/m2) is the ubiquitous baseline value reported for public roads with <500 average daily traffic volumes in the AP42 emission factor documentation for paved roads (chapter 13.2.1). Generally, the values selected are expected to be conservative. For example, silt contents measured for unpaved roads at coal mines in NSW are, on average 4.6%, lower than the value we used.	The RtS is adequate.
<u>Emission control efficiency:</u> The AQA assumes that emission controls capable of achieving 70% efficiency on paved roads and 90% on unpaved roads will be applied. These control efficiencies are very high in my experience and have not been adequately justified or demonstrated to be achievable in practice. For control of dust from unpaved roads, the AQA assumes that wind breaks will reduce emissions by 30%; however, dust generation on unpaved roads is not induced by wind but by wheel action on the surface of the road. The 30% control factor not valid.	RtS page 41: All existing mitigation measures are listed in Section 6 of the AQA. These mitigation measures represent best practice dust controls and all reasonable and feasible measures that would be adopted/continued for the Modification. The control efficiencies used are based on values reported in the literature.	The RtS is inadequate and does not demonstrate that the control benefits that were adopted in the AQA are realistic. The AQA does not provide any literature references to support the control factors that have been adopted and the approach that has been used to combine control factors. The AQA does not provide the results of any validation studies that demonstrate that the assumed effectiveness of the combined controls can be achieved in practice, and is therefore unreliable.
<u>Dust deposition rate contour plot:</u> The dust deposition rate contour plot, Figure A5-6 of the AQA, appears to be identical to Figure A5-5 of the AQA (predictions of TSP). The results in Figure A5-6 do not correspond to the tabulated results in the AQA. Therefore, it is likely that Figure A5-6 of the AQA is incorrect and is not representative of the potential impact of the project.	RtS page 41: The TSP contour was inadvertently included in the place holder for dust deposition. The correct dust deposition contour is shown in Figure A-2 of Appendix A to this report.	The RtS is adequate.

<u>Odour assessment:</u> Predicted ground-level concentrations of odour at the Jacfin land are close to, and probably exceed, the criterion for urban areas of 2 ou. Predicted ground-level concentrations of odour exceed 2 ou at each of the commercial and industrial receptors that are identified in the AQA, namely: R12-R17 and also at three additional commercial receptors at the northern end of Grevillia Street. Consequently, the proposed development may cause odour nuisance at commercial and industrial premises in its vicinity. The AQA suggests that a criterion of 7 ou applies to the commercial activities. However, in my opinion, this is an incorrect interpretation. The Approved Methods for Modelling (NSW EPA, 2017), requires an assessment to be made at existing and possible future sensitive receptor¹ locations, which includes places where people are likely to work – such as an office. The Approved Methods for Modelling applies a criterion of 7 ou to a "Single rural residence". Whereas, it applies a criterion of 2 ou to "Urban (>~2000) and/or schools and hospitals". To ensure that the Jacfin and surrounding vacant land may adopt the broadest range of uses, a criterion of 2 ou should be adopted. The AQA contains very limited information in relation to the odour assessment. For example, emission areas and total odour emission rates from activities are not reported. It is therefore difficult to determine the adequacy of the assessment. Additionally, it is difficult to determine the potential consequences of additional materials from the MCP being landfilled. The AQA has not used site-specific measurements of odour. Instead the AQA estimated odour emission rates from the average specific odour emissions rate from four putrescible waste landfills, namely: Whytes Gully, Spring Farm, Woodlawn and Lucas Heights. The adoption of an average rate from the putrescible waste landfills is an arbitrary decision. It is relevant to note that emissions from the four putrescible landfills are quite variable and, consequently, adoption of the average of the four will potentially underestimate the potential impact of the proposal. For example, the peak odour emission rate for intermediate cover² amongst the four putrescible waste landfills is 3 times higher than the average odour emission rate.	RtS page 42: A detailed description of odour emission is provided in Section 6.2 of the AQIA. Modelling predictions for a worst-case odour emissions scenario area presented in Section 7.4.	The RtS is inadequate as it does not present sufficient information to assess the adequacy of the odour assessments. Section 9 of the Approved Methods for Modelling specifies the minimum information requirements for emissions, the following elements have not been provided in the AQA: • <i>The operational parameters of all emission sources, including all operational variability, i.e. location, release type (stack, volume or area) and release parameters (e.g. stack height, stack diameter, exhaust velocity, temperature, emission concentration and rate)</i> • <i>Detailed calculations of pollutant emission rates for each source</i> • <i>Tables showing all release parameters of stack and fugitive sources (e.g. temperature, exit velocity, stack dimensions, and emission concentrations and rates), and all pollutant emission concentrations.</i> The AQA does not include the information detailed above as required by the Approved Methods for Modelling. It is, therefore, not possible to determine whether the odour impacts of the proposed modification have been adequately assessed.
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Katestone comment on Modification 6 AQA	Genesis Response to Submissions	Katestone Response
The AQA provides no plan or data that describes the locations and extents of odour emitting sources associated with the proposal. Such data should be provided in this type of study and its absence means that the adequacy of the assessment cannot be verified. The AQA does not provide input or output files for the dispersion model and meteorological models. Consequently, I cannot check whether the models have been configured in accordance with the assertions made in the AQA. Predicted ground-level concentrations of odour at the Jacfin Land probably exceed the criteria for populated areas of 2OU.	RtS page 42: The 2 OU contour does not extent across the Jacfin property land. Please refer to Figure A5-7 in Appendix 5 'Contour plots' of the Air Quality Impact Assessment Report.	The RtS is inadequate. The AQA has not used site-specific measurements of odour which would provide a much more accurate indication of likely overall odour impacts from the proposed development. Instead the AQA estimated odour emission rates from the average specific odour emissions rate from four putrescible waste landfills, namely: Whytes Gully, Spring Farm, Woodlawn and Lucas Heights. The adoption of an average rate from these putrescible waste landfills is an arbitrary decision. It is relevant to note that emissions from the four putrescible landfills are quite variable and, consequently, adoption of the average of the four will potentially underestimate the potential impact of the proposal. For example, the peak odour emission rate for intermediate cover amongst the four putrescible waste landfills is 3 times higher than the average odour emission rate. If this higher odour emission rate were used rather than the average, the predicted ground-level concentration of odour at the Jacfin Land would exceed the criterion of 2OU.

¹ The Approved Methods for Modelling defines a **sensitive receptor** as: A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area. An air quality impact assessment should also consider the location of known or likely future sensitive receptors.

² Intermediate cover is a layer of cover material that is approximately 0.5 metres thick that is placed over waste at a landfill.

ATTACHMENT B: Genesis Waste Management Facility Modification 6 (MP 06_0139 MOD 6) – review of response to EPA Submissions - Air Quality Assessment

EPA Submission	Genesis Response	Katestone Response
CALMET meteorological file data not validated.	RtS page 22: EPA's letter to DPE dated 15 November 2018 required that the CALMET predicted data at the Prospect meteorological station be compared with the observations at the Prospect meteorological site. To address this comment, CALMET performance is evaluated against statistical benchmarks / ideal scores for a number of statistical tests. It is noted that performance benchmarks for bias and error are not intended as necessarily a pass / fail grading system, rather to put the model's results in context with other models and meteorological data sets. The results of the statistical evaluation are shown in Appendix A to this report (Table A.1). Both wind speed and temperature show high correlation (>0.8) for Pearson's correlation coefficient and index of agreement (IOA). Similarly, the fraction of predictions within a factor of 2 (FAC2) are high for both (<0.8). Wind direction does not meet the benchmark for bias or error, however it achieves a high score for FAC2 (0.8) and achieves moderate correlation and IOA (0.6). The measured wind direction at Prospect displays a dominant north-northwest and southwest, whereas the CALMET predicted wind directions shift slightly to north-northeast and west (Figure A-1 in Appendix A to this report). The slight shift in wind direction is likely a result of the model's treatment of the Prospect Reservoir located to the south, both in terms of the influence the water body and the slightly elevated terrain. Notwithstanding, the model performance is considered to be adequate for assessment, based on meeting the majority of the statistical performance benchmarks evaluated.	RtS is inadequate. Appendix A of the RtS presents the results of a statistical analysis of modelled versus observed wind speed, wind direction and temperature. The RtS provides no explanation of how the statistics were produced. Considering the statistics presented in Appendix A, the meteorological model has not characterised wind direction accurately. The statistical measures: Mean Bias and Mean Gross Error are outside of the benchmarks for desirable model performance. The implications of this have not been discussed in the AQA nor has the AQA conducted a sensitivity analysis to explore the consequences of the poor model performance with respect to wind direction. The meteorological modelling presented by Genesis shows 19.1% of calms at the Genesis site, which is high compared to the 10.3% at Prospect. As a consequence of the high proportion of calms, emissions from the landfill are likely to be underestimated. The implications of this have not been discussed in the AQA nor has the AQA conducted a sensitivity analysis to explore the consequences of the high level of calms.

EPA Submission	Genesis Response	Katestone Response
Ground level PM₁₀ and PM_{2.5} concentrations are significant at nearby industrial receptors. The Applicant should: Detail the current and proposed mitigation measures; Where exceedances of the impact assessment criteria are predicted, the assessment should be revised to include additional pollution control strategies. Consideration needs to be given to the assessment of peak daily landfill operations, as advised in issue 3 [re peak emissions]	RtS page 24: All existing mitigation measures are listed in Section 6 of the AQIA – Appendix C to the Environmental Assessment. These mitigation measures represent best practice dust controls and all reasonable and feasible measures that would be adopted/continued for the Modification. Also as discussed above, the emission scenario does account for peak daily emissions from the concurrent operation of the landfill and MPC. The modelling predictions in the revised AQIA demonstrate that, provided mitigation measures are employed, the Modification would generally comply with impact assessment criteria at adjacent industrial receptors. There was a single predicted exceedance of the 24-hour PM_{2.5} criterion, on a day when background was already elevated, and therefore the risk of additional exceedances was concluded to be low. Notwithstanding, and as provided for in the Environmental Assessment (section 7.3.5), the Applicant commits to relocating their real-time monitoring station to a boundary location adjacent to the neighbouring industrial receptors, such that reactive management measures can be used to minimise the potential for adverse impacts from site operations. It is not possible to account for these reactive measures in the modelling and present revised results to demonstrate their effectiveness. However, the Applicant would review and update the site's Air Quality Management Plan to document suitable reactive measures and the monitoring-based triggers used to initiate these reactive measures, based on a combination of: - meteorological forecasts to predict when the risk of dust emissions may be high (due to adverse weather) and allow procedures and preparatory measures to be implemented; - visual monitoring to provide an effective mechanism for proactive control of dust at source, before it leaves the site; and - real-time air quality monitoring to provide alerts when short-term dust levels increase, to allow management of the location and intensity of activities or increase controls	RtS is inadequate. The RtS has not provided any additional information on current or proposed control measures. The RtS does not specify the reactive measures that will be implemented if elevated levels of PM₁₀ and PM_{2.5} are found to occur, nor does it specify the monitoring thresholds that will be used to trigger reactive measures. The proponent has effectively deferred identifying what controls may be capable of being implemented when an exceedance occurs. There is, therefore, no confidence that the proponent will be ready and able to adequately respond when an exceedance occurs. In Katestone's experience it is possible to account for reactive measures in dispersion modelling. As this has not been done there is no assurance that any reactive measures that are proposed to be implemented will be effective.

31 July 2019

WM Project Number: 17084-B
Our Ref: A17084-B ltr 22102018
Email: adam.hutchings@allens.com.au

Bill McCredie
Allens Linklaters
Corner of Hunter & Phillip Streets
SYDNEY NSW 2000

Dear Bill

**Re: Genesis Waste Management Facility - Modification 6 (MP06_0139 MOD6)
Noise Peer Review on behalf of Jacfin Pty Ltd**

Dial A Dump Industries (EC) Pty Limited (Proponent) operates a materials recovery and landfill facility at Honeycomb Drive, Eastern Creek. The site is operated under Major Project Approval 06_139. The Proponent has lodged an application to modify the approval as follows:

- Increase the direct-to-landfill waste volumes;
- Extend the hours of operation to include night; and
- Substantially revised noise limits.

Jacfin Pty Ltd (Jacfin) made a submission objecting to the modification in October 2018. Wilkinson Murray prepared a noise peer review, which was attached to that submission.

The Proponent has since provided a Response to Submissions Report (RtS Report) dated May 2019 which responds to all submissions made including those made by Jacfin.

Wilkinson Murray was engaged by Allens Linklaters, on behalf of Jacfin Pty Ltd, to review the noise responses in the RtS Report.

The noise review was conducted referencing the following documentation:

- Genesis Waste Management Facility, Eastern Creek, Modification 6 Response to Submissions, EMM, May 2019 (referred to as the RtS Report).
- Noise and Vibration Impact Assessment, Modification 6 Prepared for Dial A Dump Industries Pty Limited, EMM, 13 September 2017 (referred to as new noise assessment);
- Noise and Vibration Impact Assessment, Modification 6 Prepared for Dial A Dump Industries Pty Limited, EMM, 15 August 2018 (referred to as the original noise assessment);
- Next Generation Energy from Waste Facility (SSD 6236) – Noise Impact Assessment, Pacific Environment Limited (referred to as Energy from Waste Facility).

Table 1 presents the issues raised by Wilkinson Murray in its initial peer review, the response provided by the Proponent in its RtS Report and Wilkinson Murray's commentary on the adequacy of the response.

Wilkinson Murray has also reviewed the issues raised by the EPA and DPIE and the responses presented by the Proponent. Table 2 below presents the noise issues raised by the EPA and DPIE, the response provided by the Proponent and Wilkinson Murray's commentary on the adequacy of the response.

The key outstanding issues that have not been adequately resolved by the RtS Report are as follows:

- This RtS Report does not explain why the existing noise limits were put into the Approval and Environment Protection Licence and then accepted by the Proponent, or sufficiently justify why a significant increase in the noise criteria previously determined to be appropriate by the EPA and DPIE is acceptable.
- The Proponent has not explained why noise from approved operations is up to 10dB above the approval limit at Minchinbury.
- New background noise monitoring must be conducted to ensure that the developed noise criteria which underly the applicable noise assessment are contemporary and accurate.
- Consistent with best practice, the existing operational noise model must be validated with current noise measurements.
- A qualitative assessment of low frequency noise should be conducted to ensure that the correct modifying factor has been applied to determine the resultant assessment noise level at the noise sensitive receivers.
- The Proponent should utilise direct measurement of plant and equipment rather than use the EMM database. If the direct measurement of existing plant and equipment are different from the noise levels used in the noise assessment, operational noise predictions could be incorrect, and the noise impacts may have been underestimated.
- Noise predictions should be revised so that lighting plant and maintenance equipment are incorporated in the operational noise predictions.

Table 1 Review of RtS report, Issues Raised by Wilkinson Murray.

Issue Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Response																
1.0 Noise Criteria The current Approval and Environment Protection Licence has the following noise limits: <table><tr><th>Location</th><th>Day – dB(A) (L_{Aeq}(15 minutes))</th><th>Evening dB(A) (L_{Aeq}(15 minutes))</th><th>Morning Shoulder - dB(A) (L_{Aeq}(15 minutes))</th></tr><tr><td>Any receiver</td><td>37</td><td>36</td><td>36</td></tr></table> It is unclear how the original noise limits have been derived from the original noise assessment. The Department of Planning in its Environmental Assessment Report (dated October 2009) recommends lower limits than the Industrial Noise Policy’s project specific noise levels. The criteria proposed in the modification are based on project specific noise levels derived from procedures in the Industrial Noise Policy, primarily background +5dB and are presented below:	Location	Day – dB(A) (L _{Aeq} (15 minutes))	Evening dB(A) (L _{Aeq} (15 minutes))	Morning Shoulder - dB(A) (L _{Aeq} (15 minutes))	Any receiver	37	36	36	RtS Report – page 36 It appears that the current noise limits have been established based on minimum noise criteria as per the INP. Given the relatively high ambient noise levels in the nearby residential areas it is likely that noise emissions from current operations would not be audible. As above, the current noise limits are set well below those levels that would cause disturbance.	The current noise limits are not based on the minimum noise criteria in the INP. If this was the case then the noise criteria would be 35dBA for day, evening and night. This RtS Report does not explain why the noise limits of: <table><tr><th>Location</th><th>Day – dB(A) (L_{Aeq}(15 minutes))</th><th>Evening dB(A) (L_{Aeq}(15 minutes))</th><th>Morning Shoulder - dB(A) (L_{Aeq}(15 minutes))</th></tr><tr><td>Any receiver</td><td>37</td><td>36</td><td>36</td></tr></table> were put into the Approval and Environment Protection Licence and then accepted by the Proponent, or sufficiently justify why a significant increase in the noise criteria previously determined to be appropriate by the EPA and DPIE is acceptable.	Location	Day – dB(A) (L _{Aeq} (15 minutes))	Evening dB(A) (L _{Aeq} (15 minutes))	Morning Shoulder - dB(A) (L _{Aeq} (15 minutes))	Any receiver	37	36	36
Location	Day – dB(A) (L _{Aeq} (15 minutes))	Evening dB(A) (L _{Aeq} (15 minutes))	Morning Shoulder - dB(A) (L _{Aeq} (15 minutes))															
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Any receiver	37	36	36															

Issue Raised in Review of Modification Application					Proponent Response	Wilkinson Murray Response
Location	Day – dB(A) (L _{Aeq} (15 minutes))	Evening – dB(A) (L _{Aeq} (15 minutes))	Night – dB(A) (L _{Aeq} (15 minutes))	Morning Shoulder (L _{Aeq} (15 minutes))		
Minchinbury residential receivers	48	47	44	47		
Erskine Park residential receivers	39	40	37	40		
It is recommended that the Department of Planning & Environment and EPA review the prior reasoning for the lower noise limits and then base their review on that reasoning.						
2.0 Noise Monitoring Background noise levels are an essential part of a noise assessment. Under the NSW Industrial Noise Policy (INP) they are the basis for establishing the intrusive noise criteria. Therefore, it is very important that the correct background noise levels be identified during noise monitoring surveys. The noise assessment is using the same noise data used for the Energy from Waste Facility (SSD 6236) which was conducted in March 2014. It is considered that for a substantial modification, that may result in higher noise criteria, more comprehensive and					RtS Report– page 36 Monitoring was undertaken in March and April 2014. No significant changes have occurred in the area that would be expected to impact ambient noise levels since the noise monitoring was undertaken. Traffic noise may have increased slightly and some increased industrial development in the area may have the effect of increasing ambient noise levels. As such, use of noise levels measured in 2014 to determine intrusive noise goals is considered a conservative approach and suitable for the purpose of this assessment.	The determination of the background noise level is a critical element in a noise assessment as it is used to inform the potential noise impact on the community in the vicinity of the development. The background noise levels are used to develop the criteria and the criteria is then used to regulate the development in the future through the planning approval and the EPA licence. New background noise monitoring must be conducted to ensure that the developed noise criteria which underly the applicable noise assessment are contemporary and accurate. It would be inappropriate for the Modification

Issue Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Response
contemporary noise monitoring should be used to establish the noise criteria. Additionally, the Energy from Waste Facility (SSD 6236) noise assessment monitoring results at Erskine Park were questionable as it was identified as having been affected by extraneous noise in the form of insect and frog noise. It is recommended that contemporaneous noise monitoring be conducted to ensure the developed noise criteria are both robust and appropriate and therefore it would be inappropriate for the modification request to be determined on the outdated data.	RtS Report – page 36 There is no evidence that the background noise data was affected by extraneous noise.	Application to be determined on the basis of outdated data. Wilkinson Murray is concerned that the noise data used to develop the noise criteria is not typical for the area and therefore might result in higher criteria than should actually be applied to this facility. Transport NSW (Construction Noise and Vibration Strategy / Version 4, 2018) typically recommends that background noise monitoring gets re-monitored after 5 years. The data being relied on was measured in March and April 2014 and is outside of this recommended range. The response to this issue is incorrect. The noise assessment has relied on 2014 data, measured by Pacific Environment for the proposed Energy from Waste Facility. The Pacific Environment Noise Report SSD 6236, page 7, states that: <i>"During the period, it was noted that insect and frog calls were prominent during evening and night periods at BG2."</i> EPA typically require in their policy documents (Noise Policy for Industry and Industrial Noise Policy), one week of "valid data" covering the days and times of operation of a proposed

Issue Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Response
		development. Valid data in this context means data that does not contain extraneous noise. Extraneous noise is noise that is from activities that are not typical of the area. Seasonal insect noise is considered extraneous noise. Wilkinson Murray is concerned that the background noise data used to develop the noise criteria is not typical for the area and therefore might result in higher criteria than should actually be applied for this facility. New background noise monitoring should be conducted to ensure that the developed noise criteria are contemporary and accurate.
3.0 Predicted Noise Levels The noise assessment provides noise predictions for the existing operations and the proposed operations. The existing operational noise predictions are well above the current licence/consent conditions. The reason for this breach in the licence/consent conditions have not been explained. In my opinion, the main reasons for such an exceedance is: - the original EIS under predicted the noise impacts; or - the existing operations are above the approved operating throughput.	RtS Report– page 36 It is agreed there is a need to ensure that the approved (ie latent) operational dimensions of the facility – such as a 2Mtpa gate limit for waste received at the site – is not substituted for the existing (ie actual) operational dimensions. The actual operational dimensions, including noise, are however an appropriate input to the modelling if we are to understand the likely future impacts from those operations. The noise characteristics of (say) a crushing plant will not change simply because there has been a change to the volume of waste which can be sent to landfill. The purpose and the activities of the Eastern Creek site remain those of a waste management and processing facility. The use of the site will not change under the proposed modifications. The matters being modified via this application are the hours of operation and the volume	The RtS Report states that it is “appropriate to model approved operations (based on the measurement of noise from current operations)”. This is not in dispute. The issue raised in the review by Wilkinson Murray was: Does the current operations exceed the approved noise criteria in the consent and EPA licence and what are the reasons for this exceedance? This issue has not been addressed in the RtS Report. Additionally, Wilkinson Murray identified that it was proposed that consistent with best practice,

Issue Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Response
Wilkinson Murray considers the reason for the breach of the licence/consent conditions needs to be explained thoroughly and consistent with best practise, the modelling of the existing operations should be validated with current noise measurements.	of waste permitted to be landfilled. There are two main points to consider here. Firstly, the processing of waste, whether landfill or recycling, is what generates noise, not the approved limits for those activities under a development consent, and the extent of that activity is largely driven by external market forces such as the scale, type and location of waste generating activities such as building demolition. Secondly, it is appropriate to model approved operations (based on the measurement of noise from current operations) because there is, subject to market demand, regulatory provision for the actual operations to increase to that limit but it will be activity of the same type. The intention is therefore to consider the 'real world' noise environment, including local topography and surrounding development, and apply that to a theoretical future scenario based on approved limits.	the existing operational noise model should be validated with current noise measurements. The RtS Report has not addressed this issue and the existing operational noise model is therefore considered to be deficient.
4.0 Low Frequency Noise Where a noise source contains certain characteristics, such as dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same noise level. The INP outlines correction factors to be applied to the predicted noise levels at the receiver before comparison with the noise criteria to account for the additional annoyance caused by these modifying factors. For low frequency noise the INP states that a +5dB correction be added to the predicted noise level if the assessed C and A weighted difference over the same time period is greater than 15dB.	RtS Report – page 36 Refer Section 5.1.1 of the NIA (Addendum to this report). Noise sources were examined for the presence of low frequency noise or other characteristics that could cause greater annoyance such as tonality or impulsiveness. Sources typically used at the site did not contain such features and, as such, the application of modifying factors was not considered necessary.	No quantitative assessment was presented in the noise assessment to demonstrate that low frequency noise does not occur at the residential receivers. Therefore, it can not be verified that low frequency noise is not a characteristic of the site. As the facility is already in operation this issue could be easily addressed by conducting noise measurements and reporting the results. The requirement to carry out a low frequency noise assessment is outlined in EPA's Noise Policy for Industry. The RtS Report has not addressed the low frequency noise issue therefore the noise

Issue Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Response
The low frequency correction, which has been found to be an issue for this type of development has not been considered in the Modification 6 noise assessment. It is recommended that an assessment to consider such a modifying factor be undertaken.		assessment could understate the potential noise impacts as a +5dB penalty to the predicted noise level has not been applied.
5.0 Cumulative/ Precinct Plan Noise Goal / Amenity Criteria The noise assessment has conducted a cumulative noise assessment consistent with the Industrial Noise Policy, however has not considered the <i>Environmental Planning Policy No. 59 (SEPP 59) – Central Western Sydney Economic and Employment Area – Employment Lands Precinct Plan (Section 7.8)</i> optimised noise level goals for the Precinct.	RtS Report – page 37 The Eastern Creek Precinct Plan (Stage 3) is noted as a relevant environmental planning instrument in the Environmental Assessment (section 5.3) and it is also considered in the Noise Impact Assessment Report at Section 4.1.3 of that report. The Precinct Plan states (section 7.8 of the Plan): Given the nature of development within the Precinct, noise generation from the site is to be restricted to a reasonable level. Noise is to be contained where possible and not unreasonably impact on the operations or amenity of adjoining or surrounding sites. The Precinct Plan sets optimum noise criteria for separate 'zones' within the precinct. The Genesis facility is in Zone 1. The Zone 1 optimum noise level is 57bBA (day); 47dBA (evening; and 42dBA (night). The Precinct Plan suggests: These goals will provide adequate protection to the noise amenity of residential areas surrounding the Precinct without unduly restricting the operation of development. Importantly, the Precinct Plan stipulates that the development application "must comply with relevant Council and government authority guidelines". The Precinct Plan describes the optimum noise levels generated within Zone 1 because it anticipates that the impact of those noise levels will provide adequate protection for noise amenity at residential (and industrial) receivers. This is not quite the same as the approach adopted by the "government	The Proponent has responded to this issue adequately considering this response and the new noise assessment presented in the Rts Report. It should be noted with regard to the Minchinbury area: 1. The Precinct Plan criterion is 42dBA $L_{Aeq,night,period}$. 2. The predicted noise level from the development is 44dBA $L_{Aeq,15min}$. 3. The $L_{Aeq,night,period}$ level from the development would therefore be 41dBA. (A conversion based on subtracting 3dB from the $L_{Aeq,15min}$ levels to determine $L_{Aeq,night,period}$) 4. The predicted noise level is 1dB below the Precinct Plan criterion. 5. Given the distance to receivers from other potential industrial sites it is unlikely they will provide a significant contribution to overall resultant noise levels at the Minchinbury area to exceed the Precinct Plan criterion.

Issue Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Response
	authority guidelines” which propose noise criteria measured at the residential and industrial receivers, rather than the source of the noise. Although the noise assessment, and the government guidelines on which it is based, are concerned with the measurement of noise at the receiver points (not the source), all of the guiding documents - the Precinct Plan, government guidelines and noise assessment – have the same outcome in mind and are compatible.	

Table 2 Review of RtS report, Noise Issues Raised by EPA and DPIE.

Issues Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Comment
EPA Approval is being sought for 24 hour maintenance (including repairs) of machinery that appears to include crushers, screens and conveyors. In the EPA's experience this is likely to include generation of noise from equipment such as hammers, drills, generators, lighting plant and grinders. However, there is no assessment of this, or explanation of why there is no assessment, particularly in relation to the potential for sleep disturbance.	RtS Report – page 20 Refer to Section 5.4 of revised noise impact assessment report which is provided as an Addendum document to this report. As noted in Section 5.4 of the revised noise impact assessment report noise modelling predicts that L_{Amax} noise levels will satisfy the INP sleep disturbance screening criteria at all residential assessment locations.	Section 5.4 in the noise assessment presents a sleep disturbance assessment and does not adequately consider maximum noise levels. The Proponent has not responded to EPA's submission adequately as it has not included additional noise sources for lighting plant and maintenance equipment in its operational noise predictions ($L_{Aeq,15min}$) therefore the predicted noise levels from the facility at night might be understated.
DPE Provide justification of why EMM database and not direct measurement of existing plant and equipment was used for operational noise sources.	RtS Report – page 36 Most existing plant noise were measured at site. The updated noise and vibration impact assessment report (provided as an Addendum to this report) summarises the operational noise sources and associated sound power levels used in the noise model. The equipment items and quantities are based on the current equipment inventory provided by the Proponent. Sound power levels were based on attended measurements at the site where possible. The sound power levels of plant and equipment that were unable to be measured during the site visit (for example, where the equipment was not operational at the time) were sourced from an extensive EMM database of similar equipment. These types of plant and equipment have been measured numerous times and the appropriate sound power levels of these items are widely recognised and acknowledged in numerous publications. Section 6.1 of the INP also allows for the situation where	Wilkinson Murray has reviewed detailed aerial photography (nearmap) for the site and notes that there are at least 4 large haul trucks and 5 large front end loaders operating on site in July 2019. <i>Haul Truck</i>

Issues Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Comment
	project-related noise source data cannot be sourced from direct measurements stating that noise data could also be sourced, for example, from previous Environmental Impact Statements or manufacturer's data.	 <i>Front End Loader</i> Table 5.1 of the noise assessment presented the following sound power levels used for the noise modelling taken from the EMM database: - Front End Loader 105dBA; and - Haul Truck 105dBA. Typically, large front end loaders and haul trucks would have a sound power level of at least 110dBA. The sound power levels of haul trucks and front end loaders have therefore been substantially underestimated using the EMM database. The Proponent should utilise direct measurement of plant and equipment rather than use the EMM database. Direct measurement of existing plant and equipment reduces the risk of underestimating the equipment sound power levels.

Issues Raised in Review of Modification Application	Proponent Response	Wilkinson Murray Comment
		The Proponent should utilise direct measurement of plant and equipment rather than use the EMM database. If the direct measurement of existing plant and equipment are different from the sound power levels used in the noise assessment the noise assessment will have underestimated the noise impacts of the proposed modification.
EPA Noise and vibration The predicted levels for the approved operations exceed the current noise limits, both those in the project approval (06_0139) and in both of the Environment Protection Licences (EPLs) for the Facility. The daytime limit for noise from landfill and the RRF [resource recovery facilities], at any residence in Minchinbury, is 37dBA in the project approval. However, predicted noise levels at assessment locations 1 to 8, in Minchinbury (Table 5.2) of the NVIA, are from 43dBA under calm conditions and up to 47dBA for noise-enhancing conditions. There does not appear to be an explanation for why noise from approved operations is up to 10dB above the approval limit. The EPA requests DPE to advise whether the NVIA needs to be revised or the Applicant seeks to modify their approval noise limits.	Rts Report – Page 19 An updated Noise and Vibration Impact Assessment report is provided as an Addendum to this report. It is important to note that the existing noise limits specified in the site's project approval and EPLs are below measured ambient noise levels at the nearest assessment locations. Further, during the site's bi-annual attended noise monitoring, the site's contribution is regularly unable to be quantified due to elevated ambient noise levels at the specified monitoring locations. As presented in Section 7.2 of the Modification 6 Environmental Assessment report it is recommended that the site's noise limits be increased, in line with the highest predicted noise levels or PSNLs adopted for this assessment. EMM has established Project Specific Noise Levels (PSNL) in accordance with the INP. Operational levels are not predicted to exceed the PSNL i.e. operational noise levels are not predicted to generate intrusive noise impacts.	The Proponent has not responded to EPA's submission as it does not state why noise from approved operations is up to 10dB above the approval limit for Minchinbury.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

WILKINSON MURRAY

A handwritten signature in black ink, appearing to read 'J Wassermann', written in a cursive style.

John Wassermann

Director

Appendix G

EPA letter (30 August 2019)



EPA Reference: DOC19/744036

Ms Bianca Thornton
Environmental Assessment Officer
Department of Planning & Environment
Bianca.Thornton@planning.nsw.gov.au

Attention - Bianca Thornton

ELECTRONIC MAIL

30 August 2019

Dear Ms Thornton

RE: Genesis Waste Management Facility (MP 06_0139 MOD 6) – Further Comments

I refer to your request received on 31 May 2019 for the NSW Environment Protection Authority (EPA) to provide comments on the submission by Jacfin Pty Ltd dated 2 August 2019 (the Submission) against the Response to Submissions Report for MP 06_0139 MOD 6 (RTS), the proposal for the Genesis Waste facility located at 1 Kangaroo Avenue, Eastern Creek NSW made by Dial-A-Dump (EC) Pty Ltd (Proponent).

The EPA has reviewed the Submission in relation to the RTS and makes the following comments in relation to Noise and Air impacts.

1. Noise

The Submission contained a Noise Peer Review by Wilkinson Murray Pty Limited dated 31 July 2019 (Noise Review). After review of this and a further review of the Noise and Vibration Impact Assessment (NVIA) completed for the proposal, the EPA recommends the following matters be satisfactorily addressed by the Proponent before the EPA provides final recommended noise conditions:

- a) The NVIA does not explain why the predicted noise levels for existing operations significantly exceed the relevant noise limits in the current project approval. The Proponent must clearly explain:
 - i. The reasons for these predicted exceedances;
 - ii. How the modelled activities and plant and equipment items at the premises reflect actual equipment currently operating at the premises; and
 - iii. How the predicted existing results relate to actual noise emissions from existing activities at the premises.
- b) The Proponent should discuss the potential influence that noise from frogs, insects and cicadas noted in Table 3.3 of the NVIA may have had on the background noise monitoring results and consequently the project-specific noise levels derived in Table 4.5 of the NVIA. This discussion should specifically include whether noise monitoring carried out at other times

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of the year during reduced insect and frog activity would yield lower project-specific noise levels for the proposal.

- c) The Proponent should confirm both the modelled quantities and the sound power levels for all items of plant and equipment are appropriate, preferably by direct measurement of existing items operating on site.
- d) The Proponent should assess the potential for low frequency noise impacts at surrounding residential receivers from the proposal and any applicable modifying factor corrections in accordance with Fact Sheet C of the *Noise Policy for Industry 2017*. This assessment should be included in the NVIA for the proposal.

2. Air

The Submission contained a peer review of air quality assessment information for the proposed modification by Katestone dated 2 August 2019 (Katestone Review). The Katestone Review identified some deficiencies in the air quality assessment completed for the project. The EPA recommends the Proponent consider and respond to the issues raised. EPA comments on the issues raised by the Submission are detailed in the table below.

<u>Issue</u>	<u>Where issue raised</u>	<u>EPA comment and/or recommendation</u>
<u>Worst Case Scenario</u>		
The RTS is not adequate as it does not demonstrate that a realistic worst-case scenario has been modelled. The RTS explains that the Air Quality Assessment (AQA) was based on an assumption that 30% of the 0.8 Mtpa of material that is processed by the MPC will also go to landfill. The basis and justification of this assumption is not provided. The modification application seeks to remove any limit on the amount of waste material from the MPC that can be disposed of to the landfill. The proportion of material processed by the MPC that is going to landfill may therefore be higher than the 30% that is the basis of the modelling. It is also assumed that this material will be transported to the landfill by chute. As a consequence of this assumption, the estimated dust emissions are less than if the MPC waste were transported to the landfill by truck. The feasibility of transporting 0.24 Mtpa of waste via the chute has not been established. If this material cannot be transported via the chute (e.g. due to limited chute capacity) and must be transported by truck, the AQA will have underestimated emissions and potential impacts from the proposal. The likelihood and potential consequences for air quality of more than 0.24 Mtpa (i.e. 30%) of material from the MPC being landfilled has not been evaluated. If a greater amount of this material is required to be landfilled, the AQA will have	Katestone Review	The EPA considers that if more than the assumed 30% of the material from the MPC goes to the landfill, then emission estimations may change. The Proponent should consider the provision of further justification for constructed assessment scenarios. DPE could consider a consent condition that limits the amount of material that goes from the MPC to the landfill. If material is transported to landfill by truck rather than chute, then emission estimations may change. The Proponent should consider the provision of further justification for constructed assessment scenarios. DPE could consider a consent conditions that specifies that all material from the MPC must be transferred via the chute.

underestimated emissions and potential impacts from the proposal.		
The Applicant should: • Detail the current and proposed mitigation measures • Where exceedances of the impact assessment criteria are predicted, the assessment should be revised to include additional pollution control strategies • Consideration needs to be given to the assessment of peak daily landfill operation	EPA letter to DPE with Further comments on AQIA dated 15 November 2018 (EPA November Letter) Katestone Review	As previously detailed in EPA November Letter, the assessment of peak emissions does not account for potential peak daily emissions associated with the landfill operations. The EPA recommends the Proponent undertake an assessment accounting for potential peak daily throughput to the landfill.
<u>Background Air Quality</u>		
The RTS is not adequate as it has not considered all reasonably foreseeable developments in the vicinity of the site. Katestone understands that the approval for a new Hanson Facility (to be located immediately adjacent to the site) has been granted. Consequently, it would be normal practice to account for the potential impact of such a facility. The AQA does not adequately assess the potential cumulative impacts of the proposed development in conjunction with the Hanson Facility.	Katestone Review	Emissions from other developments in the area could contribute to potential cumulative impacts. Ultimately this would depend on the nature and scale of other facilities in the area. The Proponent should consider provision of further information to justify omission of other facilities and emission sources in the area.
<u>Receptor locations</u>		
The RTS is not adequate. It is normal practice to assess the nearest point of an adjoining property. The AQA has likely underestimated the potential impact of the proposal by its selection of receptor locations. The AQA has failed to properly assess the potential impacts of the proposal at the nearest point of potentially affected receptors.	Katestone Review	The EPA notes that the: • September 2017 air quality impact assessment included discrete industrial/commercial receptor locations along the northern boundary. • August 2018 air quality impact assessment relocated the discrete industrial/commercial receptor locations to the north, to a point further away from the boundary. The EPA considers that the difference in discrete receptor locations has potential to change the tabulated results at each receptor, however will not change the contour plots which show predictions across the modelling domain. Contour plots contained in the air quality impact assessment show the potential for predicted exceedances of PM₁₀ (24 hour) extending a small distance beyond the boundary of the premises on an incremental basis. The Proponent should consider providing assessment at the boundary of the nearest receptor. The Proponent could provide contour plots both incremental and cumulative to inform predicted ground level concentrations at all locations across the modelling domain.

<u>Predictions of dust</u>		
The RTS is not adequate. The results of the AQA on the Jacfin land, as inferred from predictions at the nearest discrete receptor (R17), show the potential for exceedance of the 24-hour and annual average criteria for PM2.5. The background annual average concentration of PM2.5 exceeds the air quality criterion without the proposed development. In this situation the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (Approved Methods for Modelling) states: "...In some locations, existing ambient air pollutant concentrations may exceed the impact assessment criteria from time to time. In such circumstances, a licensee must demonstrate that no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity and that best management practices will be implemented to minimise emissions of air pollutants as far as is practical." The AQA does not demonstrate that best management practice will be implemented to minimise emissions of PM2.5 as far as is practical See below.	Katestone Review	The EPA notes that the August 2018 air quality impact assessment predicted the potential for exceedances beyond the site boundary. The EPA previously advised that the Proponent assess peak daily emissions estimated from proposed peak daily throughput and where necessary consider additional mitigation measures. Additionally, it would be useful to understand if proposed peak daily ground level concentrations are likely to significantly change from current operations. As such, the Proponent should consider provision of information on the potential for change in predicted peak daily impacts from current approved operations.
<u>Haul road lengths</u>		
The RTS is inadequate. No additional information has been provided in the RTS to support the assumptions relating to haul road lengths. It is therefore not possible to assess whether dust impacts from haulage have been properly characterised.	Katestone Review	Proponent should consider the provision of clarification on the actual haul road length.
<u>Emission Control Efficiency</u>		
The RTS is inadequate and does not demonstrate that the control benefits that were adopted in the AQA are realistic The AQA does not provide any literature references to support the control factors that have been adopted and the approach that has been used to combine control factors. The AQA does not provide the results of any validation studies that demonstrate that the assumed effectiveness of the combined controls can be achieved in practice and is therefore unreliable	Katestone Review	The Proponent should consider provision of justification for the control factors adopted within their assessment particularly for the assumed 90% control efficiency for haul road emissions. Additionally, as described above, the Proponent should assess potential peak daily throughputs. Depending on the outcomes of peak daily throughputs, the Proponent could give further consideration to the proposed mitigation measures.
<u>Odour assessment</u>		
The RTS is inadequate as it does not present sufficient information to assess the adequacy of the odour assessments Section 9 of the Approved Methods for Modelling specifies the minimum information requirements for emissions, the following elements have not been provided in the AQA: <i>The operational parameters of all emission sources, including all operational variability, i.e. location, release type (stack, volume or area) and release parameters (e.g. stack height, stack diameter, exhaust</i>	Katestone Review	The EPA does not consider odour as a key issue of the proposal on the basis that: - Total gate tonnage received at the facility is not proposed to increase from current approval; - The type of waste received at the facility is not proposed to change from current approval - The consent for the site limits the receipt and landfilling to non-putrescible waste. As

<i>velocity, temperature, emission concentration and rate)</i> • <i>Detailed calculations of pollutant emission rates for each source</i> • <i>Tables showing all release parameters of stack and fugitive sources (e.g. temperature, exit velocity, stack dimensions, and emission concentrations and rates), and all pollutant emission concentrations.</i> The AQA does not include the information detailed above as required by the Approved Methods for Modelling. It is, therefore, not possible to determine whether the odour impacts of the proposed modification have been adequately assessed.		such the risk of significant odour emissions is considered low. • The existing Environment Protection Licence for the premises contains a requirement not to cause or permit the emission of offensive odour.
The RTS is inadequate. The AQA has not used site-specific measurements of odour which would provide a much more accurate indication of likely overall odour impacts from the proposed development. Instead the AQA estimated odour emission rates from the average specific odour emissions rate from four putrescible waste landfills, namely: Whytes Gully, Spring Farm, Woodlawn and Lucas Heights. The adoption of an average rate from these putrescible waste landfills is an arbitrary decision. It is relevant to note that emissions from the four putrescible landfills are quite variable and, consequently, adoption of the average of the four will potentially underestimate the potential impact of the proposal. For example, the peak odour emission rate for intermediate cover amongst the four putrescible waste landfills is 3 times higher than the average odour emission rate. If this higher odour emission rate were used rather than the average, the predicted ground-level concentration of odour at the Jacfin Land would exceed the criterion of 2OU.	Katestone Review	As above.
<u>CALMET meteorological data</u>		
RTS is inadequate Appendix A of the RTS presents the results of a statistical analysis of modelled versus observed wind speed, wind direction and temperature. The RTS provides no explanation of how the statistics were produced. Considering the statistics presented in Appendix A, the meteorological model has not characterised wind direction accurately. The statistical measures: Mean Bias and Mean Gross Error are outside of the benchmarks for desirable model performance. The implications of this have not been discussed in the AQA nor has the AQA conducted a sensitivity analysis to explore the consequences of the poor model performance with respect to wind direction. The meteorological modelling presented by	Katestone Review	The Proponent should consider a sensitivity analysis of wind direction. The Proponent should consider providing further information on the meteorological data utilised for emission estimations and assessing if differences in meteorological data sets has implications on assessed emissions.

Genesis shows 19.1% of calms at the Genesis site, which is high compared to the 10.3% at Prospect. As a consequence of the high proportion of calms, emissions from the landfill are likely to be underestimated. The implications of this have not been discussed in the AQA nor has the AQA conducted a sensitivity analysis to explore the consequences of the high level of calms.		
<u>Mitigation measures and assessment of peak daily emissions</u>		
RTS is inadequate. The RTS has not provided any additional information on current or proposed control measures. The RTS does not specify the reactive measures that will be implemented if elevated levels of PM10 and PM2.5 are found to occur, nor does it specify the monitoring thresholds that will be used to trigger reactive measures. The Proponent has effectively deferred identifying what controls may be capable of being implemented when an exceedance occurs. There is, therefore, no confidence that the Proponent will be ready and able to adequately respond when an exceedance occurs. In Katestone's experience it is possible to account for reactive measures in dispersion modelling. As this has not been done there is no assurance that any reactive measures that are proposed to be implemented will be effective.	Katestone Review	Consideration should be given to assessment of peak daily emissions from increased throughput to the landfill and depending on assessment outcomes the Proponent provides, further detail on the reactive management measures that would be implemented.

If you have any further questions regarding this matter, please contact Carla Thomas on (02) 9995 5302.

Yours sincerely



LARA BARRINGTON
Acting Unit Head Waste Compliance
Environment Protection Authority

Appendix H

Blacktown City Council letter (12 September 2019)



Your ref: 06_0139 MOD 6
File no: MC-06-1449

Mr Chris Ritchie
Industry Assessments
NSW Department of Planning & Environment
GPO Box 39
SYDNEY NSW 2001

12 September 2019

Attention: Bianca Thornton

Dear Ms Thornton

Proposed modifications to Major Project 06_0139 for the Genesis Xero Waste Facility at Eastern Creek

I refer to your correspondence dated 31 May 2019 regarding the proponent's response to submissions for 06_0139 MOD 6, requesting that Council provide comments on the latest version of these proposed modifications to the Genesis Xero Waste Facility.

Having reviewed the additional information, we do not object in principle to the proposed modification as it provides the opportunity for the landfill component of the project to be completed in a shorter timeframe and for improved flexibility to the daily operation of the facility.

However, we do strongly object to the proposed extended hours of operation beyond the day and evening periods as set out in the NSW Industrial Noise Policy. We consider that it is appropriate that all noise-generating activities take place outside of the night-time sleep disturbance period of 10 pm to 7 am.

In particular, the landfill truck movements should be limited to 7 am to 9 pm daily. This provides a 1 hour allowance for truck movements to be completed by 10pm.

The residential amenity of properties in the general vicinity is required to be protected, with particular regard to the Minchinbury residential area.

Environmental health condition

We request that the following condition is imposed in relation to the operational phase the subject of the proposed modification application:

A post commissioning report shall be prepared by an acoustic consultant with suitable technical qualifications and experience, consistent with the technical eligibility criteria for membership to the Association of Australian Acoustical Consultants (AAAC) or the Australian Acoustical Society (AAS). The report is to be prepared within 3 – 6 months of the proposed development operating during extended hours of operation to validate the findings of the acoustic reports

Connect - Create - Celebrate

Council Chambers - 62 Flushcombe Road - Blacktown NSW 2148
Telephone: (02) 9839 6000 - DX 8117 Blacktown
Email: council@blacktown.nsw.gov.au - Website: www.blacktown.nsw.gov.au
All correspondence to: The General Manager - PO Box 63 - Blacktown NSW 2148

submitted in support of modification application MP 06_0139 MOD 6. The report is to be submitted to Council for review.

If you would like to discuss this matter further, please contact our Manager Development Assessment, Judith Portelli, on 9839 6228.

Yours faithfully

A handwritten signature in blue ink, appearing to read 'Glennys James', is written over the typed name.

Glennys James PSM
Assistant Chief Executive Officer
Director Planning and Development

Appendix I

Bingo letter (26 September 2019)

26 September 2019

NSW Department of Planning, Industry and Environment
Ms Bianca Thornton
Environmental Assessment Officer
320 Pitt Street
Sydney NSW

Dear Bianca

RE: Genesis Waste Management Facility – Modification 6 (MP 06_0139 Mod 6)

Bingo Industries (Bingo) has reviewed the letter submitted to the Department of Planning, Industry and Environment (DPIE) on 30 August 2019 by the Environment Protection Authority (EPA) in relation to a submission made by Jacfin Pty Ltd dated 2 August 2019 regarding the Response to Submissions report submitted by the Proponent.

Bingo has prepared a detailed response to the issues raised by the EPA, as well as other issues raised by Jacfin Pty Ltd. (Attachment A)

In addition, following feedback received from DPIE at a meeting held on Monday 9 September, Bingo engaged EMM to carry out further noise assessment and modelling on site (as suggested by DPIE). The results of this modelling are included in the Supplementary Noise Modelling Report attached as an appendix to our response.

We believe that we have been conservative in our modelling and trust that the attached response adequately addresses the issues raised by the EPA and DPIE. If you have any further queries in relation to our response, please do not hesitate to contact me.

Kind Regards



David Taylor
General Manager, Property & Infrastructure
0427 051 109

Attachments

Attachment A - Eastern Creek Mod 6_Response to EPA letter of 30 Aug 2019_FINAL.pdf

Appendix J

Issues table and EMM analysis (23 September 2019)

Attachment A

Genesis Waste Management Facility Eastern Creek – MP 06_0139 Mod 6

Responses to EPA Letter dated 30 August 2019

EPA	Proponent Response
NOISE	
a) The NVIA does not explain why the predicted noise levels for existing operations significantly exceed the relevant noise limits in the current project approval. The Proponent must clearly explain: i. The reasons for these predicted exceedances;	This matter relates to the issue of pragmatic noise limits that adequately account for ambient noise levels. There are three factors in considering the issue of exceedance - the limit set, the ambient noise levels and the extent of the exceedance. If the extent of the exceedance is greater than the set limit but similar to or less than the background noise level, there cannot be said to have been an impact by intrusive noise. The core concern of all parties should therefore be 'has there been an impact? rather than 'has there been an exceedance?' Regardless of previous limits, the noise impact assessment has shown that current noise emission levels are predicted to satisfy the predicted site noise levels (PSNLs). Hence, current emissions are not considered to impact the local area according to the EPA's noise policies. It is possible that previous noise levels were underpredicted. As far as we understand, all compliance measurements have confirmed that site noise is inaudible at residential locations. This is not surprising given the ambient noise levels in the area. Further, during the site's bi-annual attended noise monitoring, the site's contribution is regularly unable to be quantified due to elevated ambient noise levels at the specified monitoring locations. The focus of any genuine environmental assessment should be on actual impacts rather than nominal noise limits. The test of an impact is whether it is intrusive above ambient noise levels rather than whether it exceeds an 'approved limit'. An approved noise limit, if it is to function as a

EPA	Proponent Response
	useful regulatory measure, needs to be calibrated to ambient noise levels so that it controls actual impacts. In this case, we are seeking to have that calibration applied in the interests of all parties. In summary, operational noise levels associated with the Proposal are not predicted to exceed the PSNL i.e. operational noise levels are not predicted to generate intrusive noise impacts. This supports the need for increasing the sites noise limits as presents in Section 7.2 of the Modification 6 Environmental Assessment Report.
ii. How the modelled activities and plant and equipment items at the premises reflect actual equipment currently operating at the premises; and	The quantities of plant for existing and proposed operations are as shown in Table 5.1 of the EMM Noise Impact Assessment report, presented as an addendum to the Modification 6 Environmental Assessment Report. The NIA summarises the operational noise sources and associated sound power levels used in the noise model. The equipment items and quantities are based on the current equipment inventory provided by the Proponent. Sound power levels were based on attended measurements at the site where possible. The sound power levels of plant and equipment that were unable to be measured during the site visit were sourced from an extensive EMM database of similar equipment. It is acknowledged that at times in 2019 during construction activities at the site, additional construction plant was used. However, this is not part of normal operations and therefore not included within the NIA modelling for Modification 6.
iii. How the predicted existing results relate to actual noise emissions from existing activities at the premises.	The modelling could not be validated with current noise measurements obtained through compliance monitoring since the monitoring confirmed site was inaudible and hence site contribution at residences could not be quantified by monitoring. The next best practice approach was adopted being to use measured plant data for the main items used at site as input to the model. This is common and accepted practice for industrial noise assessment for existing operations. Section 6.1 of the INP also allows for the situation where project related noise source data cannot be sourced from direct measurements stating that noise data could also be sourced, for example, from previous Environmental Impact Statements or manufacturer's data.

EPA	Proponent Response
b) The Proponent should discuss the potential influence that noise from frogs, insects and cicadas noted in Table 3.3 of the NVIA may have had on the background noise monitoring results and consequently the project-specific noise levels derived in Table 4.5 of the NVIA. This discussion should specifically include whether noise monitoring carried out at other times of the year during reduced insect and frog activity would yield lower project-specific noise levels for the proposal	The only reference to insect and frog noise being dominant in the sampled data (Table 3.3 of EMM's NIA) is for one night-time attended reading at BG2 and hence this possibly applies for assessment locations 9 to 11, and only at night. The development of the RBL is based on the L90 noise statistical metric which means a noise source needs to be present for 90% of the night period to influence the final level. Based on a review of the 2014 baseline monitoring charts at BG2 (Refer to Pacific Environment Limited NIA report of 21 March 2015), we are of the view that the final RBL at night was not materially impacted by insect noises or similar. The daily noise monitoring charts for BG2 show large variations between the Leq and L90 metric through the night on a number of days, with the L90 being at or above 40dB on such days. Of the 10 nights sampled in 2014, at least five nights exhibited material differences between the Leq and L90 metric, whilst on other nights these metrics are closer together in value. The ABLs from which the final RBL is determined ranged between 33 to 37 dB, with a final RBL of 35dB determined. For these reasons we see no technical evidence to alter the RBL value derived in accordance with the EPA policy relevant at the time (INP). Whilst the adopted night-time criterion for these assessment locations is 40dB LAeq,15minute, the EMM NIA at Table 5.2 shows predicted noise levels of no more than 37dB at night. It is expected that final noise limits in an EPL or similar (consent) would adopt the predicted value of 37dB. If the RBL was in question, the only other limit that could be applied is the NPfl minimum of 35dB for these locations at night. We are therefore possibly deliberating over a difference of 2dB in a noise limit which, for an existing operation, is negligible in noise terms as strictly defined by EPA and DPIE policies (eg a difference of 2dB is not discernible in the environment).

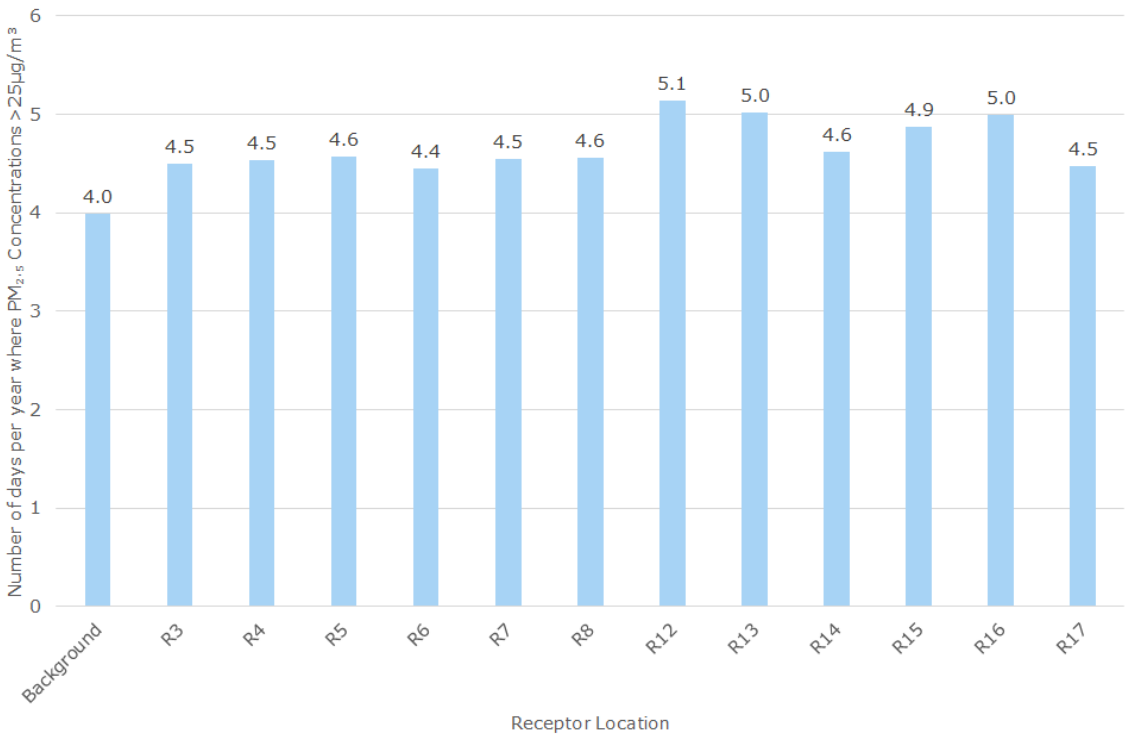
EPA	Proponent Response
	There was some clarification sought regarding whether these insect noises may be extraneous noises for the purpose of modelling. Extraneous noise is defined and explained in the Noise Policy for Industry. The definition is "Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous". Elsewhere in the Policy, the barking of a dog is provided as an example of extraneous noise. It is possible that insects and frogs are typical of the local ambient noise environment for residences to the west of the site as these are adjacent to urban bushland, and such noises are also unlikely to genuinely fit within the definition of extraneous noise alongside worked examples such as concerts and sporting events. EMM has completed additional baseline noise monitoring during August/September 2019 (ie a different season than the 2014 data relied upon to date) and found RBLs of comparable value. The 2019 data has been used to revise the RBL and corresponding noise criteria as shown in the attached report (EMM 2019). Importantly, the final PSNLs are comparable to those adopted in the NIA.
c) The Proponent should confirm both the modelled quantities and the sound power levels for all items of plant and equipment are appropriate, preferably by direct measurement of existing items operating on site.	The model includes actual sound power levels of equipment measured at the site as described in the EMM NIA Table 5.1. This includes the main equipment being the MPC building, crusher, screen, stacker and excavator. Other modelled mobile plant is typical of similar equipment at other operations. The quantities of plant for existing and proposed operations are as shown in Table 5.1. Refer to the attached report at Appendix A for updated onsite plant noise measurements (EMM 2019). The total site noise emission is unchanged from previous data. Hence predicted offsite noise levels presented previously remain representative.

EPA	Proponent Response
d) The Proponent should assess the potential for low frequency noise impacts at surrounding residential receivers from the proposal and any applicable modifying factor corrections in accordance with Fact Sheet C of the <i>Noise Policy for Industry 2017</i>. This assessment should be included in the NVIA for the proposal.	The attached report at Appendix A provides an updated assessment of low frequency noise in accordance with the NPfl and predicted noise levels demonstrate that criteria is satisfied. Furthermore, EMM's observations during recent logger deployment and retrieval to residential areas of Minchinbury and Erskine Park confirms site noise levels are not audible and hence low frequency noise is unlikely to be an additional nuisance implying the approach herein is highly conservative.
AIR QUALITY	
The EPA considers that if more than the assumed 30% of the material from the MPC goes to the landfill, then emission estimations may change. The Proponent should consider the provision of further justification for constructed assessment scenarios. DPE could consider a consent condition that limits the amount of material that goes from the MPC to the landfill. If material is transported to landfill by truck rather than chute, then emission estimations may change. The Proponent should consider the provision of further justification for constructed assessment scenarios. DPE could consider a consent conditions that specifies that all material from the MPC must be transferred via the chute	The imposition of a volume limit on MPC residual waste sent to landfill is a direct constraint on recycling effort. The waste received at the MPC is mixed recyclable waste and with the use of current technologies and sorting methods the recovery rate is considered industry leading. There is nevertheless, invariably a small amount of material received at the MPC which is not suitable for recycling or reuse. This by-product of the MPC processing cannot be stockpiled in the MPC or elsewhere on site because that arrangement would impede operations. The only option for the MPC by-product waste is disposal to landfill. The assumption of 30% chute waste for modelling is based on how the MPC currently operates. As there is no intention to change the way the site operates in terms of total throughput, types of wastes received and processing method through the MPC, there is no reason to assume this would change. The site currently operates with a residual of 20% or approximately 0.25 Mtpa, which confirms that the chute capacity can handle 0.24 Mtpa (the modelled scenario assumption of 30% of 0.8Mtpa). In the event of a shutdown of the MPC, for example during an extended period of unplanned maintenance or equipment failure, there would be a requirement to transport 100% of the residual material from the MPC directly to the landfill via haul trucks. Such events are considered to be unusual operating conditions and would only be short-term in duration. Consistent with proposed

EPA	Proponent Response
	emission management practices for routine operations at the site, particulate matter concentrations at site boundary would be recorded in real-time and compared against site-specific trigger action levels. Should the trigger action levels be reached or exceeded at any time during routine or upset operating conditions, appropriate reactive management measures would be implemented in accordance with the site air quality management plan. The imposition of a condition that requires all material from the MPC to be transferred to the landfill via the chute is not practical, as there are non-recyclable materials received at the MPC in the mixed waste streams (such as tyres, mattresses etc) which cannot be processed by the existing MPC recycling plant and require direct transport from the MPC to the landfill. Reducing waste generation and keeping materials circulating within the economy are priorities for NSW. Two of the core objectives of the NSW Waste Avoidance and Resource Recovery Strategy (2014-2021) are: • to increase recycling to 70% for commercial and industrial waste and 80% for construction and demolition waste; and • divert more waste from landfill. The imposition of a volume limit for the disposal of MPC by-product is essentially a volume limit on the operation of the MPC, which ultimately delivers the Government objectives outlined in the NSW WARR Strategy for creating a circular economy through reducing waste generation, diverting waste from landfill and recycling more materials.
As previously detailed in EPA November Letter, the assessment of peak emissions does not account for potential peak daily emissions associated with the landfill operations. The EPA recommends the Proponent undertake an assessment accounting for potential peak daily throughput to the landfill.	To account for a theoretical worst-case day in the MPC, daily emissions from the MPC (based on 1 Mtpa throughput) are increased by approximately 30%. The concurrent modelled scenario of 1 Mtpa to landfill can also be considered a theoretical worst-case landfilling day, as it represents between 1.25 and 2.5 times the amount of material landfilled on typical day (based on how the site currently and will continue to operate). Thus, the modelled scenario provides a worst-case assessment for peak day operations for both MPC and landfill.

EPA	Proponent Response
Emissions from other developments in the area could contribute to potential cumulative impacts. Ultimately this would depend on the nature and scale of other facilities in the area. The Proponent should consider provision of further information to justify omission of other facilities and emission sources in the area.	While there may be some small contribution to local dust levels from other developments, equally, there will be other sources local to the Prospect monitoring station that are not present at the site. As presented in Table 5-1 of the Ramboll AQIA, the Prospect monitoring station records higher PM₁₀ concentrations than both the local monitoring station operated by the Facility and the second closest monitoring station at St Marys. This forms the basis for our assumption that the existing background is considered sufficiently conservative to account for existing sources of emissions in the local area.
The EPA notes that the: • September 2017 air quality impact assessment included discrete industrial/commercial receptor locations along the northern boundary. • August 2018 air quality impact assessment relocated the discrete industrial/commercial receptor locations to the north, to a point further away from the boundary. The EPA considers that the difference in discrete receptor locations has potential to change the tabulated results at each receptor, however, will not change the contour plots which show predictions across the modelling domain. Contour plots contained in the air quality impact assessment show the potential for predicted exceedances of PM₁₀ (24 hour) extending a small distance beyond the boundary of the premises on an incremental basis. The Proponent should consider providing assessment at the boundary of the nearest receptor. The Proponent could provide contour plots both	When assessing residential sensitive locations in air quality assessment, it is standard and accepted practice in NSW to select a dwelling as the point of assessment, not the nearest point on the adjoining property boundary. Therefore, the selection of points of reference for commercial and industrial receptors based on where exposure to dust may occur is considered appropriate and consistent with air quality assessments completed in NSW. It is noted that it is not possible to provide contour plots for cumulative 24-hour average ground level concentrations across large modelling grids, as the modelling prediction for each grid point can be a different day and therefore the daily background for each grid point is not constant.

EPA	Proponent Response
incremental and cumulative to inform predicted ground level concentrations at all locations across the modelling domain.	
The EPA notes that the August 2018 air quality impact assessment predicted the potential for exceedances beyond the site boundary. The EPA previously advised that the Proponent assess peak daily emissions estimated from proposed peak daily throughput and where necessary consider additional mitigation measures. Additionally, it would be useful to understand if proposed peak daily ground level concentrations are likely to significantly change from current operations. As such, the Proponent should consider provision of information on the potential for change in predicted peak daily impacts from current approved operations.	The AQIA presented a statistical analysis of the likelihood of compliance with the impact assessment criterion and found that for both residential and commercial receptors, risk of additional exceedances of the 24-hour PM_{2.5} impact assessment criterion is low. Figure 1 below shows that four exceedances already occur due to background while up to one additional exceedance may occur from the Proposal, as a worst-case. It is noted that the existing Air Quality Management Plan (AQMP) for the site will be reviewed and updated by the Applicant and will include proactive and reactive management strategies to control potential exceedances, including: • meteorological forecasts to predict when the risk of dust emissions may be high (due to adverse weather) and allow procedures and preparatory measures to be implemented; • visual monitoring to provide an effective mechanism for proactive control of dust at source, before it leaves the site; and • real-time boundary monitoring to provide alerts when short-term dust levels increase, to allow management of the location and intensity of activities or increase controls. While the AQIA didn't explicitly model impacts from current approved operations, it is not expected that the Proposal would significantly change off-site air quality impacts. The estimated dust emissions from the site are correlated to the volume of material handled / processed. As the total volume of material does not change for the Proposal, the total dust emissions are not expected to change significantly, and the overall footprint of impact is expected to be comparable for approved and proposed operations. It is acknowledged that there would be changes to the allocation of total dust emissions to specific source locations (for example more hauling into the pit for the 1 Mtpa landfill scenario), which may change ground level concentrations at some locations, however it is also noted that this modelling scenario is theoretical and represents significantly more material that would be landfilled on a typical day.

EPA	Proponent Response																												
	 <table border="1"> <thead> <tr> <th>Receptor Location</th> <th>Number of days per year where $PM_{2.5}$ Concentrations $> 25 \mu g/m^3$</th> </tr> </thead> <tbody> <tr><td>Background</td><td>4.0</td></tr> <tr><td>R3</td><td>4.5</td></tr> <tr><td>R4</td><td>4.5</td></tr> <tr><td>R5</td><td>4.6</td></tr> <tr><td>R6</td><td>4.4</td></tr> <tr><td>R7</td><td>4.5</td></tr> <tr><td>R8</td><td>4.6</td></tr> <tr><td>R12</td><td>5.1</td></tr> <tr><td>R13</td><td>5.0</td></tr> <tr><td>R14</td><td>4.6</td></tr> <tr><td>R15</td><td>4.9</td></tr> <tr><td>R16</td><td>5.0</td></tr> <tr><td>R17</td><td>4.5</td></tr> </tbody> </table> Figure 1: Number of days where cumulative 24-hour average $PM_{2.5}$ concentration are above criteria	Receptor Location	Number of days per year where $PM_{2.5}$ Concentrations $> 25 \mu g/m^3$	Background	4.0	R3	4.5	R4	4.5	R5	4.6	R6	4.4	R7	4.5	R8	4.6	R12	5.1	R13	5.0	R14	4.6	R15	4.9	R16	5.0	R17	4.5
Receptor Location	Number of days per year where $PM_{2.5}$ Concentrations $> 25 \mu g/m^3$																												
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R8	4.6																												
R12	5.1																												
R13	5.0																												
R14	4.6																												
R15	4.9																												
R16	5.0																												
R17	4.5																												
Proponent should consider the provision of clarification on the actual haul road length.	Appendix 5 of the EMM AQIA provides details on the emission inventory, including haul road lengths and how the assumptions were derived. For example, a return haul distance of 2.1 km is assumed for 'site entrance to weighbridge/MPC' and a return haul distance of 2.0 km for 'unsealed haulage to landfill' (total 4.1 km return trip). Figure 2 below shows a Google Earth image with a measured one-way haul length from entrance to pit bottom of 2.05km.																												

EPA	Proponent Response
	 Figure 2: Haul road length measured from Google Earth
The Proponent should consider provision of justification for the control factors adopted within their assessment particularly for the assumed 90% control efficiency for haul road emissions. Additionally, as described above, the Proponent should assess potential peak daily throughputs.	The adopted controls for haulage (90% - for in pit haulage only) are based on a combination of: • 75% for watering; • 44% for vehicle speed reduction; and • 30% for wind breaks.

EPA	Proponent Response
Depending on the outcomes of peak daily throughputs, the Proponent could give further consideration to the proposed mitigation measures.	The National Pollutant Inventory (NPI) Emission Estimation Technique for Mining states that 75% control efficiency is achievable with Level 2 watering (>2 litres/m²/h) while the WRAP Fugitive Dust Handbook (Countess Environment, 2006¹) specifies that an emission reduction of 44% can be achieved by limiting vehicle travel speed on unpaved roads to 40km/hr, relative to 70km/hr. While wind breaks are not typically applied to control emissions from hauling, it is expected that the northern bund wall and pit shell provide a significant amount of sheltering for all emission sources. It is also noted that a recently completed ACARP project² found that watering alone can achieve control efficiencies of between 85% and 95% and supported elsewhere in the literature (SKM, 2005³; Buonicore and Davis, 1993⁴) which state that controls of 90% and 95% can be achieved through watering alone. It is acknowledged that the adopted controls and the control efficiencies assumed in the AQIA are required for the Project to comply with impact assessment criteria. Commitment will be made by the site to ensure that the controls are implemented and demonstrated to achieve the assumed levels of control. Further details on how the site will demonstrate that these controls are achieved will be outlined in updates to the existing AQMP (ie through key performance indicators and monitoring).
The EPA does not consider odour as a key issue of the proposal on the basis that: • Total gate tonnage received at the facility is not proposed to increase from current approval;	Noted and agreed on basis that the site is not licensed to accept municipal solid waste The odour emission used in the modelling for the active tipping face are approximately 2 times higher than site specific odour monitoring conducted on the active tipping face in 2013. As noted in

¹ Countess Environmental (2006). Wrap Fugitive Dust Handbook.

² Cox, J and Laing, G. (2014). Mobile Sampling of Dust Emissions from Unsealed Roads. ACARP Project C20023 – Stage 2. Pacific Environment Final Report. 20 June 2014

³ Sinclair Knight Merz (2005). Improvement of NPI Fugitive Particulate Matter Emission Estimation Techniques May 2005” SKM RFQ NO. 0027/2004

⁴ Buonicore and Davis (1992). Air Pollution Engineering Manual, Air and Waste Management Association. Edited by Anthony J. Buonicore and Wayne T. Davis

EPA	Proponent Response
• The type of waste received at the facility is not proposed to change from current approval • The consent for the site limits the receipt and landfilling to non-putrescible waste. As such the risk of significant odour emissions is considered low. • The existing Environment Protection Licence for the premises contains a requirement not to cause or permit the emission of offensive odour.	the report, the use of odour emission rates from MSW landfills is highly conservative for this site, as it does not accept MSW.
The Proponent should consider a sensitivity analysis of wind direction. The Proponent should consider providing further information on the meteorological data utilised for emission estimations and assessing if differences in meteorological data sets has implications on assessed emissions.	There are no additional observation sites that could be used to change or enhance the model performance. All available observation sites have either been included for data assimilation or evaluation sites. Modelling has been completed in accordance with the NSW EPA's "Approved Methods for modelling and assessment of air pollutants in NSW" and the evaluation of model performance indicates that the derived wind field provides a suitable representation of local meteorology. In terms of wind direction, the CALMET wind roses for the site displays a similar pattern to the closest observation at Prospect, with winds recorded from most directions and a slightly higher frequency of occurrence from the south west quadrant at both sites. In terms of wind speed, annual average winds are comparable (1.5 m/s and 1.8 m/s) while the percentage occurrence of calm winds is higher onsite (19%) compared to Prospect (10%). While the higher % of calm/lower winds at the site may marginally underestimate emissions from wind erosion sources at the landfill (if compared to emissions using a dataset with higher wind speeds), this also means that the lower wind speeds would result in poorer dispersion conditions and therefore over-estimate ground level concentrations relative to a dataset with higher wind speeds. It is noted that a statistical evaluation for wind speed shows good agreement, which suggests that the modelled % calms conditions at the site are appropriate and therefore would not result in an underestimation of wind generated emissions for the landfill.

EPA	Proponent Response
Consideration should be given to assessment of peak daily emissions from increased throughput to the landfill and depending on assessment outcomes the Proponent provides, further detail on the reactive management measures that would be implemented.	An updated AQMP will be a requirement of the approval. This will include proactive and reactive management strategies, key performance indicators that are consistent with the objective of preventing and/or minimising air pollution, monitoring method(s), location, frequency and duration of monitoring as well as outline of approach for record keeping, response mechanisms and compliance reporting. The proactive and reactive management strategies used to control potential exceedances will include: • meteorological forecasts to predict when the risk of dust emissions may be high (due to adverse weather) and allow procedures and preparatory measures to be implemented; • visual monitoring to provide an effective mechanism for proactive control of dust at source, before it leaves the site; and • real-time boundary monitoring to provide alerts when short-term dust levels increase, to allow management of the location and intensity of activities or increase controls.

Responses to other issues raised by Jacfin Pty Ltd

Jacfin	Proponent Response
Character and Context	It is evident from the ongoing development and investment by major property and industrial companies at Eastern Creek that the facility is not impacting on the objectives of the WSEA SEPP nor the Eastern Creek Precinct Plan as asserted by Jacfin in its submission.
Increased Landfill and Recycling	As stated in the Response to Submission Report, it is important to separately account for by-products of recycling processes. This is because the purpose of the landfill limit is to influence greater application of recycling and reuse as waste management methods as opposed to 'direct-to-landfill' methods. Including by-products of recycling within a volume-based limit for landfilling undermines that intended outcome and ignores the influence of market forces which already drive waste processing towards more recycling and reuse. From both a commercial and environmental perspective, recycling and reuse is preferable. It should not be constrained by a landfill limit which is meant to promote recycling and reuse. In terms of the 'worst-case' scenario, the total amount approved to receive on site will remain 2M tpa. If there is 1.3M tpa landfilled (being 1M tpa 'direct-to-landfill' plus 30% of the materials received at the PSE and MPC) then there is a need to avoid 'double counting' the 300,000 tpa that arrives in the landfill via a chute from the MPC. That 300,000 tpa is already counted in the 1M tpa that arrives at the site as either segregated recyclable material or as co-mingled recyclable material. A better way to conceptualise the 'worst case' is to split the 2M tpa gate limit into two streams – direct to landfill waste being 1M tpa and other waste (recycling via PSE, MPC and SMA) being 1M tpa. The 'other' stream then produces a by-product which needs to go to landfill but this is not additional material coming in through the gate. It has already been counted towards the 2M tpa on the inbound truck, and this is simply further processing of material on site. In addition, to the above, the Jacfin submission fails to recognise that the recent application of a waste levy in Queensland has resulted in an increase in demand for landfill in the Sydney region.

Jacfin	Proponent Response
	Also, the waste that was being transported to Queensland contained up to 50% of recyclable material that was previously going direct to landfill. Approval of the modification by the Department would therefore ensure that: • waste arising in the Sydney region is recycled and disposed of in the Sydney region, thus meeting the Proximity Principle • recycling and resource recovery from existing waste streams would increase • jobs will be retained in Sydney • levies will continue to be raised ensuring further investment in the reduction and recycling of waste. In summary, the Proposal will play a critical role in meeting the intention of the State's Resource Recovery Targets and Circular Economy objectives through promotion of recycling and reuse of waste material accepted at the site.
Energy from Waste Facility	The acquisition of Dial a Dump Industries by Bingo Industries specifically excluded the proposed Energy from Waste Facility. This proposed modification is therefore not related to the Energy from Waste facility and should not be considered as part of the assessment of this modification.

Appendix A – Supplementary Noise Modelling Assessment

23 September 2019

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Re: Supplementary acoustic monitoring and analysis

Dear David,

1 Existing noise levels

Whilst EMM considers the adopted baseline noise monitoring data in the NIA as representative, an update of baseline monitoring was completed in response to submissions on the project application.

Unattended noise monitoring was conducted to confirm previously (2014 sampling) defined representative ambient noise levels at the nearest potentially most exposed residential areas surrounding site. Noise loggers were installed at:

- 170 McFarlane Drive, Minchinbury (north of site); and
- 8 Swampen Street, Erskine Park (west of site).

The logger locations were selected after giving due consideration to other noise sources which may influence the readings (e.g. mechanical plant), accessibility and security issues for the noise monitoring devices. The loggers were in place from 28 August to 11 September 2019 (14 days). The daily tabulated and charted data is attached at Appendix A.

The noise loggers were programmed to record statistical noise level indices continuously in 15-minute intervals in accordance with the requirements of the NPfI, including the L_{Amax} , L_{A1} , L_{A10} , L_{A50} , L_{A90} , L_{A99} , L_{Amin} and the L_{Aeq} . Calibration of all instrumentation was checked prior to and following measurements. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. Weather data for the survey period was obtained from the Bureau of Meteorology automatic weather station (AWS) at Horsley Park equestrian centre (AWS ID number 067119), approximately 6 kilometres (km) south-east of the site. The wind speed and rainfall data were used to exclude noise data during periods of any rainfall and/or wind speeds in excess of 5 metres per second (m/s) (approximately 9 knots) in accordance with INP and NPfI methods.

A summary of existing background and ambient noise levels is given in the Table 1.1.

The 2019 background noise data has been compared to the background noise data referenced in the EMM Noise Impact Assessment (NIA) (EMM 2018) which was sourced from an historic noise assessment undertaken in 2014. For Minchinbury, the data indicates that daytime background levels are higher in 2019, while the evening and night are lower. For Erskine Park, the data indicates the same background level for the daytime, while evening is lower and night is higher in 2019. The loggers were placed in similar acoustic environments and therefore it is considered appropriate to compare the noise levels (the 2014 locations were not accessible at the time of deployment of instrumentation).

Table 1.1 **Summary of existing background and ambient noise levels**

Monitoring location	Period ¹	Rating Background Level ² (RBL), dB	Ambient noise level dB, $L_{Aeq,period}$ ³
2014 Data	Day	43	55
BG1 (24 Cobbler Crescent, Minchinbury)	Evening	48	54
	Night	41	51
2019 Data	Day	46	55
170 McFarlane Drive, Minchinbury	Evening	44	50
	Night	40	50
2014 Data	Day	37	53
BG2 (4 Blackbird Glen, Erskine Park)	Evening	44	57
	Night	35	46
2019 Data	Day	37	51
8 Swamphen Street, Erskine Park	Evening	39	46
	Night	39	48

Notes: 1. Monday to Saturday: Daytime 7.00 am to 6.00 pm, Evening 6.00 pm to 10.00 pm, Night-time 10.00 pm to 7.00 am.
On Sundays and Public Holidays: Daytime 8.00 am - 6.00 pm, Evening 6.00 pm - 10.00 pm, Night-time 10.00 pm - 8.00 am.
2. The RBL is an INP/NPfl term and is used represent the background noise level.
3. $L_{Aeq(period)}$ is the energy averaged noise level over the measurement period and representative of general ambient noise.
Day period is 7.00 am-10.00 pm and the night period is 10.00 pm-7.00 am

2 Project specific noise level (PSNL)

In accordance with the INP, the PSNLs were revisited in the context of the 2019 data as follows.

The intrusiveness criteria require that $L_{Aeq,15\text{ minute}}$ noise levels from the subject site during the relevant operational periods (i.e. day, evening and night) do not exceed the RBL by more than 5 dB.

Table 2.1 presents the intrusive noise criteria determined for the site based on the adopted 2019 RBLs. Compared to the NIA that adopted 2014 data, the resulting intrusiveness criteria mean Minchinbury residences have marginally higher daytime and evening criteria but a marginally lower night criterion. For Erskine Park residences, the daytime and evening intrusiveness criteria are unchanged while the night is marginally higher. The changes are considered within industry accepted tolerances for field noise measurements (ie 1-3dB).

Table 2.1 **Intrusive noise criteria**

Location	Period ¹	Measured RBL, dB	Adopted RBL, dB	Intrusive target dB, $L_{Aeq,15 \text{ minute}}$
Residential assessment locations (Minchinbury) (1-8)	Day	46	46	51
	Evening	44	44	49
	Night	40	40	45
	Morning Shoulder ³	N/A	43	48
Residential assessment locations (Erskine Park) (9-11)	Day	37	37	42
	Evening	39	37 ²	42
	Night	39	37 ²	42
	Morning Shoulder ³	N/A	37	42

Notes: 1. Day: 7 am - 6 pm Monday - Saturday; 8 am - 6 pm Sundays and public holidays; Evening: 6 pm - 10 pm; Night: all remaining periods.
2. The RBL measured for day has been adopted for the evening and night period in accordance with the EPA's approach.
3. The RBL adopted for the morning shoulder period has been taken as the midpoint of the RBLs determined for day and night-time periods in accordance with the INP Application Notes.

Reviewing the approach to amenity criteria, including the SEPP59 Zone 1 requirements described in the NIA, the above intrusiveness criteria remain the limiting and therefore become the PSNLs for the site. In summary, the final PSNLs are comparable to those adopted in the NIA.

3 Plant and equipment

3.1 Measured sound power levels

The noise emission from individual plant or plant areas on the site were measured during a site visit on 13 September 2019.

To compare the data to Table 5.1 of the NIA, the noise measurements at the site were converted to sound power levels as shown in Table 3.1. The comparisons to the NIA data and total sound power level from site demonstrate good agreement. While some readings were identical or within industry accepted field measurement tolerances (e.g. 2dB), others varied more so either up or down. This was because other machinery was operating in proximity to the measurement location, could not be excluded and therefore measurements are not necessarily like for like. Importantly, the overall combined total noise levels for both sets of measurements is unchanged (ie 120.4dB). Hence predicted offsite noise levels presented previously remain representative.

Table 3.1 Operational plant and equipment sound power levels

Equipment item	Sound power level (L_w) per unit, $L_{Aeq,15 \text{ minute}}$, dB		Comments
	NIA (EMM 2018)	2019	
MPC ³	103 ¹	103	Measurement not repeated
Dozer	116 ²	116 ²	Not operating during either testing
Front end loader	105 ²	107 ¹	-
Crusher/Screen/Stacker/Excavator	113 ¹	117 ¹	2019 measurement included other items operating in close proximity
Compactor	116 ²	109 ¹	-
Conveyor	102 ²	108 ¹	2019 measurement included other items operating in close proximity
Truck & Dog/Haul Truck	105 (Driving)/ 97 (Idling) ²	99 ¹ (driving)	-
Maintenance – SMA	97	97 ¹	-
Maintenance – Landfill	97	97 ¹	-
Total combined L_w, dB	120.4	120.4	0 dB difference

Notes: 1. L_w calculated from direct measurement during site visit.
2. Taken from EMM database of similar equipment.
3. MPC comprises numerous activities including loading and unloading of trucks, sorting, stockpiling and processing of materials. As these processes occur in an enclosed building, the MPC has been modelled as a single source of noise.
The 2018 measurement continues to be representative and hence it was not considered necessary to re-measure this item.

3.2 Low frequency noise

Low frequency noise (LFN) is identified by the NSW EPA as a noise characteristic that is normally found to be more annoying to people than broad band noises. Hence, a test is used to identify its presence and whether a penalty should be applied to the subject noise source.

Fact sheet C of the NPfl (EPA 2017) provides guidelines for applying modifying factor corrections to account for low frequency noise. The NPfl specifies that a difference of 15 dB or more between site 'C-weighted' and site 'A-weighted' noise emission levels identifies the potential for increased annoyance.

Where a difference of 15 dB or more between site 'C-weighted' and site 'A-weighted' noise emission levels is identified, the one-third octave noise levels recorded should be compared to the values in Table C2 of the NPfl (EPA 2017), which has been reproduced in Table 3.2 below.

Table 3.2 One-third octave low-frequency noise thresholds - NPfl

One-third octave $L_{Zeq,15 \text{ minute}}$ threshold level													
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

The following modifying factor correction is to be applied where the site 'C-weighted' and site 'A-weighted' noise emission level is 15 dB or more and:

- where any of the one-third octave noise levels in Table 3.2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night period; or
- where any of the one-third octave noise levels in Table 3.2 are exceeded by more than 5 dB and cannot be mitigated, a 2 dB positive adjustment to measured/predicted A-weighted levels applies for the day period and a 5 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night period.

The spectral data obtained from EMM's noise measurements of site plant were used as input to the three-dimensional model. The predicted noise levels at Erskine Park receiver locations (R9 to R11) show the site 'C-weighted' minus site 'A-weighted' level is at or above 15dB for proposed operations.

Subsequent to this finding, the predicted site noise spectra at Erskine Park receiver locations were reviewed against the thresholds in Table 3.2 which found that a 2dB LFN correction would apply to evening and night (including morning shoulder) predictions. The Erskine Park results (R9 to R11) presented in the NIA Table 5.2 have therefore been updated for proposed operations inclusive of a 2dB LFN correction to evening, night and morning shoulder as shown in Table 3.3.

The results demonstrate that PSNLs can be achieved at all receivers. Furthermore, EMM's observations during logger deployment and retrieval to residential areas of Minchinbury and Erskine Park confirms site noise levels are not audible and hence LFN is unlikely to be an additional nuisance implying the approach herein is highly conservative.

Table 3.3 Updated predicted noise levels – proposed operations

Assessment location	Period	Proposed operations, dB		PSNL, dB (From 2019 RBLs)
		Calm	Adverse ¹	
1	Day	47	47	51 L _{Aeq,15 minute}
	Evening	43	46	49 L _{Aeq,15 minute} ¹
	Night	40	43	45 L _{Aeq,15 minute}
	Morning Shoulder	43	46	48 L _{Aeq,15 minute}
2	Day	47	47	51 L _{Aeq,15 minute}
	Evening	44	47	49 L _{Aeq,15 minute} ¹
	Night	41	43	45 L _{Aeq,15 minute}
	Morning Shoulder	44	47	48 L _{Aeq,15 minute}
3	Day	48	48	51 L _{Aeq,15 minute}
	Evening	44	47	49 L _{Aeq,15 minute} ¹
	Night	41	44	45 L _{Aeq,15 minute}
	Morning Shoulder	44	47	48 L _{Aeq,15 minute}
4	Day	45	47	51 L _{Aeq,15 minute}
	Evening	42	45	49 L _{Aeq,15 minute} ¹
	Night	39	42	45 L _{Aeq,15 minute}
	Morning Shoulder	42	45	48 L _{Aeq,15 minute}
5	Day	45	47	51 L _{Aeq,15 minute}
	Evening	43	45	49 L _{Aeq,15 minute} ¹
	Night	39	42	45 L _{Aeq,15 minute}
	Morning Shoulder	43	45	48 L _{Aeq,15 minute}
6	Day	43	46	51 L _{Aeq,15 minute}
	Evening	40	43	49 L _{Aeq,15 minute} ¹
	Night	37	39	45 L _{Aeq,15 minute}
	Morning Shoulder	40	43	48 L _{Aeq,15 minute}
7	Day	45	47	51 L _{Aeq,15 minute}
	Evening	42	45	49 L _{Aeq,15 minute} ¹
	Night	38	41	45 L _{Aeq,15 minute}
	Morning Shoulder	42	45	48 L _{Aeq,15 minute}
8	Day	45	47	51 L _{Aeq,15 minute}
	Evening	42	45	49 L _{Aeq,15 minute} ¹
	Night	38	41	45 L _{Aeq,15 minute}
	Morning Shoulder	42	45	48 L _{Aeq,15 minute}
9	Day	39	39	42 L _{Aeq,15 minute}
	Evening	39	42	42 L _{Aeq,15 minute}
	Night	37	39	42 L _{Aeq,15 minute}
	Morning Shoulder	39	39	42 L _{Aeq,15 minute}
10	Day	39	39	42 L _{Aeq,15 minute}
	Evening	39	42	42 L _{Aeq,15 minute}
	Night	<35	37	42 L _{Aeq,15 minute}
	Morning Shoulder	39	39	42 L _{Aeq,15 minute}
11	Day	39	39	42 L _{Aeq,15 minute}
	Evening	39	42	42 L _{Aeq,15 minute}
	Night	<35	39	42 L _{Aeq,15 minute}
	Morning Shoulder	39	39	42 L _{Aeq,15 minute}

We trust the above meets your requirements and if you need anything further please contact us.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Najah Ishac', with a stylized, flowing script.

Najah Ishac (MEngSc, BE, MEAust, MAAS, JP)

Director, National Acoustics Leader

nishac@emmconsulting.com.au

Appendix A

Unattended noise monitoring data 2019

Date	ABL Day	ABL Evening	ABL Night	Leq 11hr Day	Leq 4hr Evening
Wednesday, 28-08-19	0	43.5	41.1	0	49.3
Thursday, 29-08-19	0	0	0	0	0
Friday, 30-08-19	51.1	47.6	41.3	55.4	51.6
Saturday, 31-08-19	45.7	41.7	41	54.1	48.5
Sunday, 01-09-19	41.8	42.5	39.4	52.2	48.3
Monday, 02-09-19	46.9	44.3	38.3	53.6	50.2
Tuesday, 03-09-19	43.4	43.1	42.1	52	49.2
Wednesday, 04-09-19	43.5	45.7	40.5	53.5	51.8
Thursday, 05-09-19	44.4	42.7	39.2	52.5	48.3
Friday, 06-09-19	44.4	0	39.1	60.3	0
Saturday, 07-09-19	48.9	44	40.4	55.6	51.2
Sunday, 08-09-19	46.3	44.4	40.2	54.3	51.1
Monday, 09-09-19	50.8	45.4	0	56.9	49.9
Tuesday, 10-09-19	0	0	0	0	0
Summary Values	45.7	44	40.4	55.3	50.1

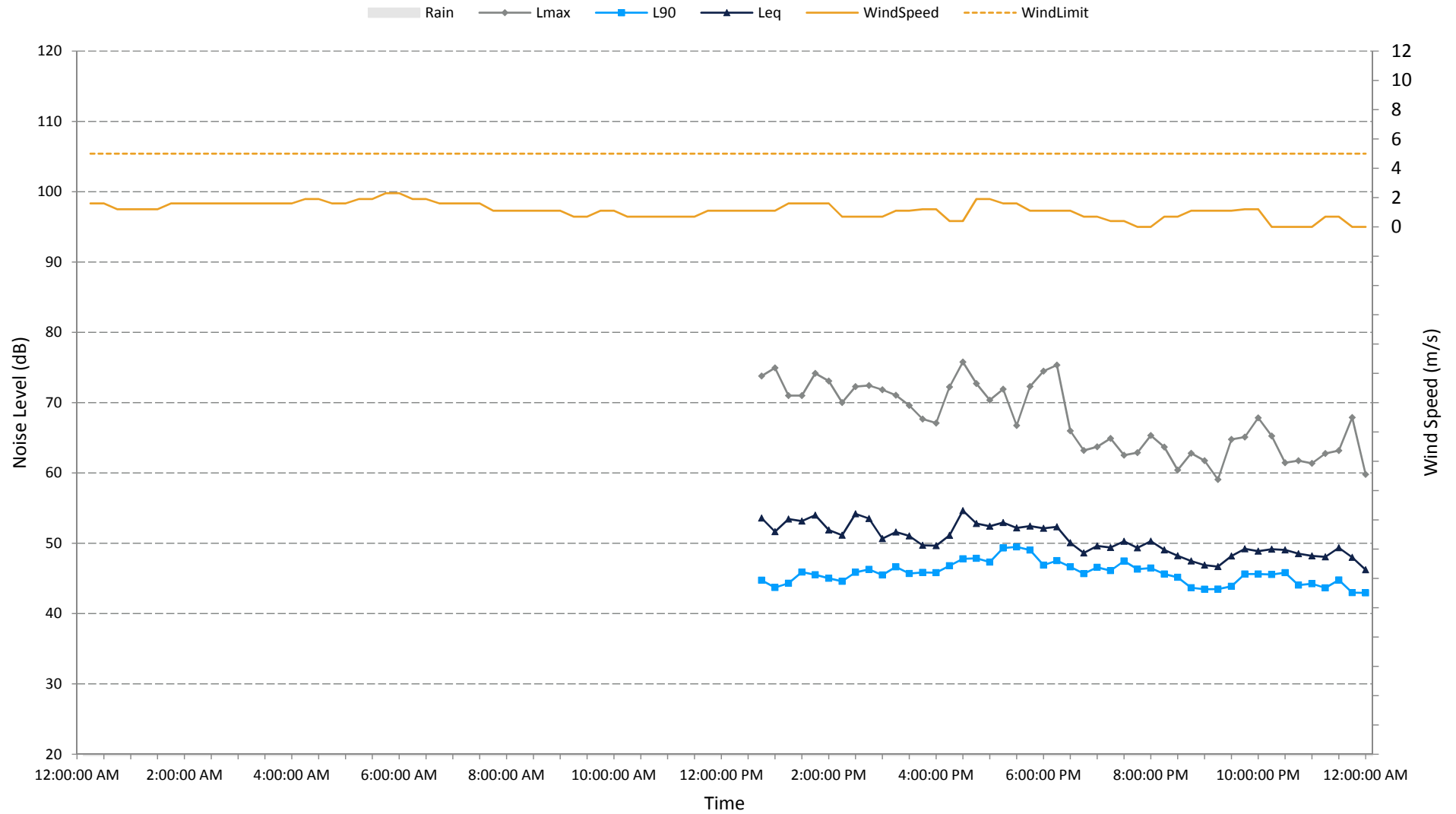
Notes:

0 indicates periods with too few valid samples due to weather or logger operation

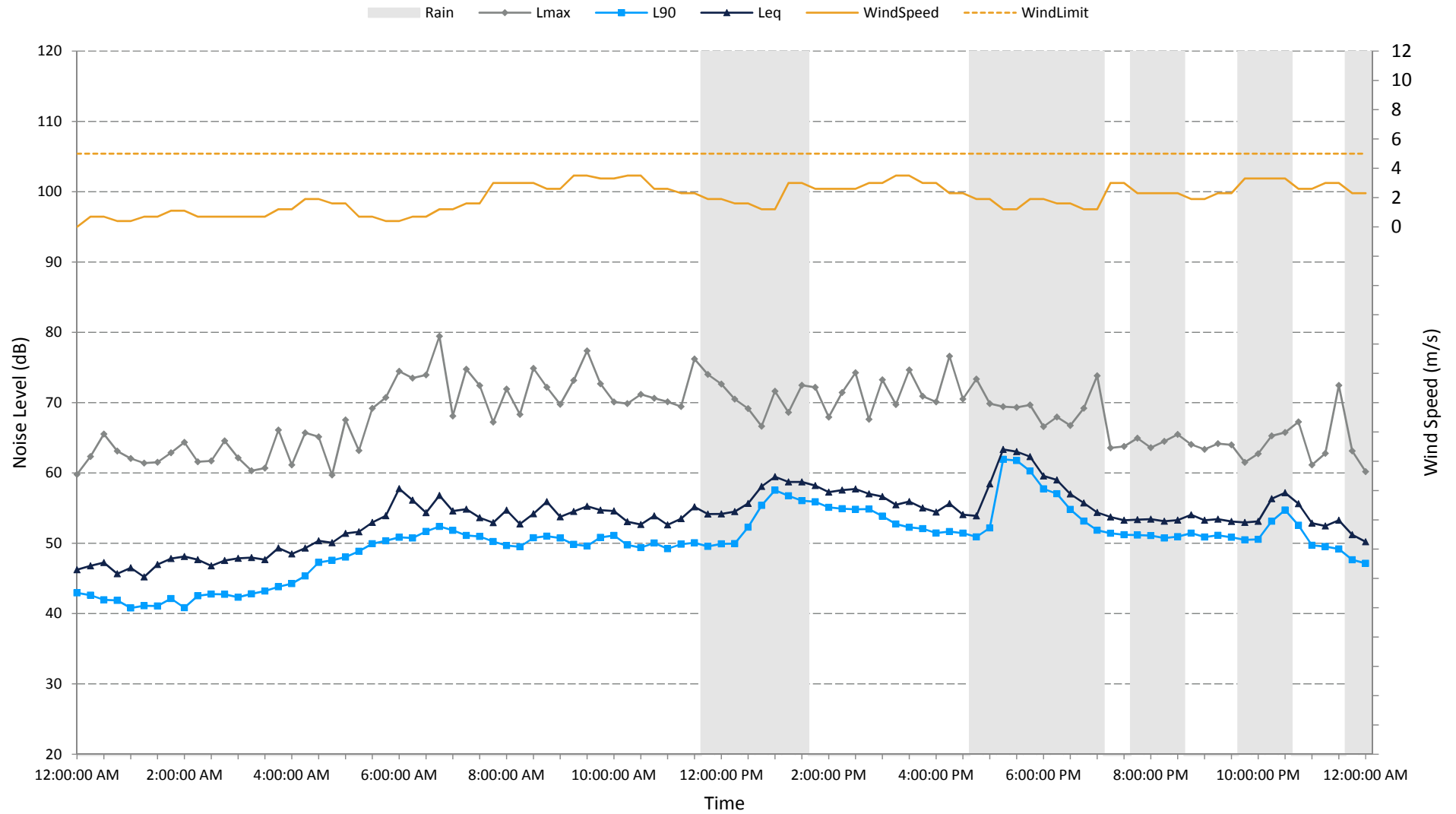
Leq24hr encompasses the period 7am to 7am

Leq 9hr Night	Leq 15hr Day	Leq 24hr Day	Leq 8hr
51	0	0	49.8
0	0	0	0
49.5	54.7	53.3	48.8
48.3	53.1	51.9	47.7
50.1	51.5	51	48.8
49.9	53	52	48.8
51	51.4	51.3	50.1
50.9	53.1	52.4	50
49	51.7	50.9	48.2
51.5	0	57.4	51.2
47.8	54.8	53.2	46.8
50.6	53.6	52.7	49.6
0	55.7	0	0
0	0	0	0
50.1	53.5	53.1	49.2

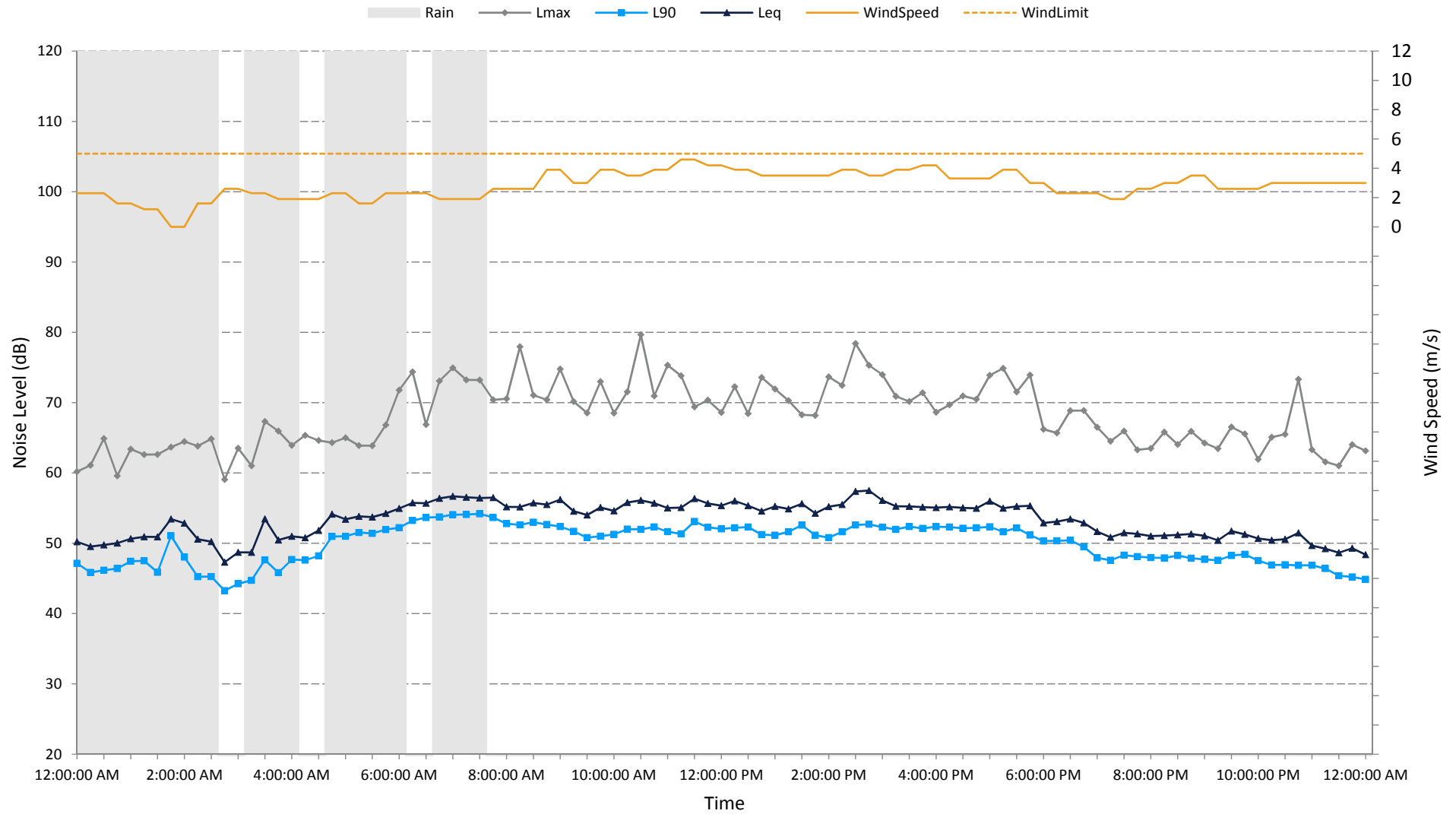
Measured ambient noise levels
170 McFarlane Drive
Wednesday, 28-08-19



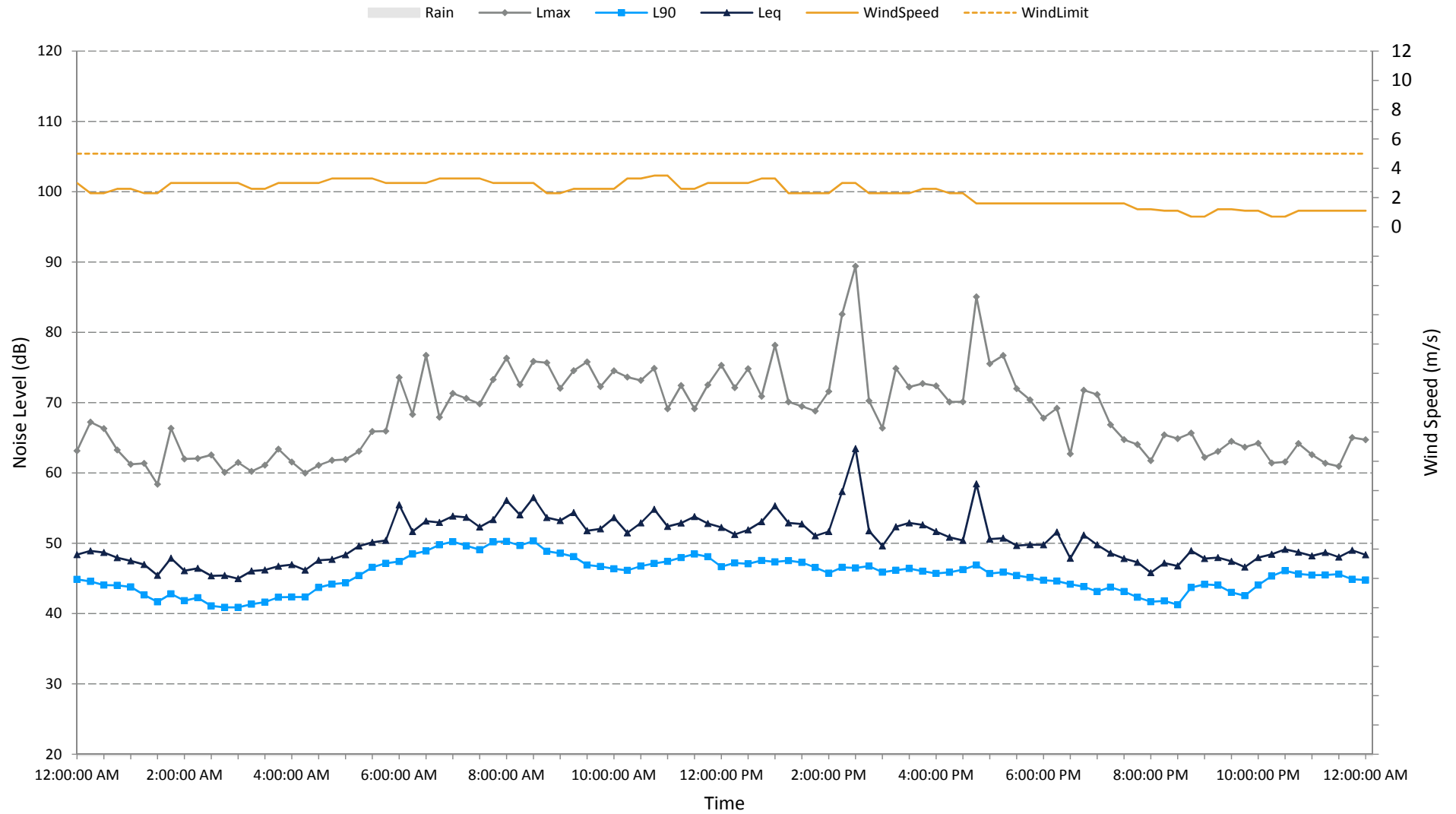
Measured ambient noise levels
170 McFarlane Drive
Thursday, 29-08-19



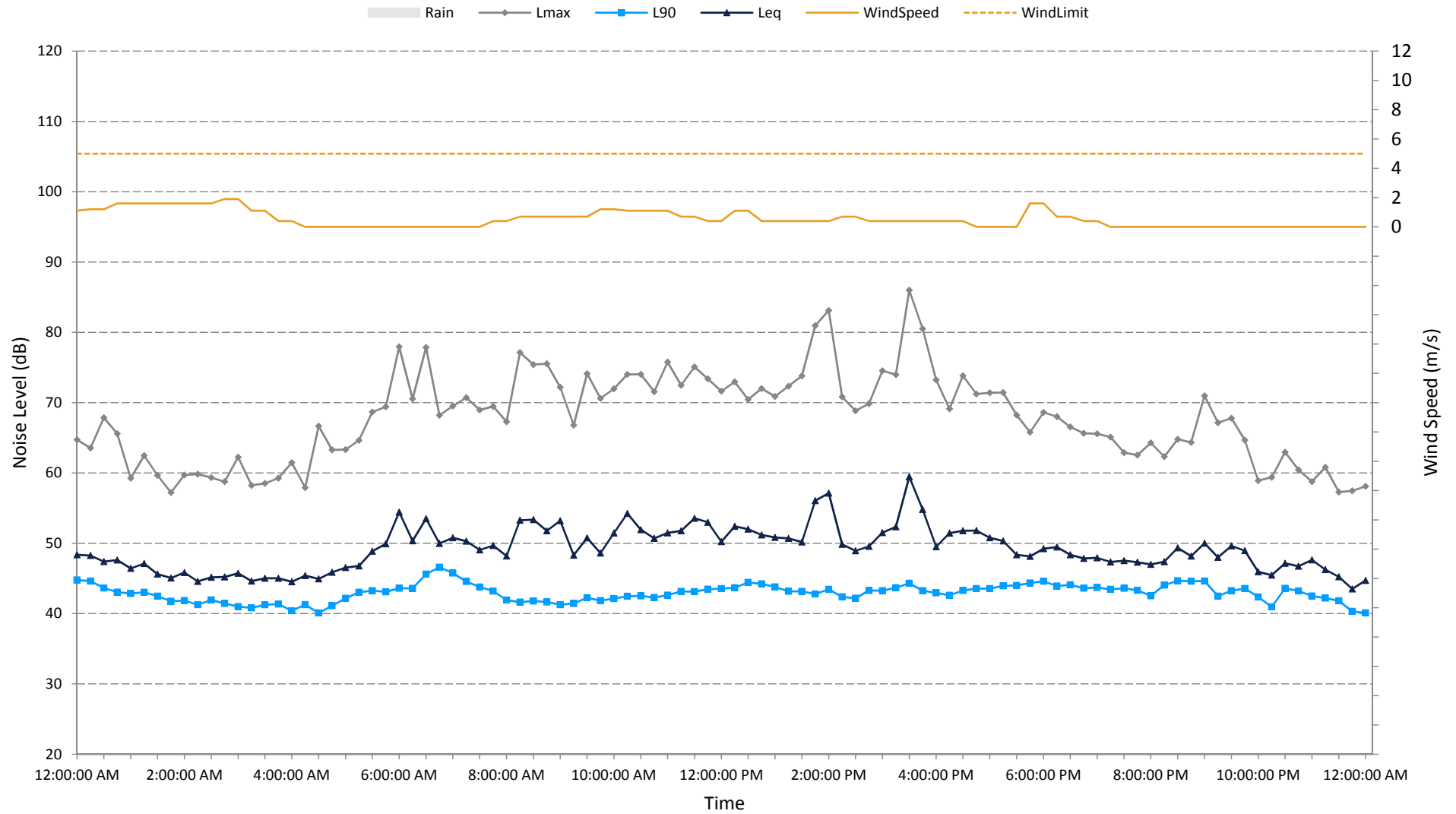
Measured ambient noise levels
170 McFarlane Drive
Friday, 30-08-19



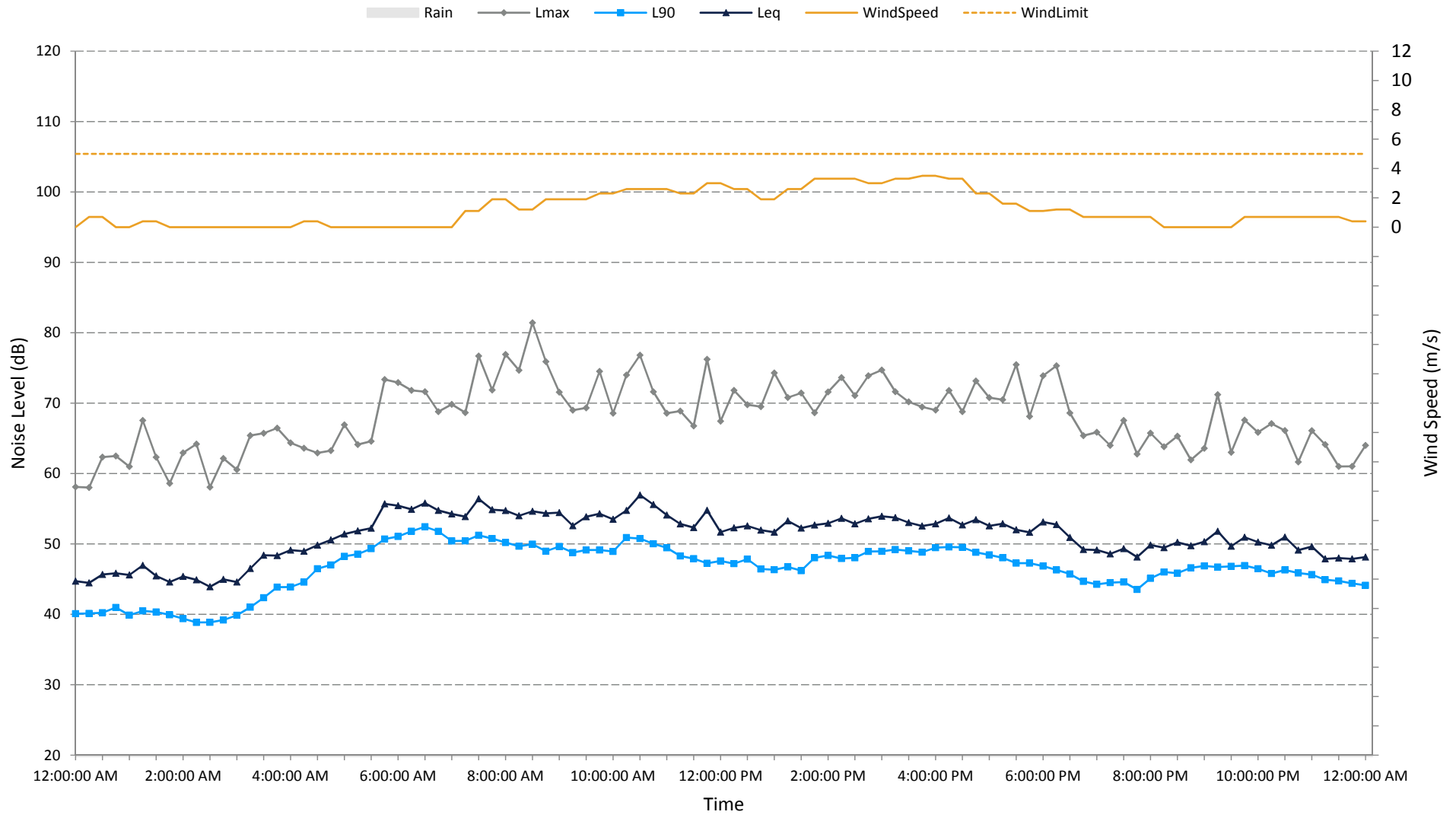
Measured ambient noise levels
170 McFarlane Drive
Saturday, 31-08-19



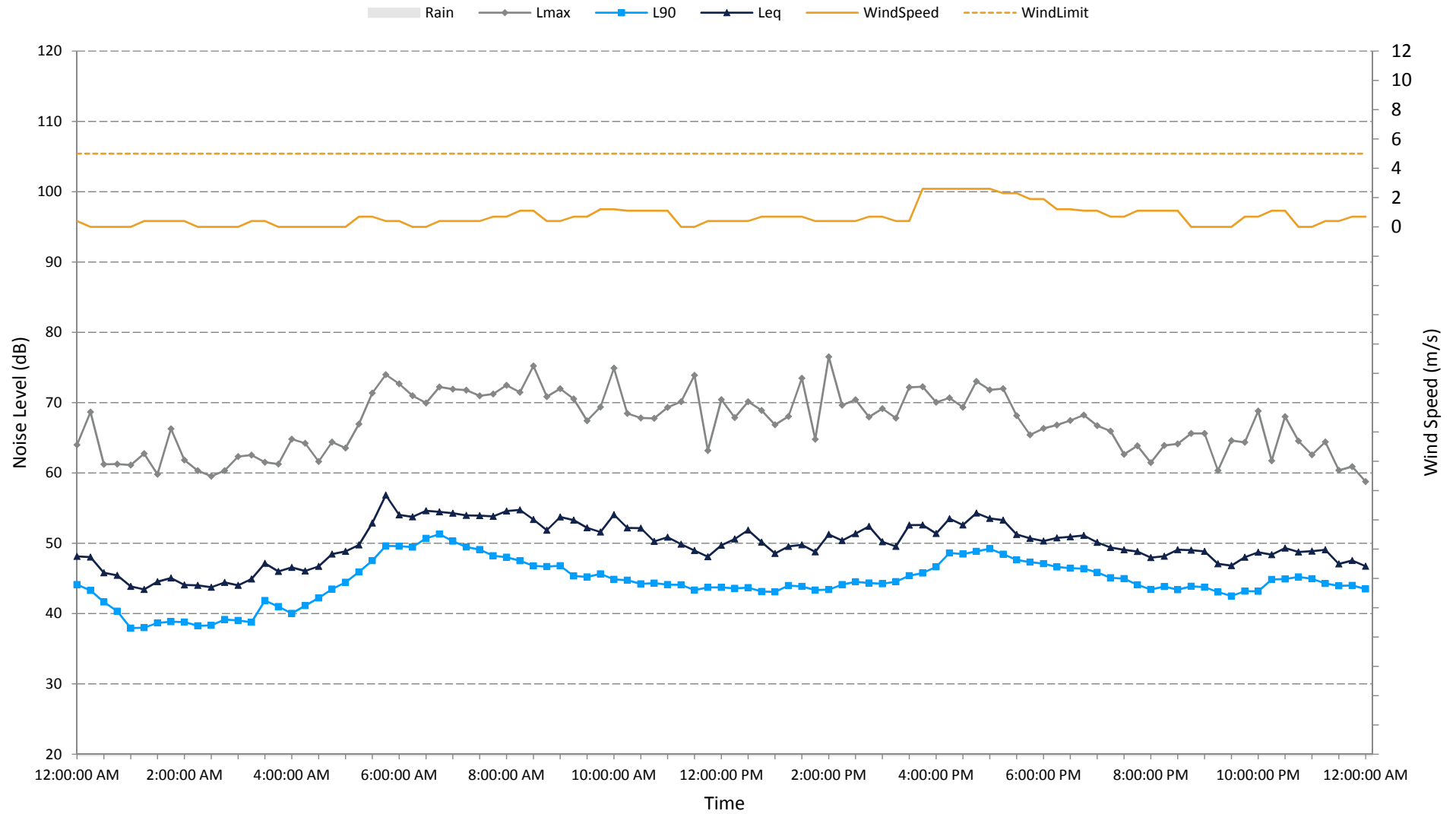
Measured ambient noise levels
170 McFarlane Drive
Sunday, 01-09-19



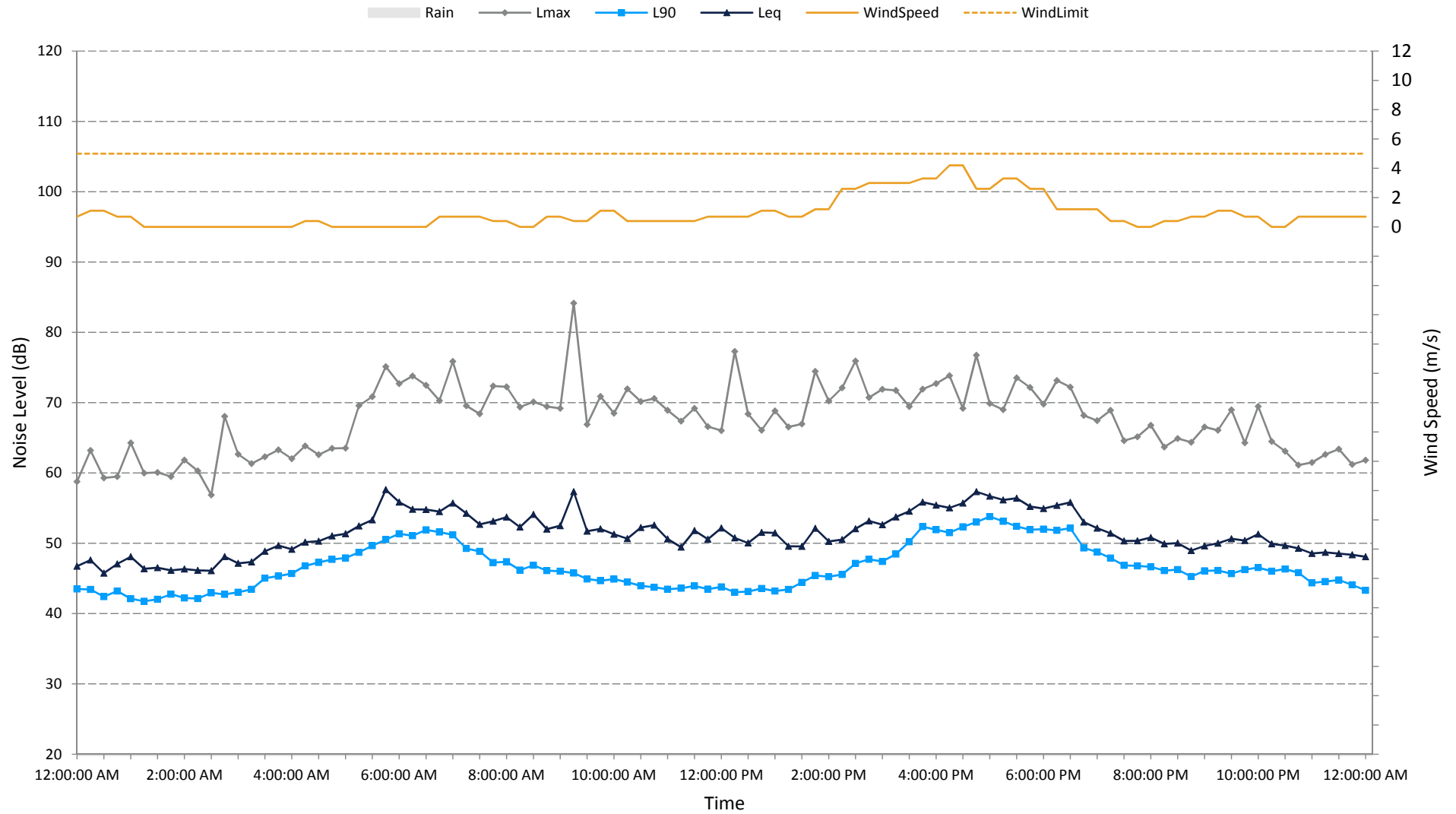
Measured ambient noise levels
170 McFarlane Drive
Monday, 02-09-19



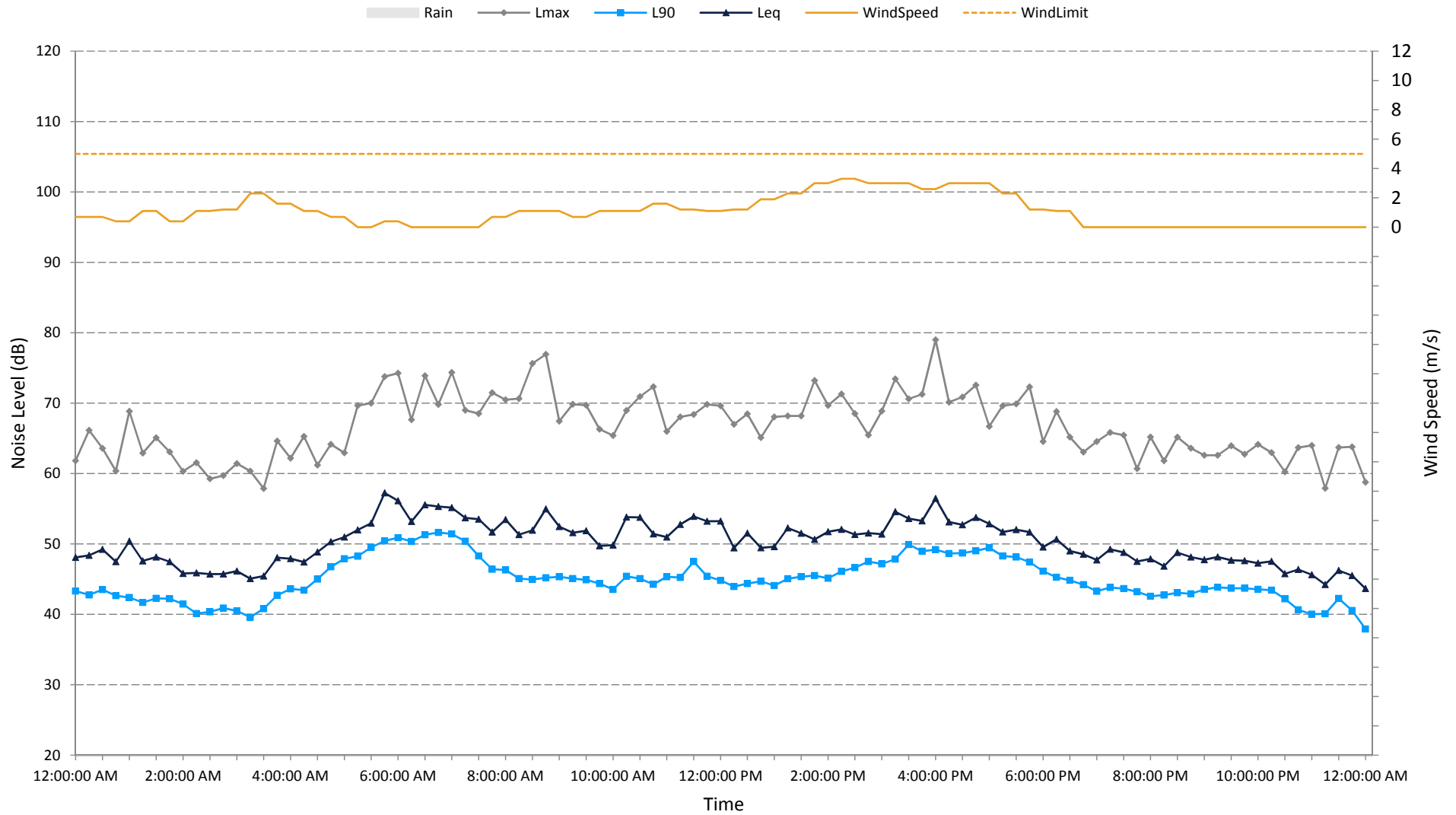
Measured ambient noise levels
170 McFarlane Drive
Tuesday, 03-09-19



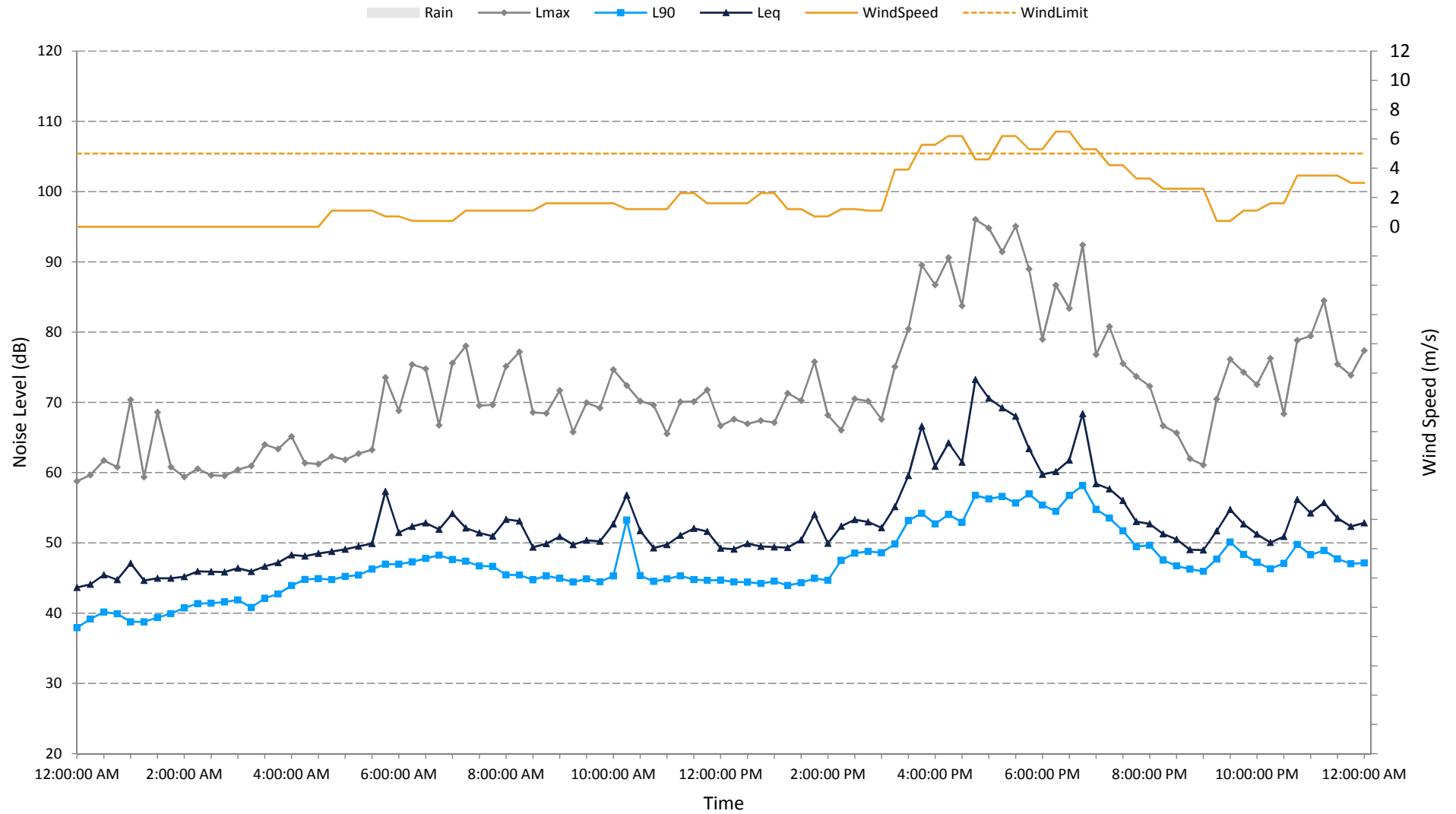
Measured ambient noise levels
170 McFarlane Drive
Wednesday, 04-09-19



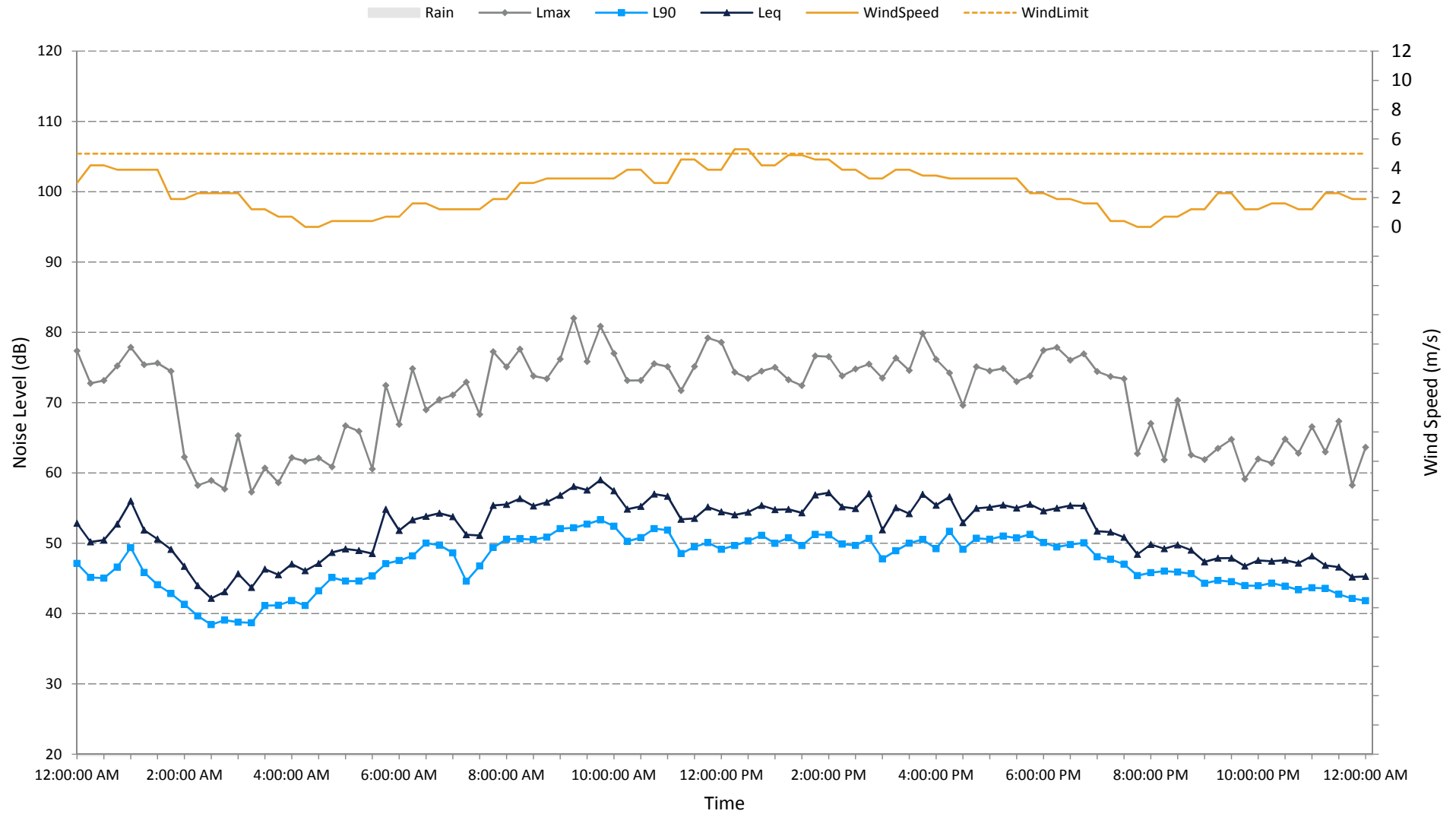
Measured ambient noise levels
170 McFarlane Drive
Thursday, 05-09-19



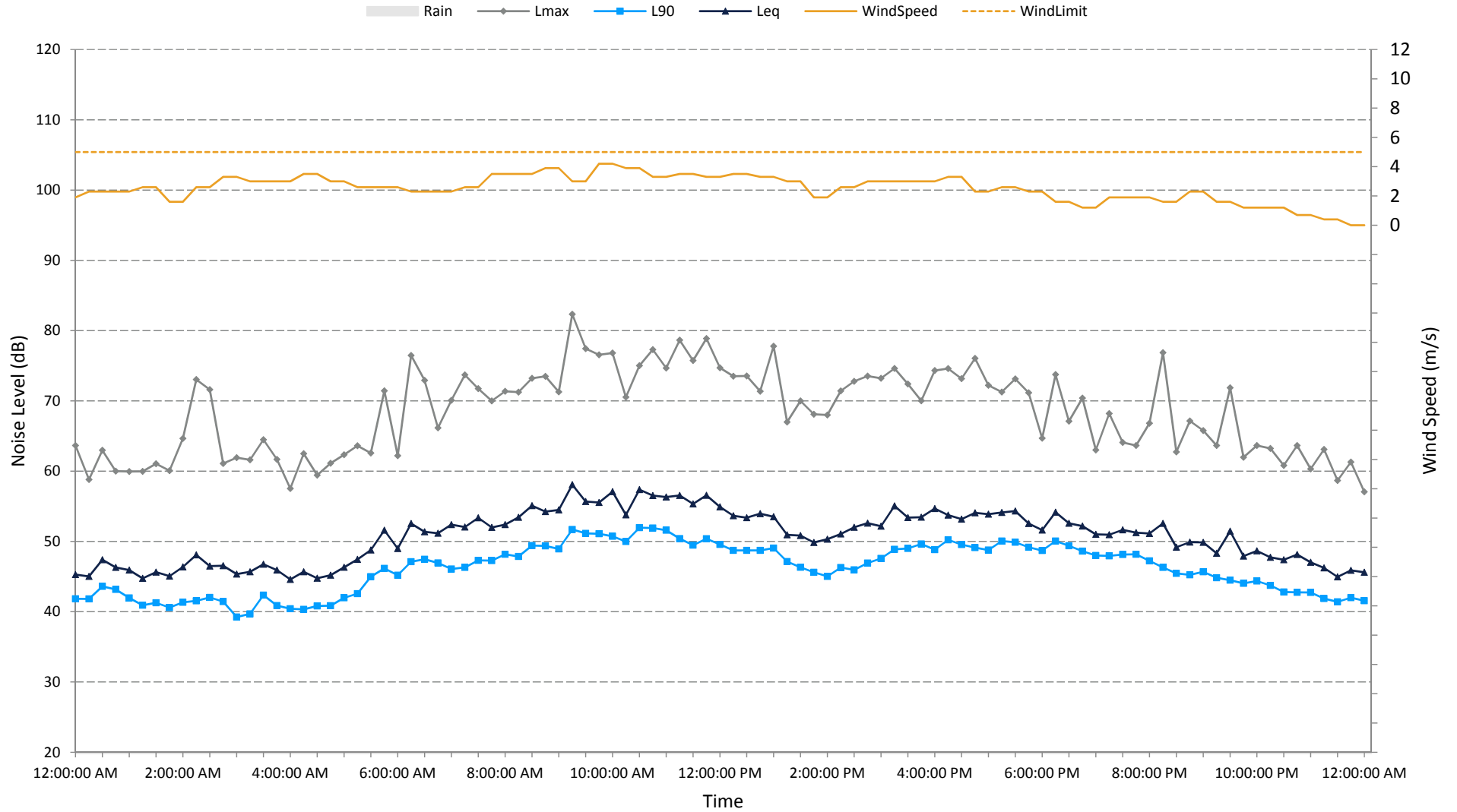
Measured ambient noise levels
170 McFarlane Drive
Friday, 06-09-19



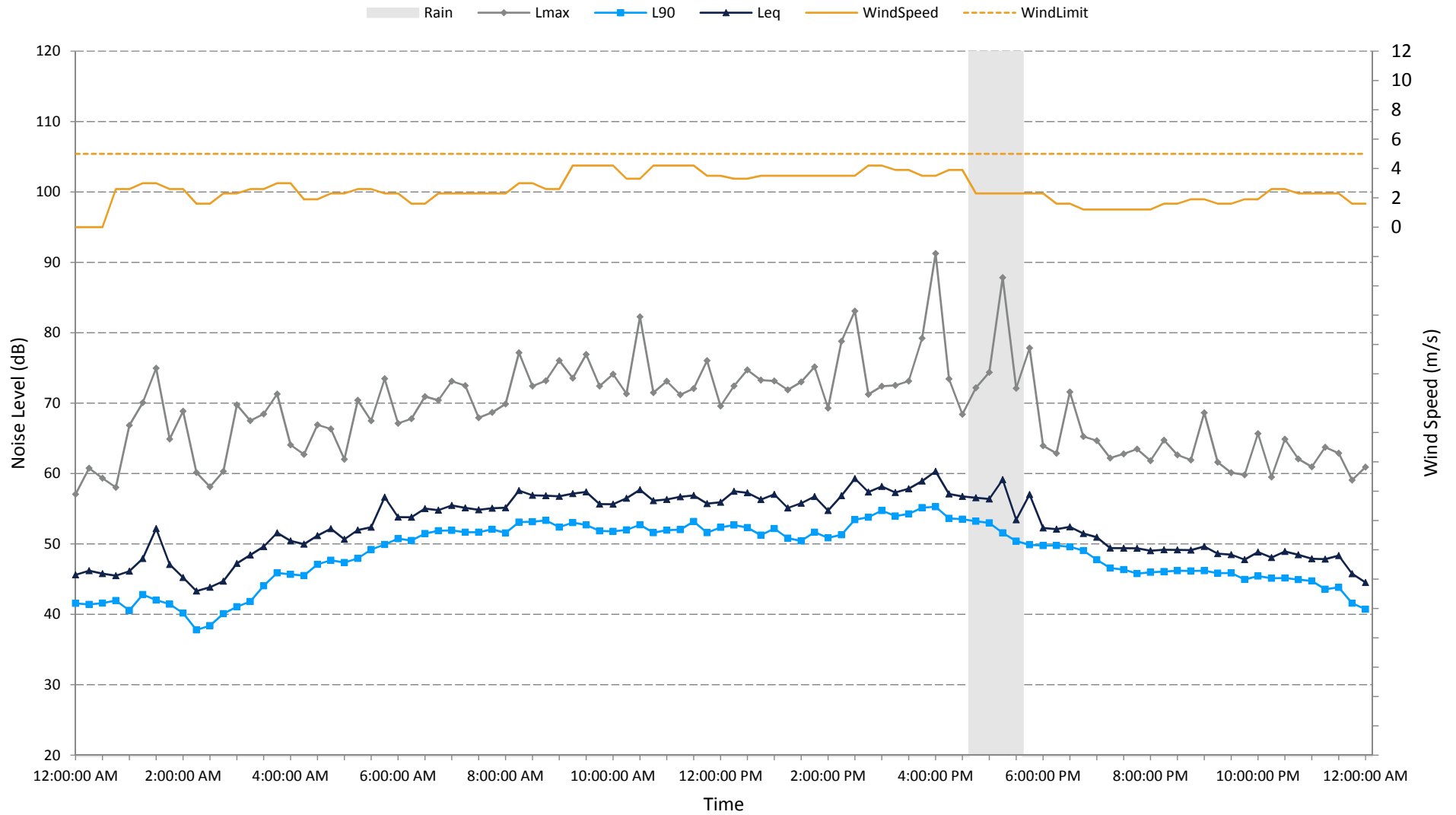
Measured ambient noise levels
170 McFarlane Drive
Saturday, 07-09-19



Measured ambient noise levels
170 McFarlane Drive
Sunday, 08-09-19



Measured ambient noise levels
170 McFarlane Drive
Monday, 09-09-19



Date	ABL Day	ABL Evening	ABL Night	L_{Aeq,11 hour} Day	L_{Aeq,4 hour} Evening
Wednesday, 28-08-19	0	40	39	0	45
Thursday, 29-08-19	0	0	0	0	0
Friday, 30-08-19	41	37	34	48	42
Saturday, 31-08-19	35	35	36	46	40
Sunday, 01-09-19	34	43	39	48	49
Monday, 02-09-19	36	38	39	48	45
Tuesday, 03-09-19	35	40	40	50	45
Wednesday, 04-09-19	36	40	39	48	49
Thursday, 05-09-19	39	43	40	50	48
Friday, 06-09-19	40	0	35	58	0
Saturday, 07-09-19	44	39	34	54	47
Sunday, 08-09-19	39	34	0	50	47
Monday, 09-09-19	0	0	0	0	0
Summary Values	37	39	39	51	46

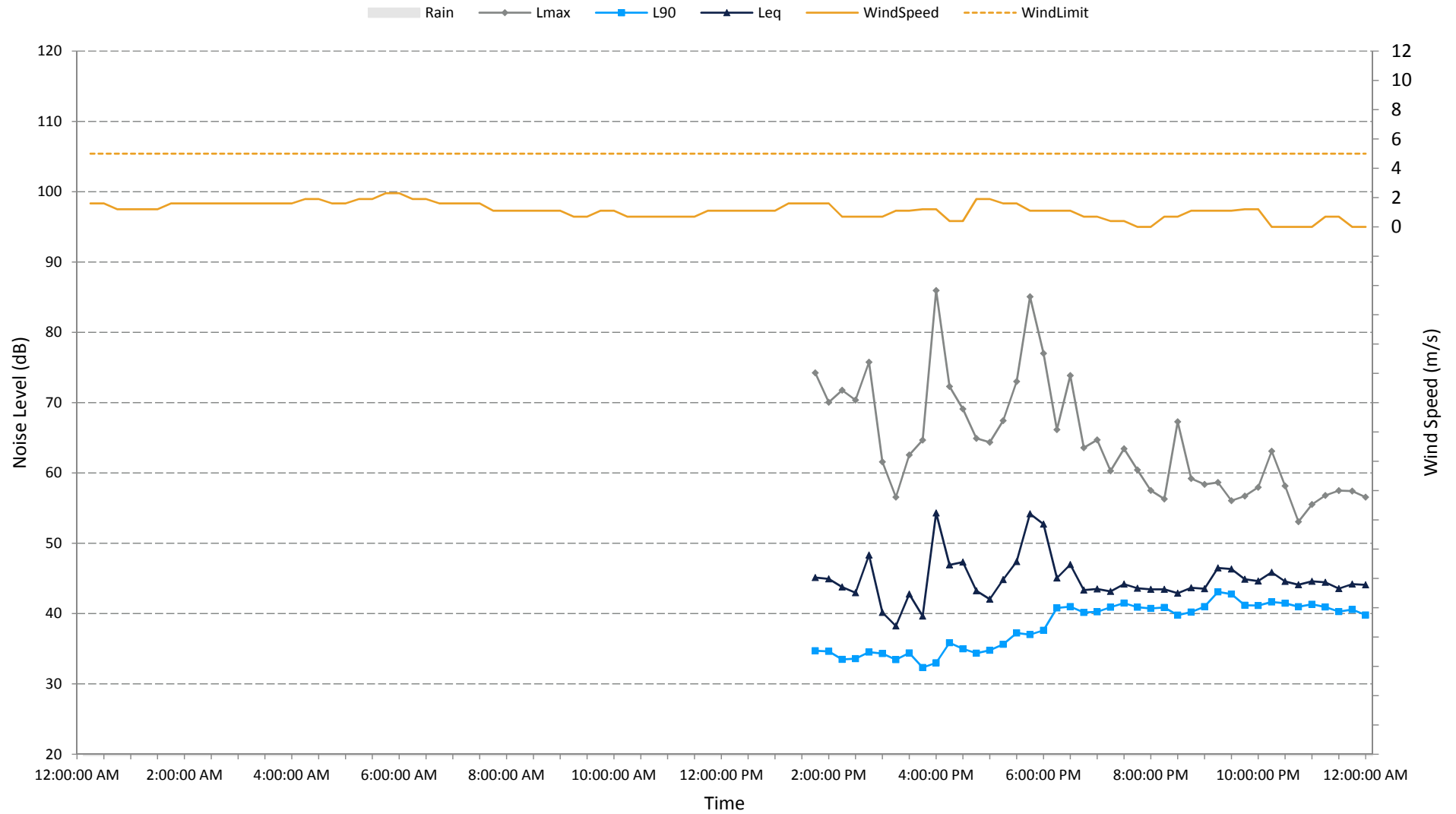
Notes:

0 indicates periods with too few valid samples due to weather or logger operation

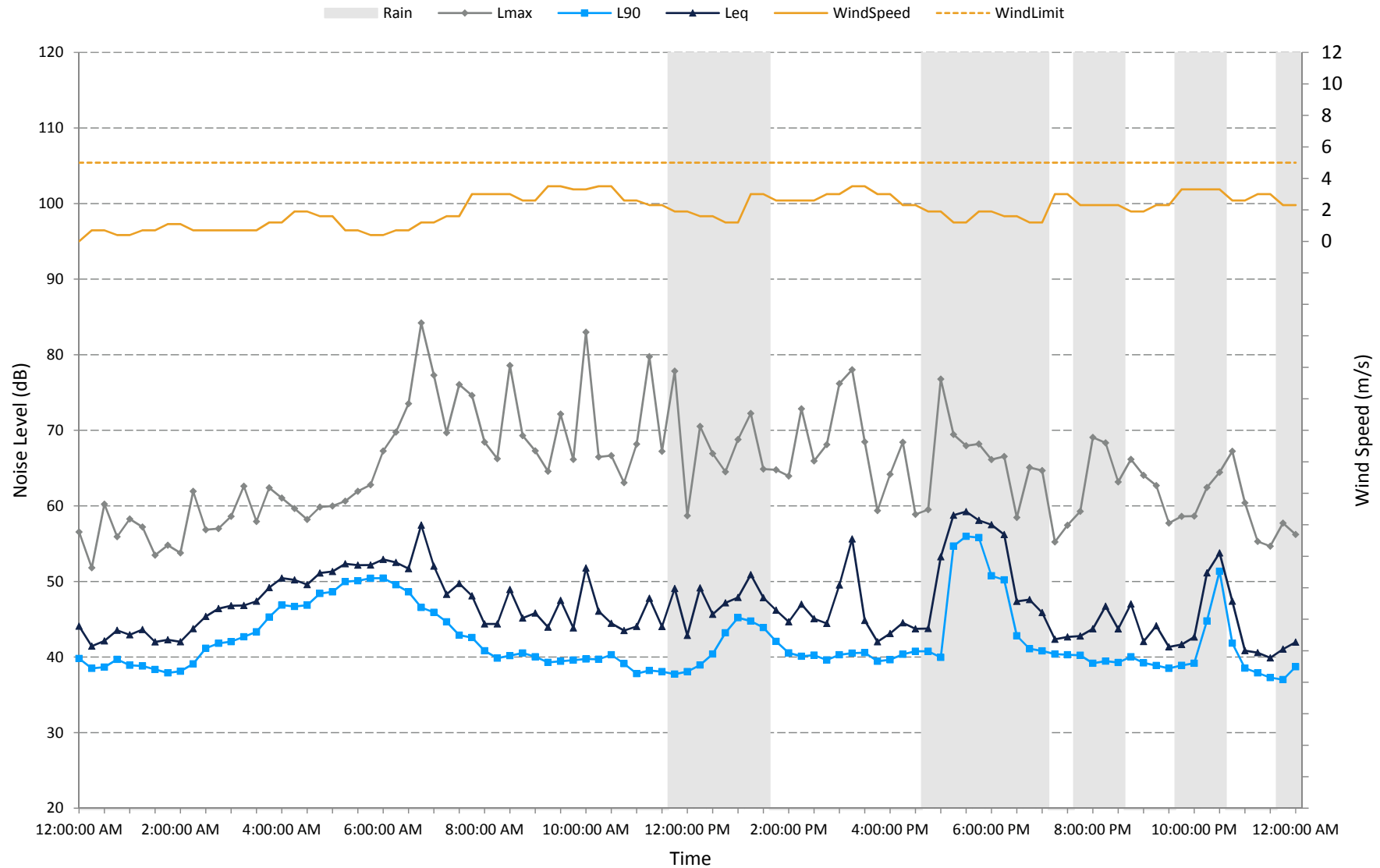
Leq24hr encompasses the period 7am to 7am

L_{Aeq,9 hour} Night	L_{Aeq,15 hour} Day	L_{Aeq,24 hour} Day	L_{Aeq,8 hour} Night
49	0	0	48
0	0	0	0
46	47	47	39
44	45	44	41
48	48	48	47
48	47	48	46
49	49	49	48
50	48	49	48
48	50	49	47
49	0	55	49
45	53	51	44
0	49	48	0
0	0	0	0
48	49	50	46

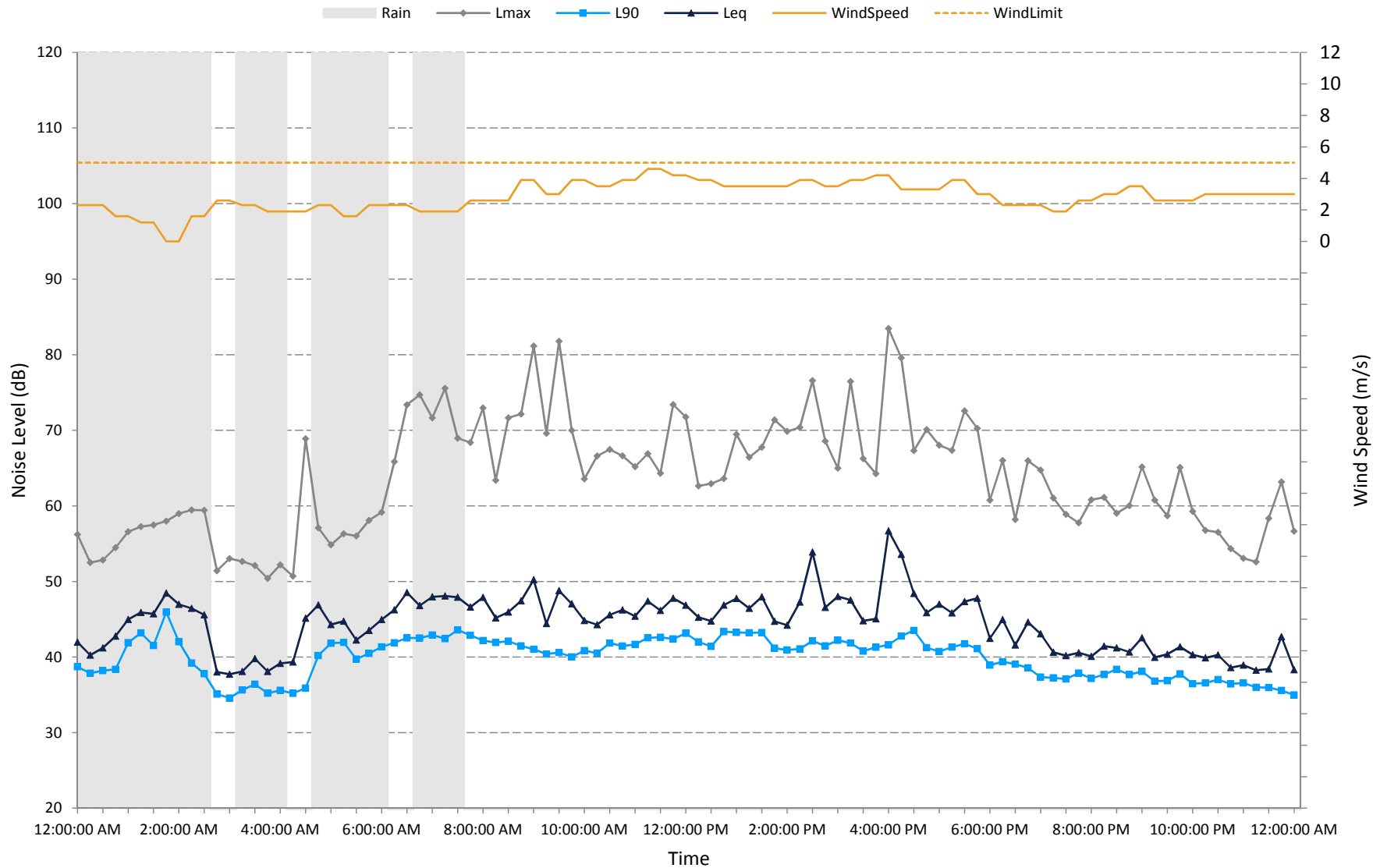
Measured ambient noise levels
8 Swamphen Street
Wednesday, 28-08-19



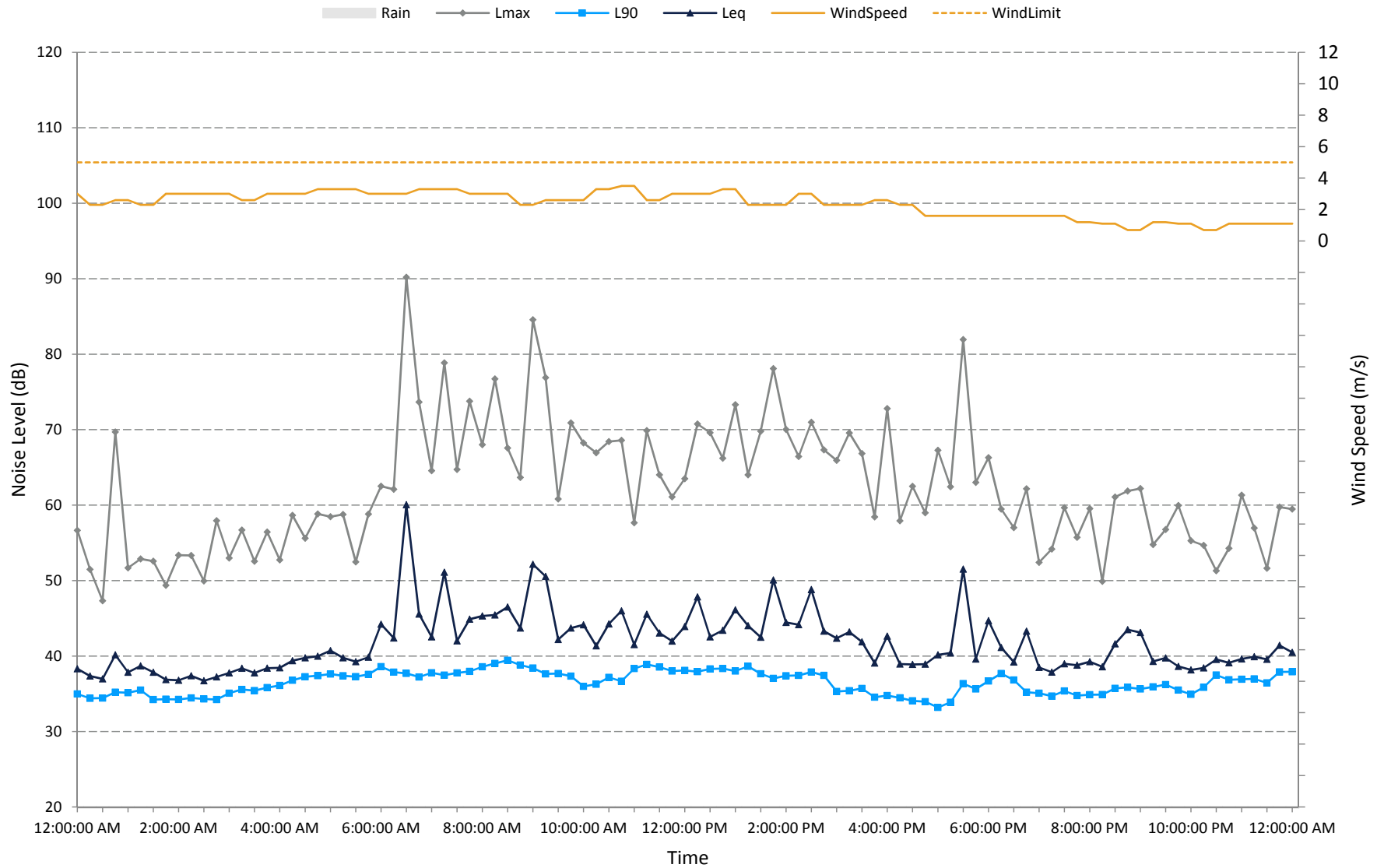
Measured ambient noise levels
8 Swamphen Street
Thursday, 29-08-19



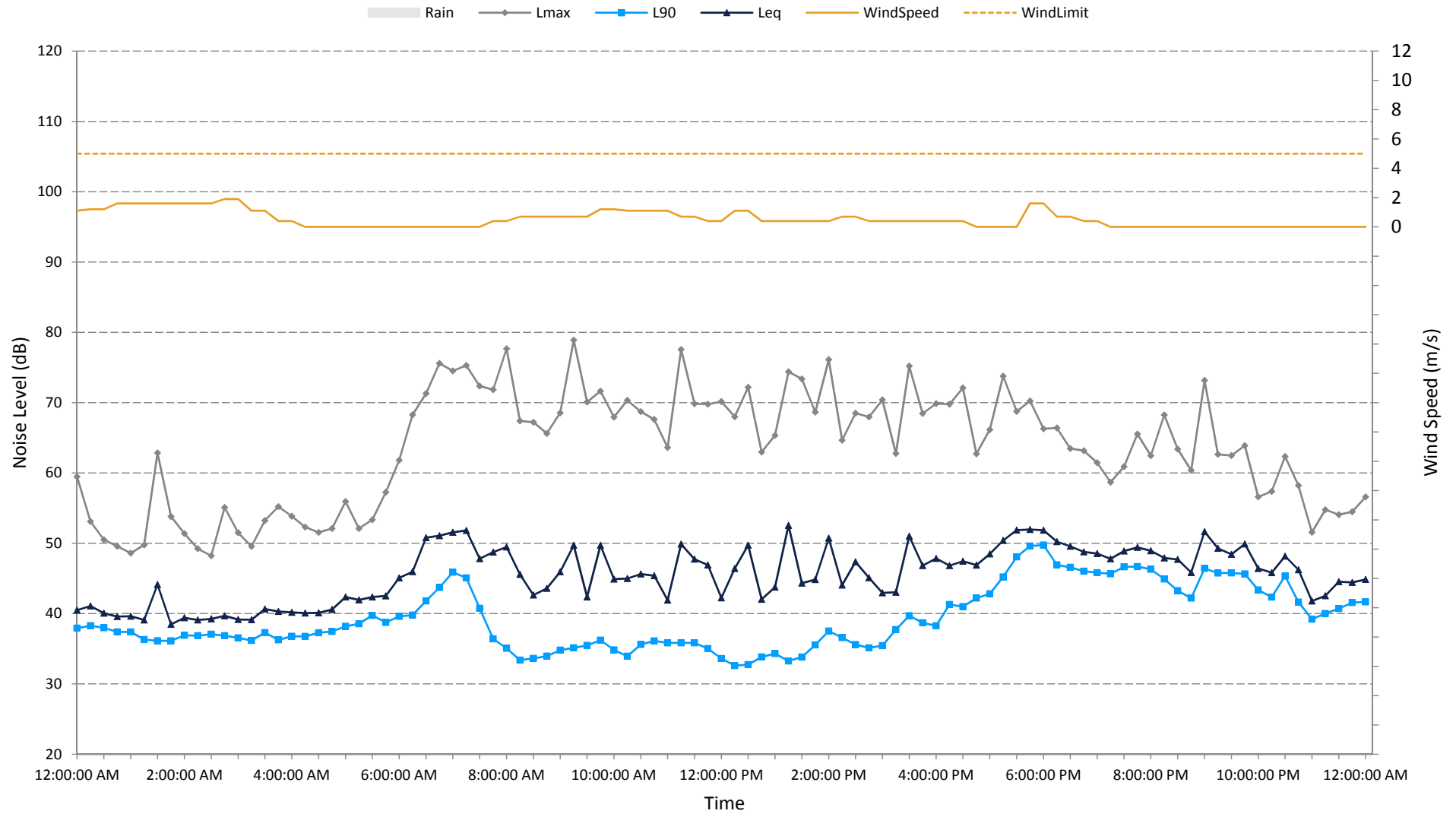
Measured ambient noise levels
8 Swamphen Street
Friday, 30-08-19



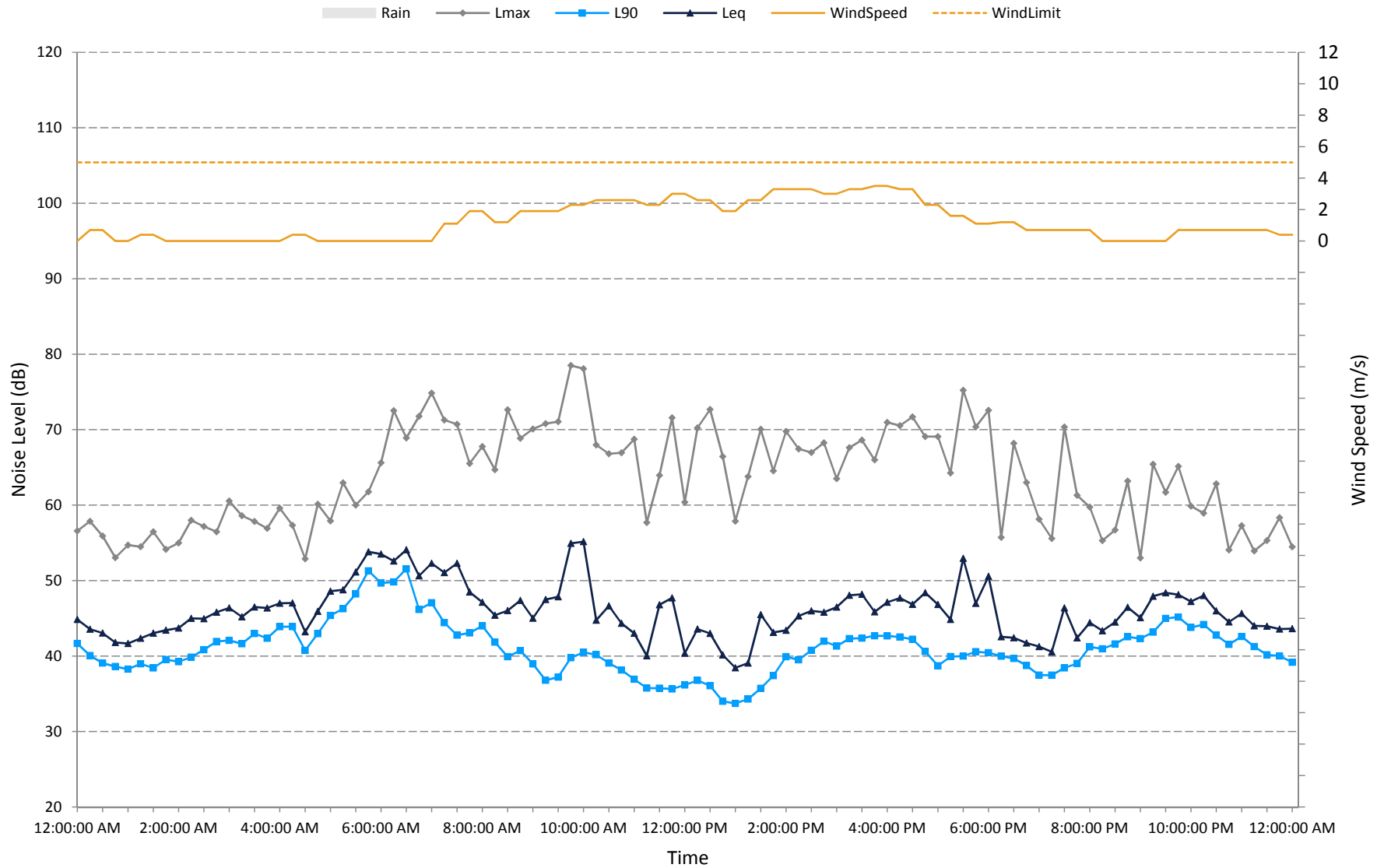
**Measured ambient noise levels
8 Swamphen Street
Saturday, 31-08-19**



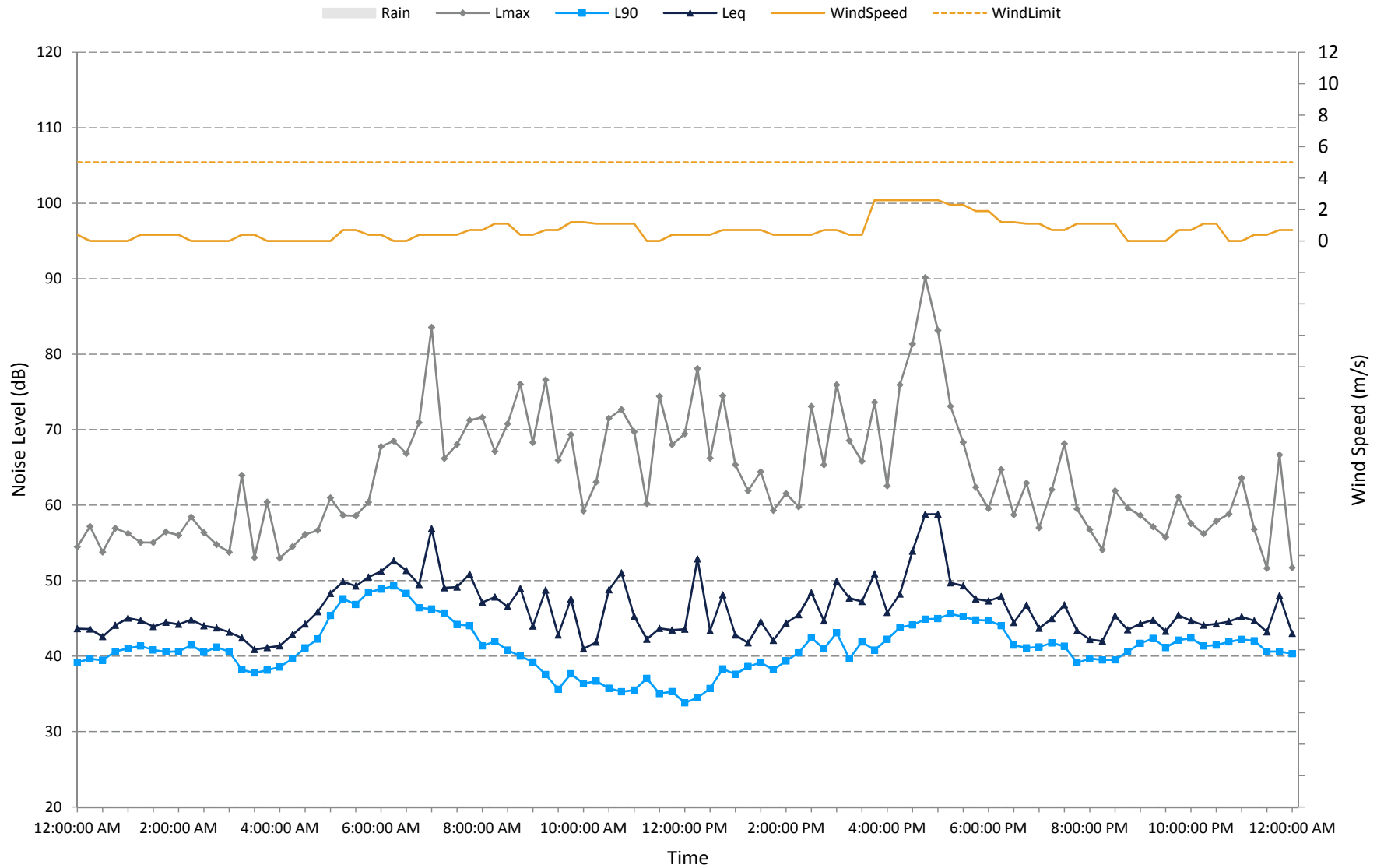
Measured ambient noise levels
8 Swamphen Street
Sunday, 01-09-19



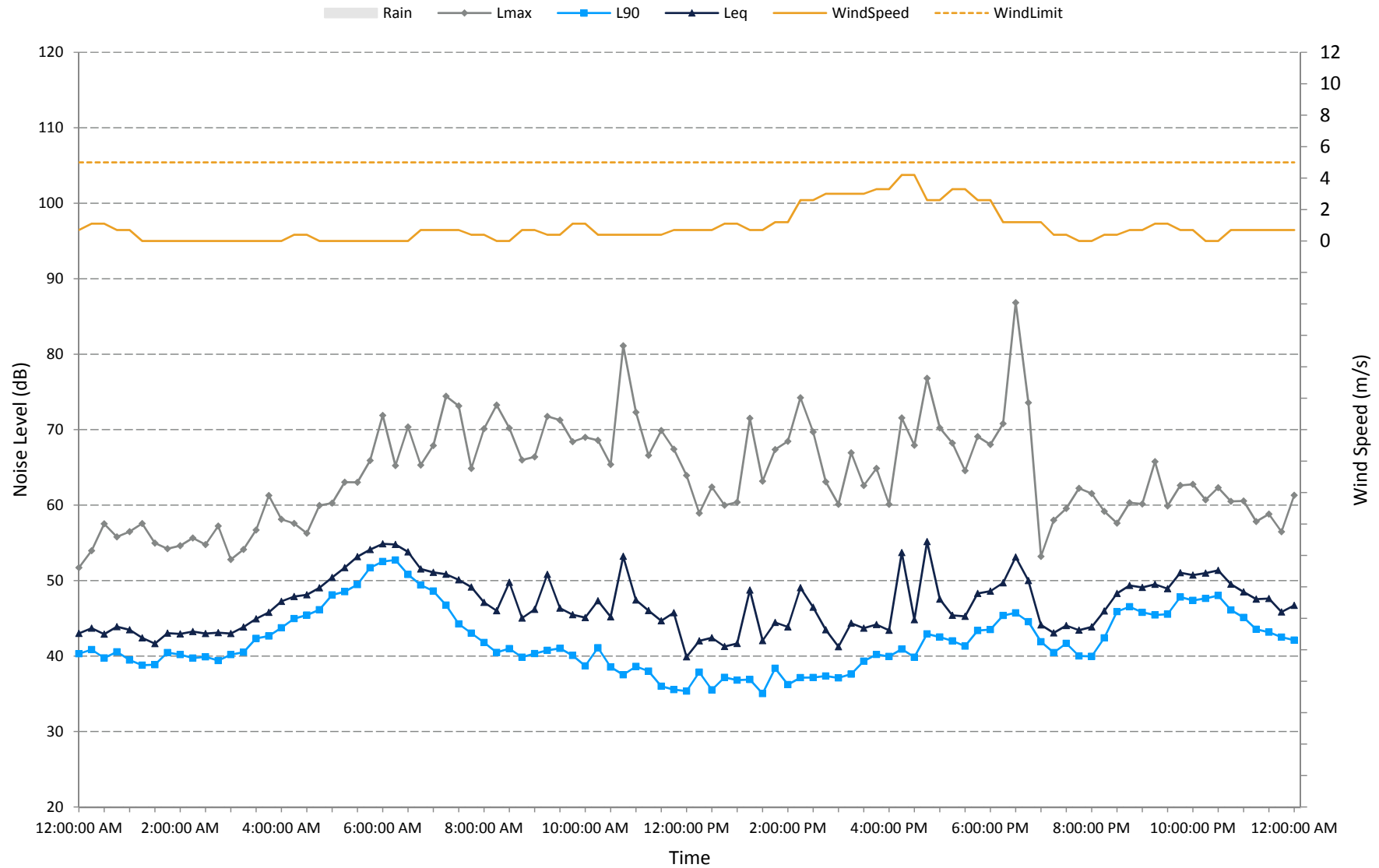
Measured ambient noise levels
8 Swamphen Street
Monday, 02-09-19



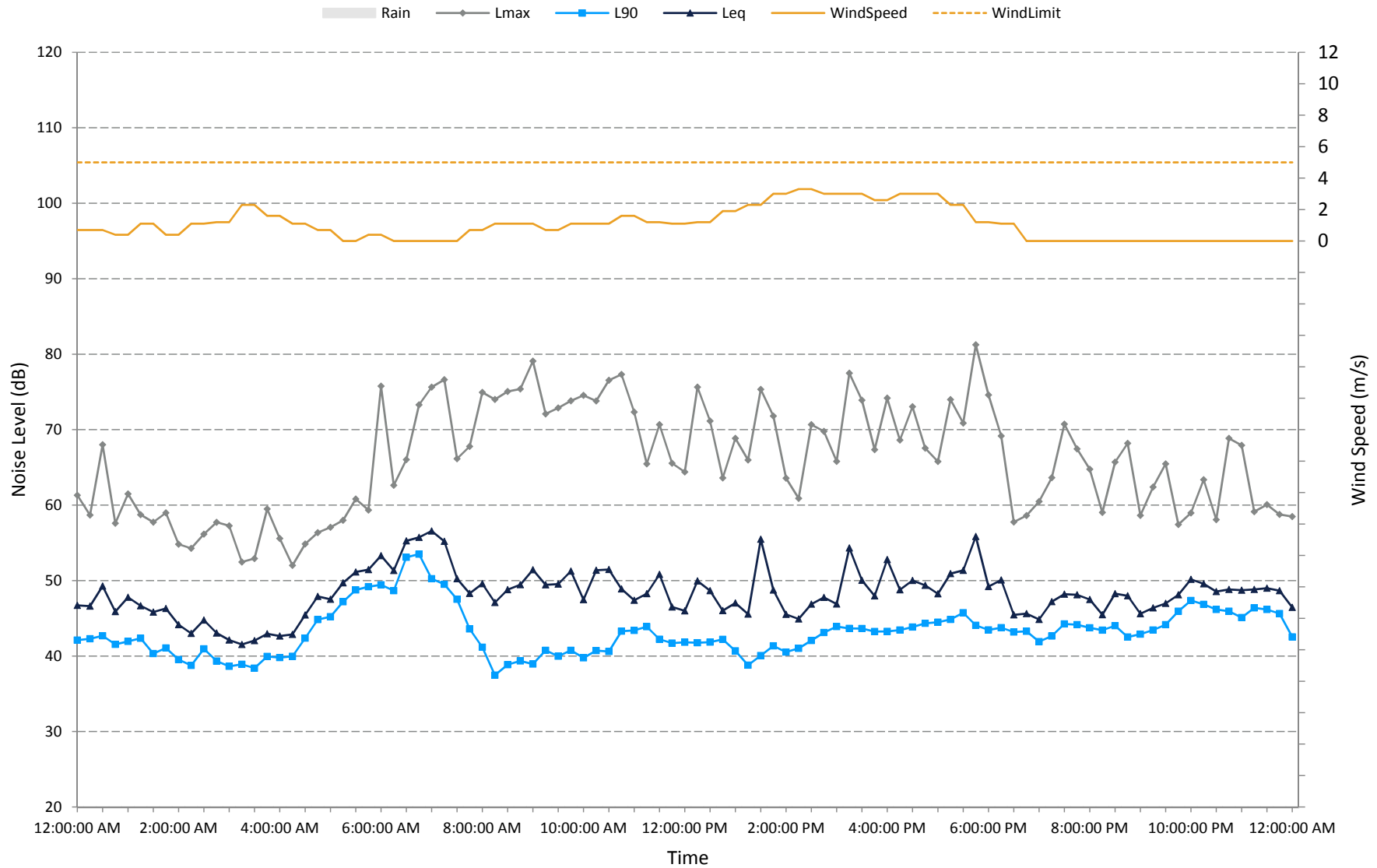
Measured ambient noise levels
8 Swamphen Street
Tuesday, 03-09-19



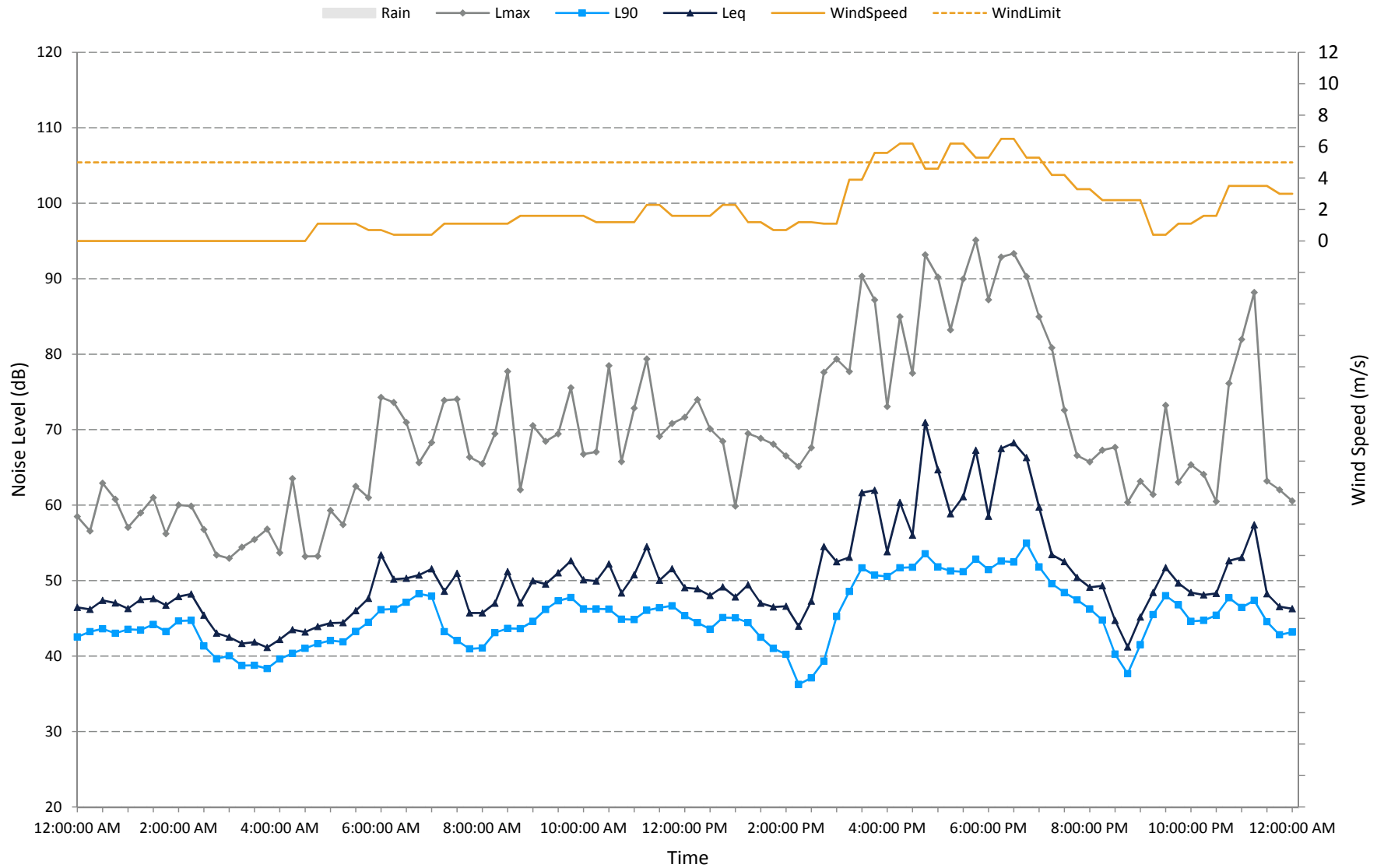
Measured ambient noise levels
8 Swamphen Street
Wednesday, 04-09-19



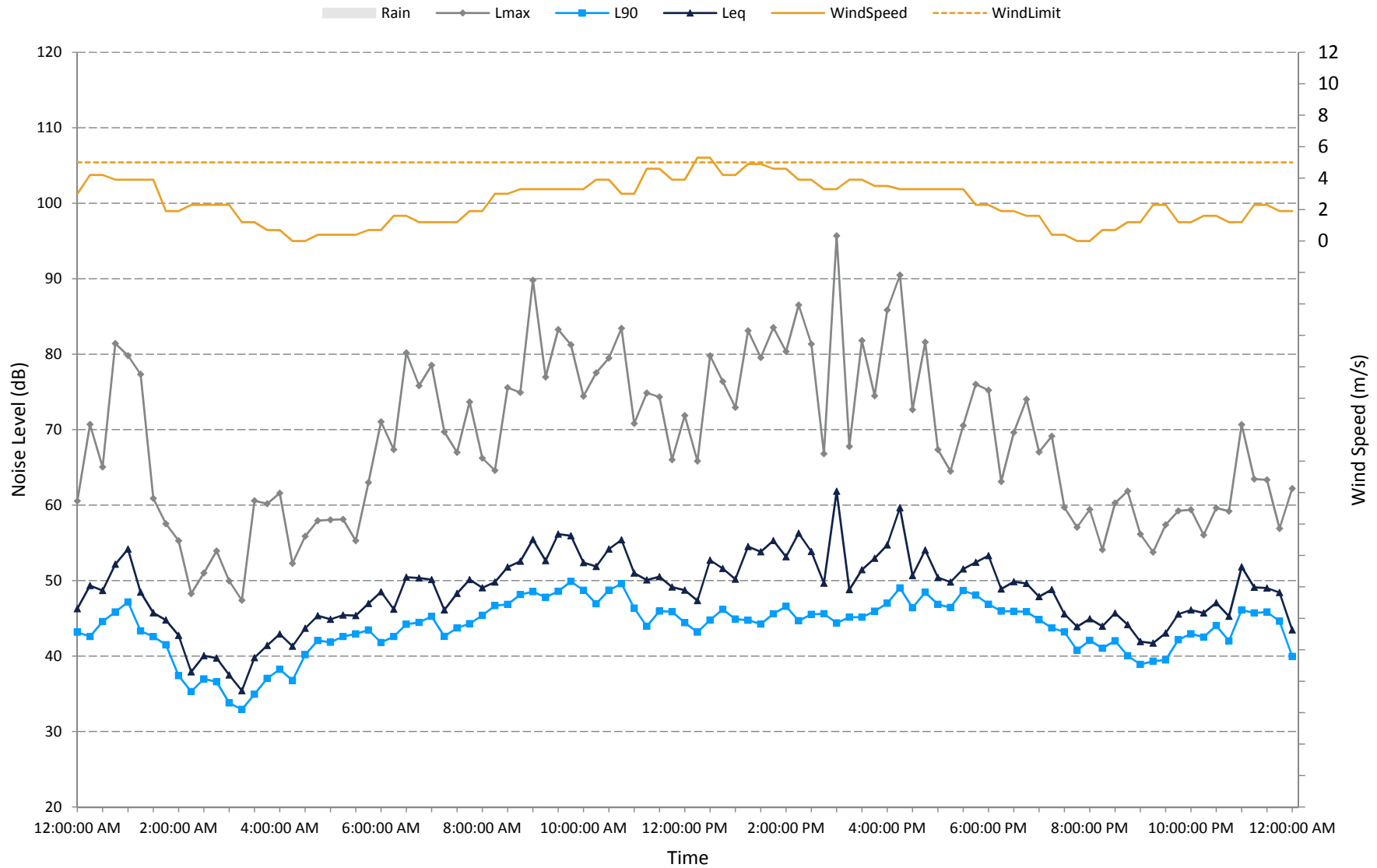
Measured ambient noise levels
8 Swamphen Street
Thursday, 05-09-19



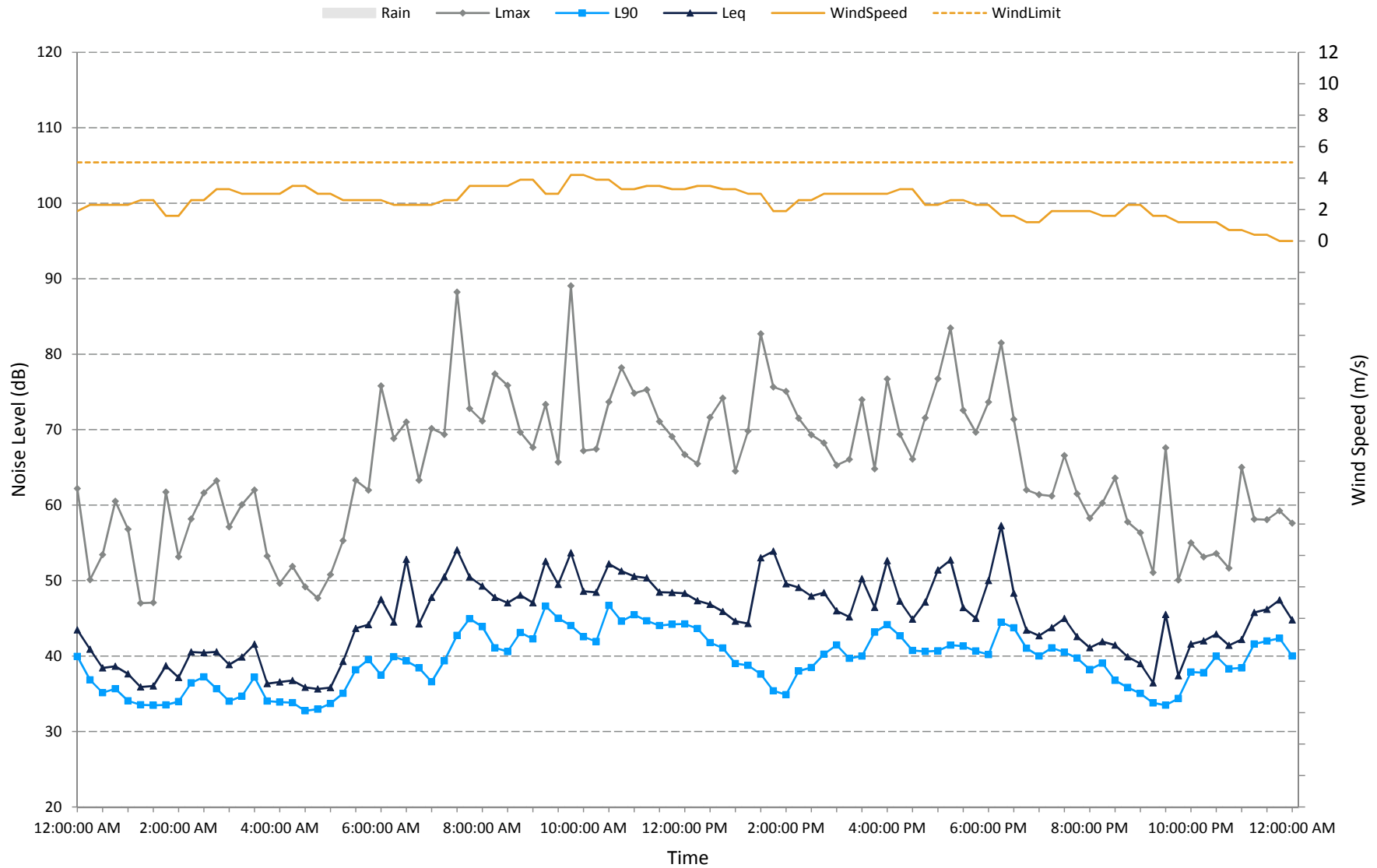
Measured ambient noise levels
8 Swamphen Street
Friday, 06-09-19



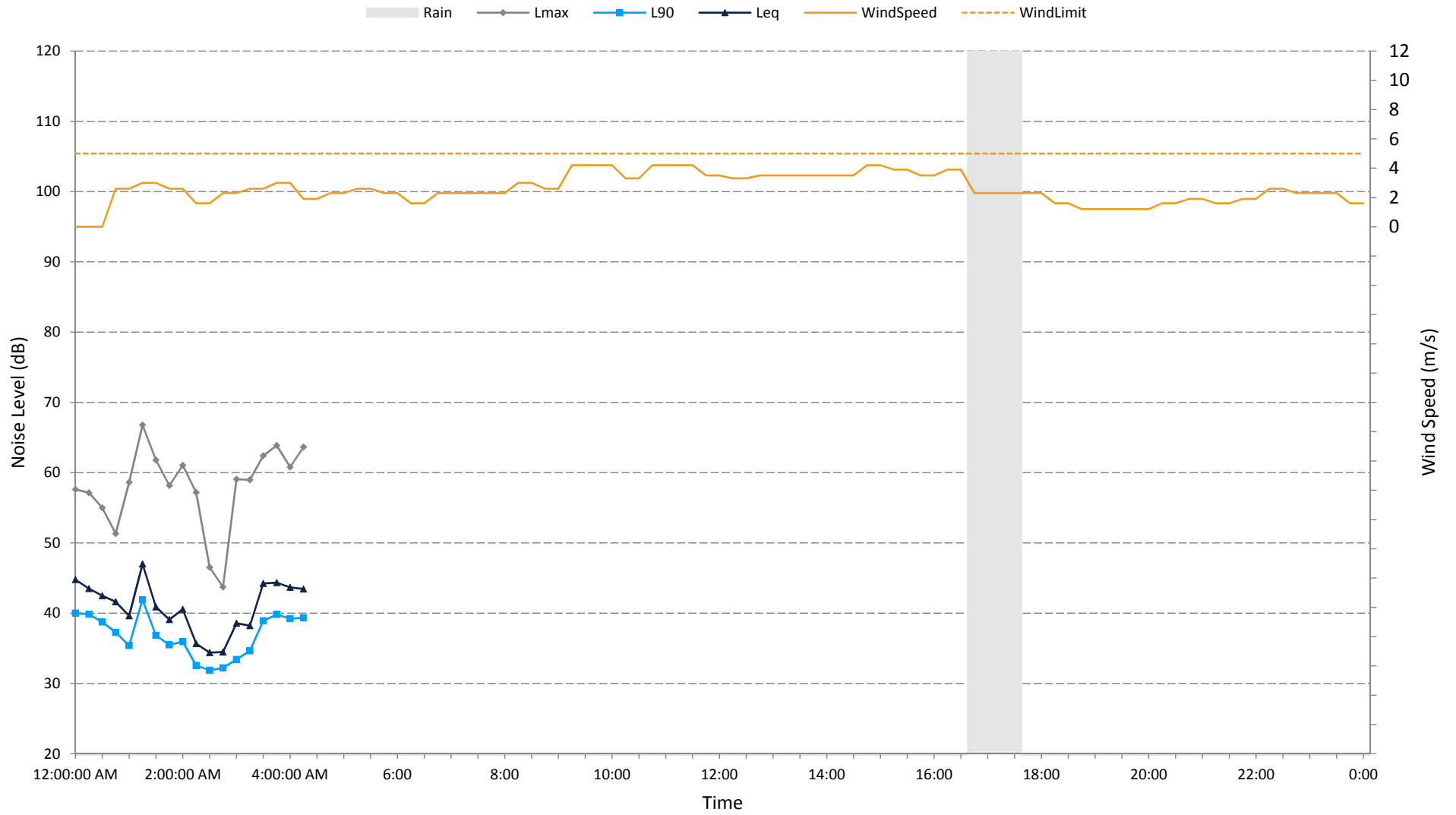
**Measured ambient noise levels
8 Swampphen Street
Saturday, 07-09-19**



Measured ambient noise levels
8 Swampfen Street
Sunday, 08-09-19



Measured ambient noise levels
8 Swamphen Street
Monday, 09-09-19



Appendix K

EPA letter (16 October 2019)



EPA Reference: DOC19/897253

Bianca Thornton
Environmental Assessment Officer
Department of Planning & Environment
Bianca.Thornton@planning.nsw.gov.au

Attention - Bianca Thornton

ELECTRONIC MAIL

16 October 2019

Dear Ms Thornton

RE: Genesis Waste Management Facility (MP 06_0139 MOD 6) – Further Comments

The NSW Environment Protection Authority refers to your request received on 30 September 2019 for the EPA to provide comments on the response from Bingo Industries Limited dated 26 September 2019 (the Response) in relation to the proposal for the Genesis Waste facility located at 1 Kangaroo Avenue, Eastern Creek NSW, operated by Dial-A-Dump (EC) Pty Ltd (the Proponent).

The EPA has reviewed the Response, which related to outstanding noise and air issues, and makes the following comments:

1. Noise

The EPA considers all the issues previously raised in EPA letter dated 20 August 2019 have been adequately addressed and has no further comments.

2. Air

The EPA considers all the issues previously raised in EPA letter dated 20 August 2019 have been adequately addressed except the issue regarding peak daily emissions. As previously raised in EPA Letter dated 15 November 2018 and EPA Letter dated 30 August 2019 to Department of Planning and Environment, the EPA recommends the Proponent undertake an assessment accounting for potential peak daily throughput to the landfill. If the Proponent does not undertake this assessment, the EPA recommends a condition of the consent as follows:

A maximum of 2,740 tonnes of material is permitted to be transported to the landfill by truck per day.

Please note that these comments are provided in addition to previous recommended conditions in EPA Letter dated 21 June 2019 (attached).

If you have any further questions regarding this matter, please contact Carla Thomas on (02) 9995 5302.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Lara Barrington'.

LARA BARRINGTON
Unit Head Waste Compliance
Environment Protection Authority
Attached: EPA Letter dated 21 June 2019

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Appendix L

Bingo letter (24 October 2019)

24 October 2019

NSW Department of Planning, Industry and Environment
Ms Bianca Thornton
Environmental Assessment Officer
320 Pitt Street
Sydney NSW

Dear Bianca

RE: Genesis Waste Management Facility – Modification 6 (MP 06_0139 Mod 6)

Bingo Industries (Bingo) has reviewed the letter submitted to the Department of Planning, Industry and Environment (DPIE) on 16 October 2019 by the Environment Protection Authority (EPA) in relation to our response submitted on 26 September 2019.

As requested by the EPA in their letter dated 16 October 2019, we have engaged EMM to undertake an assessment accounting for potential peak daily throughput to the landfill. The results of this assessment are attached (Attachment A). We have also met with the EPA on 23 October 2019 to discuss the issue and ensure that our assessment is consistent with their request.

We trust that the attached response adequately addresses the issues raised by the EPA and look forward to resolving this issue as quickly as possible. If you have any further queries in relation to our response, please do not hesitate to contact me.

Kind Regards



David Taylor
General Manager, Property & Infrastructure
0427 051 109

Attachments

Attachment A - Eastern Creek Mod 6_Response to EPA letter of 16 October_FINAL.pdf

Appendix M

EMM advice (22 October 2019)

22 October 2019

David Taylor
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Re: Genesis MOD6 - Response to additional NSW EPA comments

Dear David,

1 Introduction

A letter prepared by the NSW Environment Protection Authority (EPA) dated 16 October 2019 was received by Bingo Industries (Bingo) containing additional comments relating to the air quality impact assessment completed for Modification 6 of the Genesis Waste Management Facility (the facility).

The NSW EPA presented the following outstanding comment in relation to air quality impacts:

The EPA considers all the issues previously raised in EPA letter dated 20 August 2019 have been adequately addressed except the issue regarding peak daily emissions. As previously raised in EPA Letter dated 15 November 2018 and EPA Letter dated 30 August 2019 to Department of Planning and Environment, the EPA recommends the Proponent undertake an assessment accounting for potential peak daily throughput to the landfill. If the Proponent does not undertake this assessment, the EPA recommends a condition of the consent as follows:

A maximum of 2,740 tonnes of material is permitted to be transported to the landfill by truck per day.

The daily material limit of 2,740 tonnes per day (tpd) is equivalent to an annual tonnage of 1 million tonnes per annum (Mtpa), which is the proposed annual limit of material disposed to the landfill. Bingo have advised that while the maximum annual disposal rate to landfill would not exceed 1 Mtpa, the actual daily material disposal rate vary in response to market demand and could therefore exceed the proposed EPA limit of 2,740 tonnes per day on a small number of days throughout an operational year.

The dispersion modelling completed for the MOD6 air quality impact assessment (AQIA) was based on a landfill disposal rate of 1 Mtpa, or a rate of 2,740 tonnes per day. Based on historical operations at the facility, Bingo advises that a landfill disposal rate of 2,740 tonnes per day is representative of a typical day of operations at the site.

By comparison, Bingo considers that a peak day of landfill disposal operations is approximately 1.5 times higher than a typical day. For the purpose of this letter, a daily landfill disposal rate of 4,110 tpd is representative of a peak day at the facility. Bingo have advised that a peak day could occur between five and ten days per year, however it is reiterated that the daily landfill disposal rate is dependent on market demand.

A theoretical worst case day of landfill disposal operations is defined as a daily landfill disposal rate of 5,400 tpd at the facility. Bingo have advised that this rate is not likely to occur but has been included as a disposal rate scenario for the purpose of this letter.

To understand the implications of the above discussed variability in the daily landfill disposal rate, a frequency analysis of predicted concentrations has been undertaken.

2 Upscaling of predicted concentrations

As stated, the dispersion modelling completed in the MOD6 AQIA is based on a landfill disposal rate of 1 Mtpa, or an average of 2,740 tpd. To derive results equivalent to potential peak and worst case day operations, the following multiplicative factors have been applied to the daily varying PM₁₀ and PM_{2.5} concentrations predicted by the dispersion modelling conducted for MOD6 AQIA:

- for peak day operations, predicted concentrations have been increased by a factor of 1.5; and
- for theoretical worst case day operations, predicted concentrations have been increased by a factor of 2.

It is noted that the scaling factors listed above were applied to total predicted impacts at each of the surrounding sensitive receptor locations. This approach therefore assumes that the processing rate at the Material Processing Centre (MPC) is also increased by the same rate. While haulage emissions to the landfill represent the key contributing source at the neighbouring receptors, this upscaling across the entire site is considered highly conservative.

3 Frequency analysis of background air quality

All background concentrations from the onsite station (PM₁₀ only) and Department of Planning, Industry and Environment (DPIE) St Marys and Prospect stations that were referenced for the MOD6 AQIA were collated into a single dataset for each of PM₁₀ and PM_{2.5} (3,004 total data points for PM₁₀, 1,006 data points for PM_{2.5}). A frequency distribution for each of the background datasets was calculated and are illustrated in Figure 1 and Figure 2 for of PM₁₀ and PM_{2.5} respectively.

From this analysis, the PM₁₀ and PM_{2.5} monitoring data indicates that the local area typically experiences:

- two exceedances of the NSW EPA 24-hour PM₁₀ criteria of 50 µg/m³ per year; and
- four exceedances of the NSW EPA 24-hour PM_{2.5} criteria of 25 µg/m³ per year.

These background exceedance days are in general associated with regional scale events (dust storms, hazard reduction burns or bushfires). The collated background datasets have been used to undertake a cumulative concentration frequency analysis.

4 Frequency analysis of change in cumulative concentrations

To understand the implications of the typical (2,740 tpd), peak (4,110 tpd) and theoretical worst case (5,400 tpd) daily landfill disposal rates, a cumulative frequency analysis has been undertaken at each receptor location.

This analysis was completed by pairing all predicted 24-hour PM₁₀ and PM_{2.5} concentrations at each receptor location (366 predictions for 2016 modelling year) with all recorded background concentrations (as stated in Section 3, 3,004 total data points for PM₁₀, 1,006 data points for PM_{2.5}). Therefore, at each receptor location, there are 1,099,464 combinations of background and model predicted impacts for 24-hour PM₁₀ and 368,196 combinations of background and model predicted impacts for 24-hour PM_{2.5}. This process was repeated for the concentrations derived for each of the three highlighted daily landfill disposal rates (ie 2,740 tpd, 4,110 tpd and 5,400 tpd).

For each receptor and landfill disposal scenario, the frequency distribution of cumulative 24-hour PM₁₀ and PM_{2.5} concentrations were analysed. Of greatest significance was the potential change in cumulative days above the relevant NSW EPA criterion.

The change in potential cumulative days above the NSW EPA criterion of 24-hour average PM₁₀ and PM_{2.5} for 2,740 tpd, 4,110 tpd and 5,400 tpd landfill disposal rates is illustrated in Figure 3 and Figure 4 respectively. Primary focus in this report is given to typical day and peak day landfill disposal rates, however theoretical worst case is also provided for context on the potential extreme of analysis.

The graph for cumulative 24-hour average PM₁₀ (Figure 3) shows the following:

- across all residential receptors (R1 to R11), the potential for additional cumulative exceedances above existing background ranges from 0.4 additional days per year for a typical day (2,740 tpd) to 0.8 additional days per year for the peak day (4,110 tpd) in the worst case (receptors R5 and R8); and
- across adjacent industrial receptors (R12 to R17), the potential for additional cumulative exceedances above existing background ranges from 1.7 additional days per year for a typical day (2,740 tpd) to 5.6 additional days per year for the peak day (4,110 tpd) in the worst case (receptor R12).

The graph for cumulative 24-hour average PM_{2.5} (Figure 4) shows the following:

- across all residential receptors (R1 to R11), the potential for additional cumulative exceedances above existing background ranges from 0.6 additional days per year for a typical day (2,740 tpd) to 0.9 additional days per year for the peak day (4,110 tpd) in the worst case (receptors R5, R7 and R8); and
- across adjacent industrial receptors (R12 to R17), the potential for additional cumulative exceedances above existing background ranges from 1.1 additional days per year for a typical day (2,740 tpd) to 1.7 additional days per year for the peak day (4,110 tpd) in the worst case (receptor R12).

5 Coincidence of exceedance event and daily activity rate

The frequency of additional exceedance days presented in Section 4 assumes that the stated landfill disposal rate occurs continually. However, this assumption is only applicable for the typical day landfill disposal rate. Based on input from Bingo, representative peak day and theoretical worst case day landfill disposal rates are only anticipated between five to ten days (peak day) and once (theoretical worst case day) per year respectively, depending on market conditions.

The coincident occurrence of a specific daily landfill disposal rate with a potential criteria exceedance has been derived by the following:

$$\text{Likelihood of occurrence} = (\text{indicative days per year of landfill disposal rate} / 365) \times (\text{likelihood of additional cumulative criteria exceedance} / 365)$$

For each receptor and landfill disposal rate, the likelihood of additional exceedance day relative to existing background was calculated. The results of the calculations are presented in Figure 5 for PM₁₀ and Figure 6 for PM_{2.5}.

These figures show that for both PM₁₀ and PM_{2.5} cumulative concentrations, when the potential for additional cumulative concentrations above the NSW EPA impact assessment criteria for a specified landfill disposal rate is combined with the likely frequency of occurrence in 12 month period, the likelihood of cumulative criteria exceedance is very low across all receptors and all landfill disposal rates.

Indeed, the highest potential for additional exceedance day is associated with the typical day landfill disposal rate, with one additional potential exceedance day predicted at industrial receptors R12, R13 and R16 for 24-

hour average PM₁₀ and PM_{2.5}. This is due to the assumption that this rate could occur more often throughout a 12-month period than a peak day (five to 10 days) or a theoretical worst case day (single day).

6 Conclusions

The results presented in this report demonstrate that for all surrounding receptors, disposal of waste to the landfill at a representative peak day or theoretical worst case day rates would not significantly alter the potential for exceedance of the 24-hour average PM₁₀ or PM_{2.5} criterion at any of the surrounding receptors, relative to the modelling results for the typical day landfill disposal rates.

It is considered that the use of reactive management measures (trigger response alarms, real-time monitoring and a reactive air quality management plan) would assist with the control of potential cumulative exceedance days, irrespective of the landfill disposal rate that occurs on any given day. It is noted that the development of proactive and reactive management strategies was a recommended condition of consent from the NSW EPA in a letter dated 21 June 2019.

Yours sincerely



Scott Fishwick

Associate - National Technical Leader, Air Quality

sfishwick@emmconsulting.com.au

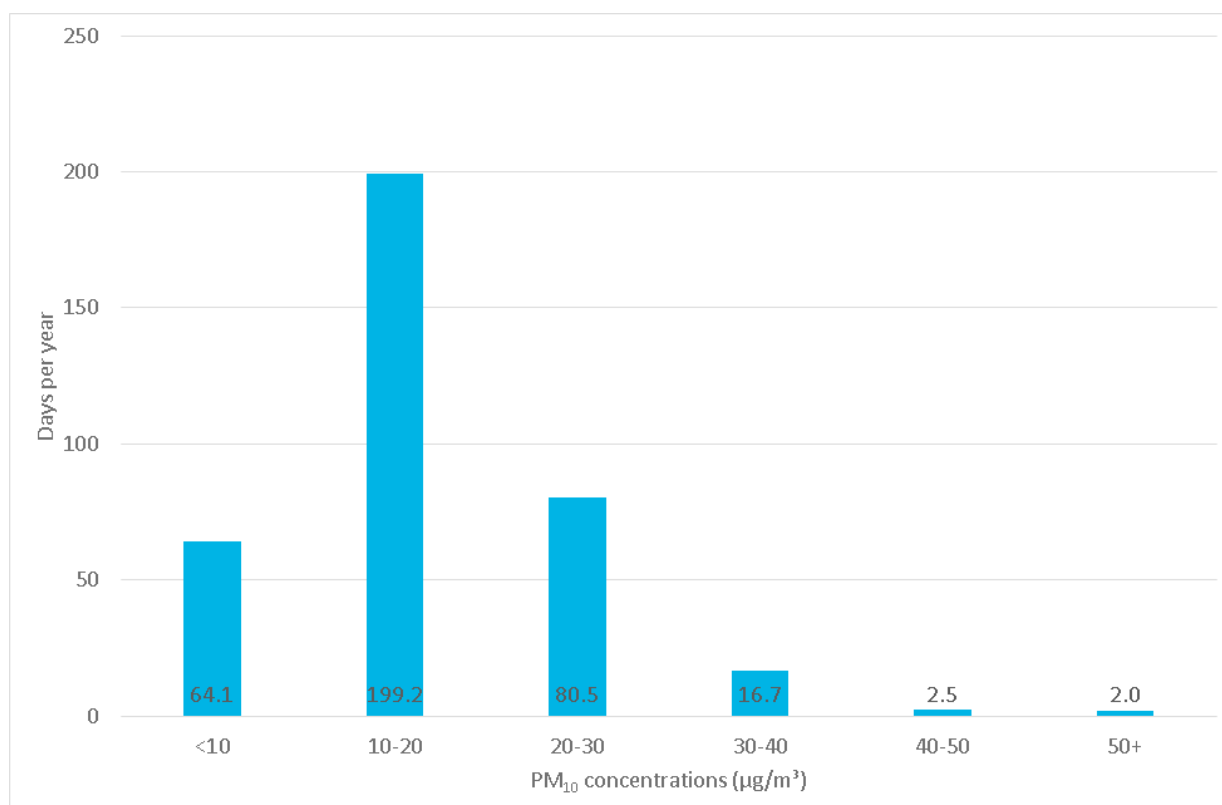


Figure 1 Frequency distribution of collated 24-hour average PM₁₀ concentrations

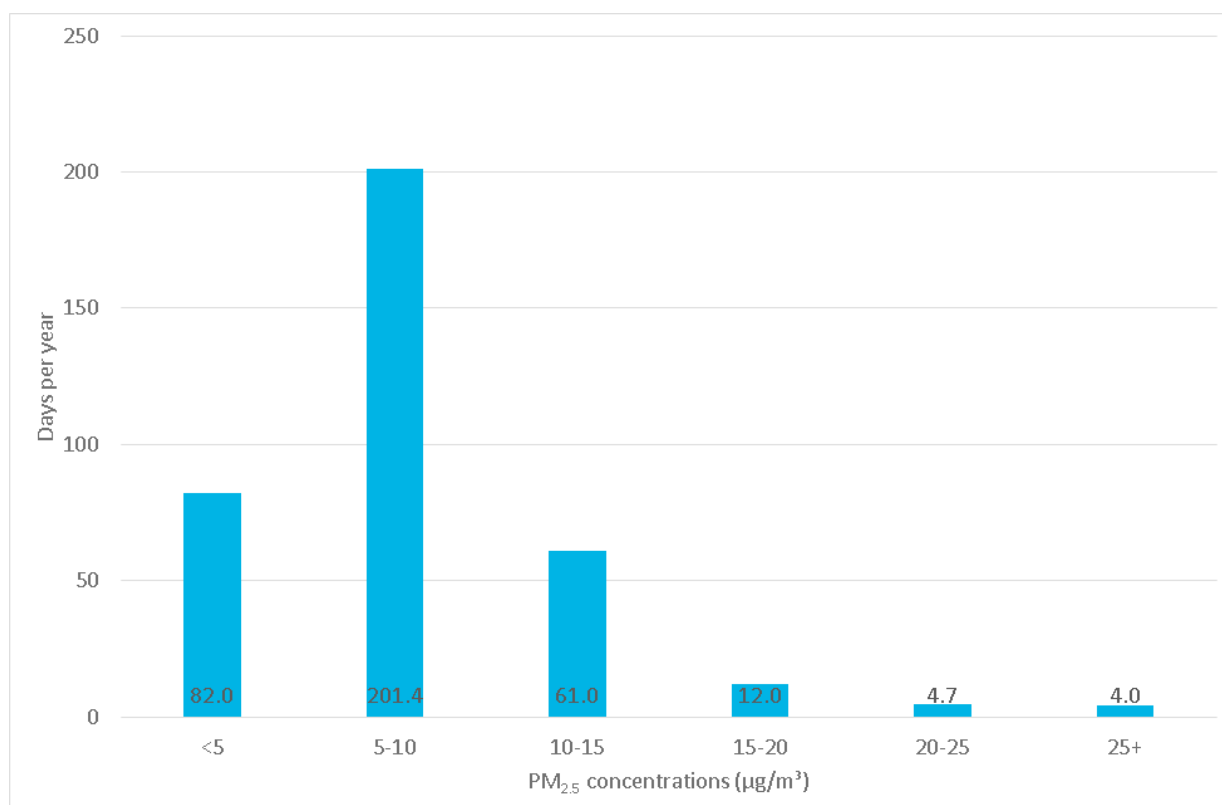


Figure 2 Frequency distribution of collated 24-hour average PM_{2.5} concentrations

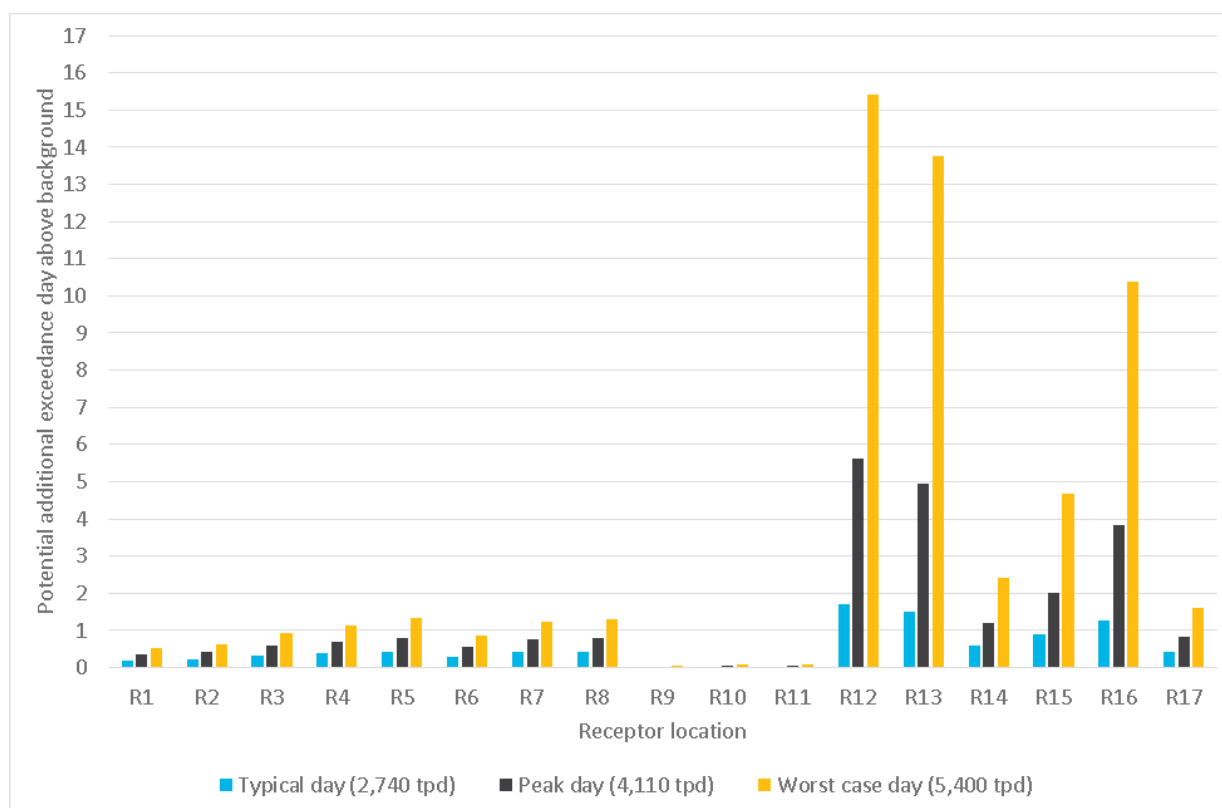


Figure 3 Number of additional exceedance days above background – continual landfill disposal rate assumed - 24-hour average PM₁₀

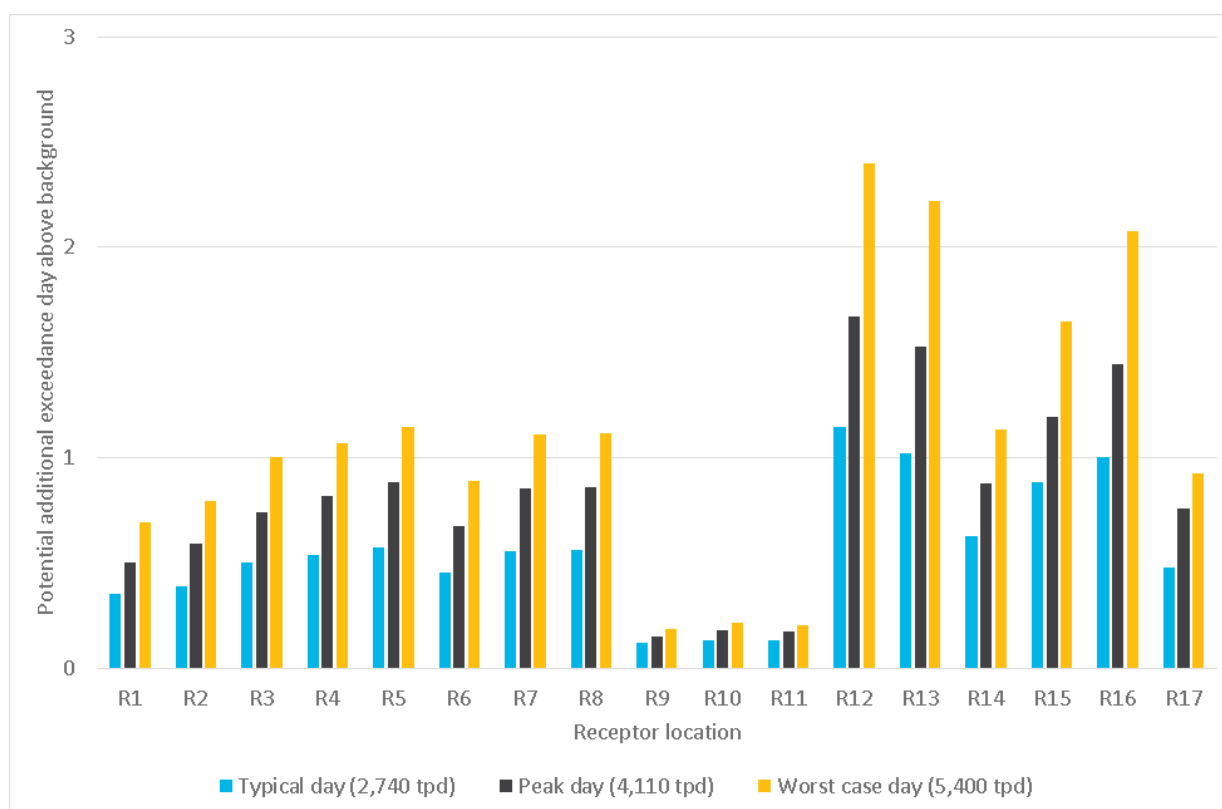


Figure 4 Number of additional exceedance days above background – continual landfill disposal rate assumed - 24-hour average PM_{2.5}

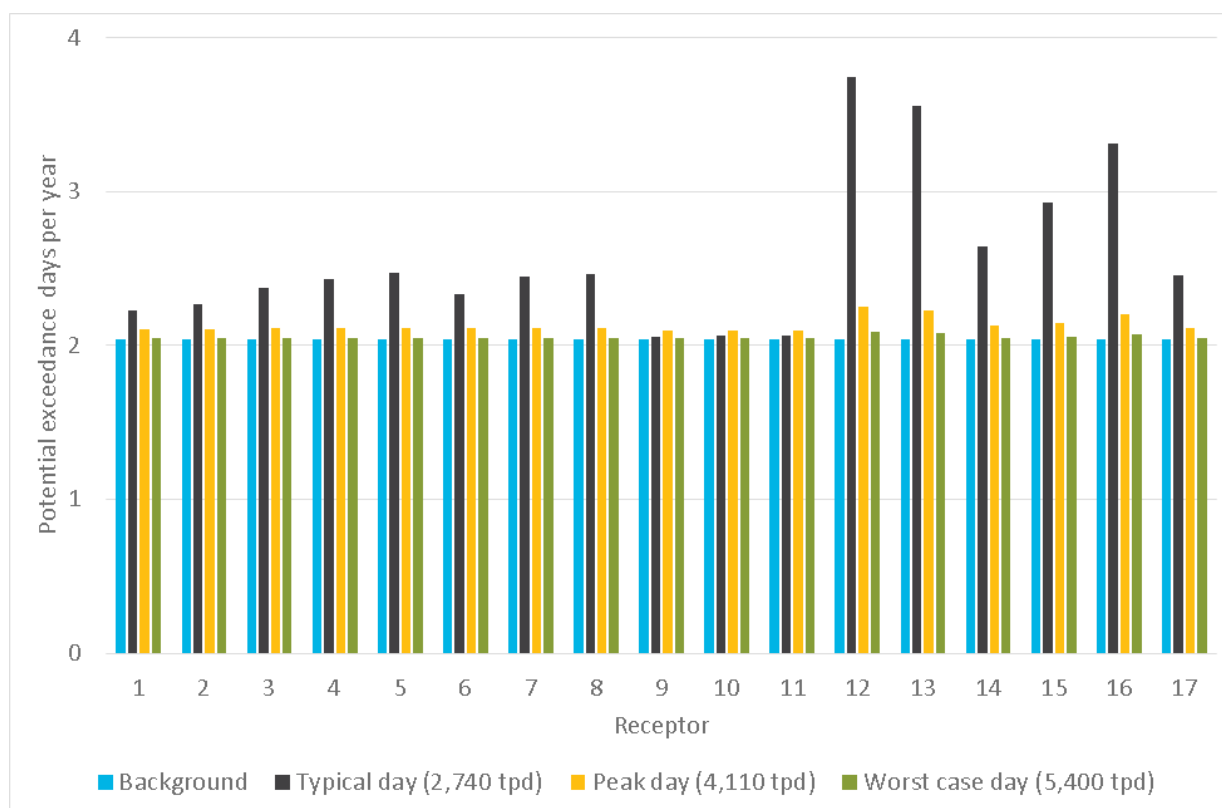


Figure 5 Frequency of cumulative concentrations greater than 24-hour average PM₁₀ criterion

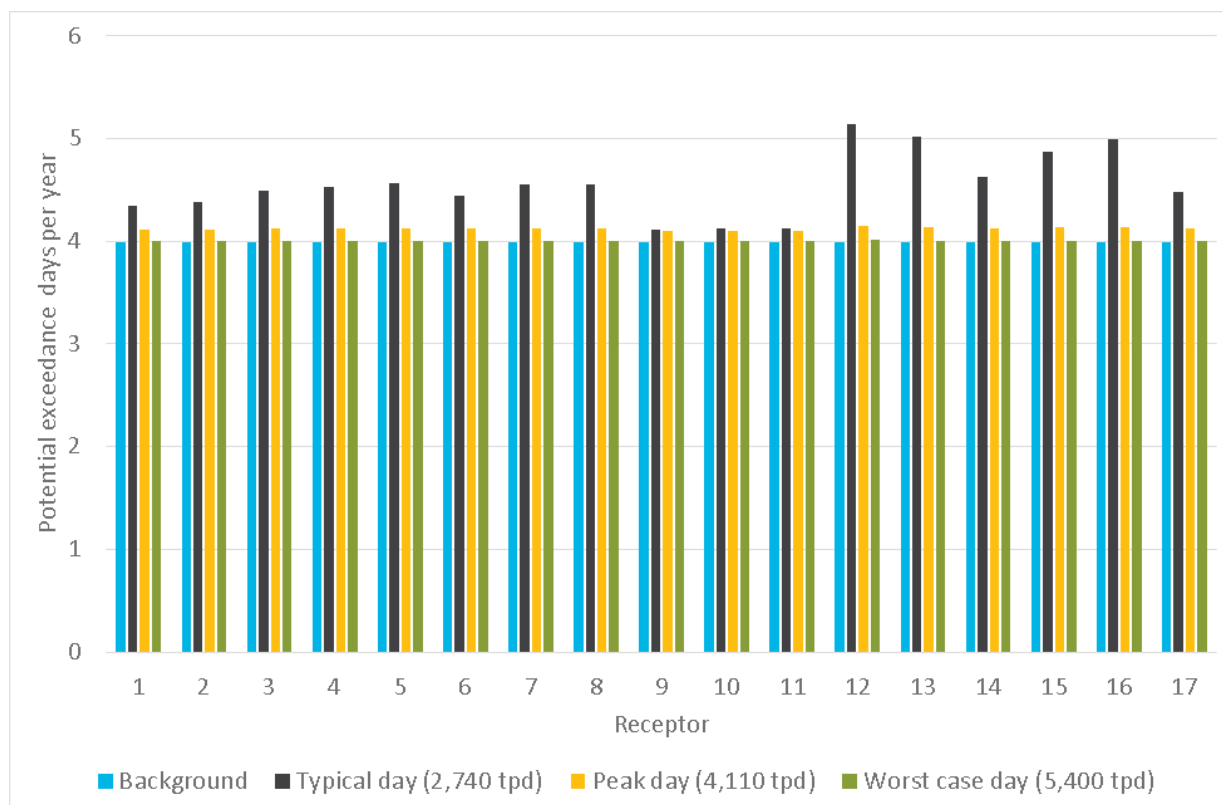


Figure 6 Frequency of cumulative concentrations greater than 24-hour average PM_{2.5} criterion

Appendix N

EPA letter (8 November 2019)



EPA Reference: DOC19/928159-4

Ms Bianca Thornton
Environmental Assessment Officer
Department of Planning & Environment
Bianca.Thornton@planning.nsw.gov.au

Attention - Bianca Thornton

ELECTRONIC MAIL

8 November 2019

Dear Ms Thornton

RE: Genesis Waste Management Facility (MP 06_0139 MOD 6) – Further Comments

The NSW Environment Protection Authority (EPA) refers to the recent additional information received on 24 October 2019 including a letter from Bingo Industries (Bingo) dated 24 October 2019 and a document titled "Genesis MOD6 - Response to additional NSW EPA comments" dated 22 October 2019.

The EPA has reviewed the additional information provided and makes the following comments:

- The additional information adequately addresses the residual issue of assessing peak daily throughputs to the landfill. As such, the EPA does not recommend a daily cap on throughput of waste to the landfill as previously stated in EPA letter dated 16 October 2019.
- Acknowledgment that Bingo has committed to boundary air monitoring to inform reactive management measures including relocation of the existing ambient air monitoring station to a boundary location adjacent to the neighbouring industrial receptor, such that reactive management measures can be used to minimise the potential for adverse impacts from site operations
- The largest particulate matter emission sources associated with the proposal is haul roads. Assessed haul road emissions assume a high control efficiency (90%). On that basis it is unlikely that additional reactive measures for minimising haul road emissions would be able to be implemented, other than ceasing particular operations when boundary monitoring results show significant changes in particulate matter concentrations. Given the predicted exceedances of particle impact assessment criteria, the EPA recommends the proponent investigate additional proactive emission control measures, including sealing of all internal haul roads.

If you have any further questions regarding this matter, please contact Carla Thomas on (02) 9995 5302.

Yours sincerely

A handwritten signature in black ink, appearing to be 'L. Barrington', with a stylized loop at the end.

LARA BARRINGTON
Unit Head Waste Compliance
Environment Protection Authority



