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Shoalhaven Hospital Redevelopment

Dust Monitoring Report 12

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TABLE OF CONTENTS

1 INTRODUCTION

This report presents the results of dust monitoring conducted by Acoustic Logic for the Shoalhaven Hospital Redevelopment project site. Details presented in this report include monitoring locations, relevant project objectives, measured levels over the monitoring period and discussion of results.

This report presents the results of monitoring for the month of May between 1/5/2024 and 31/5/2024. Monitoring has been ongoing since 29th May 2023.

This report should be read in conjunction with the Construction Noise, Dust and Vibration Management Sub Plan prepared by this office (ref: 20230220.1/0506A/R1/VF, dated 05/06/2023)

2 SITE DESCRIPTION

The project site is located at Shoalhaven Hospital Redevelopment. Bulk excavation works and concrete pours are currently being undertaken across the project site.

2.1.1 Surrounding Receivers

Based on site investigations, the following developments surround the site:

Table 1 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Detached dwellings to south of North Street, and residences and St Michaels Catholic Church and school to the east.
R2	Residential	Detached dwellings to north east, opposite Shoalhaven Street with some health and commercial and recreational uses.
PS	School	Shoalhaven Community Pre-School (future relocated site).
CC	Hospital	Cancer Centre overnight accommodation (part of the greater hospital site).

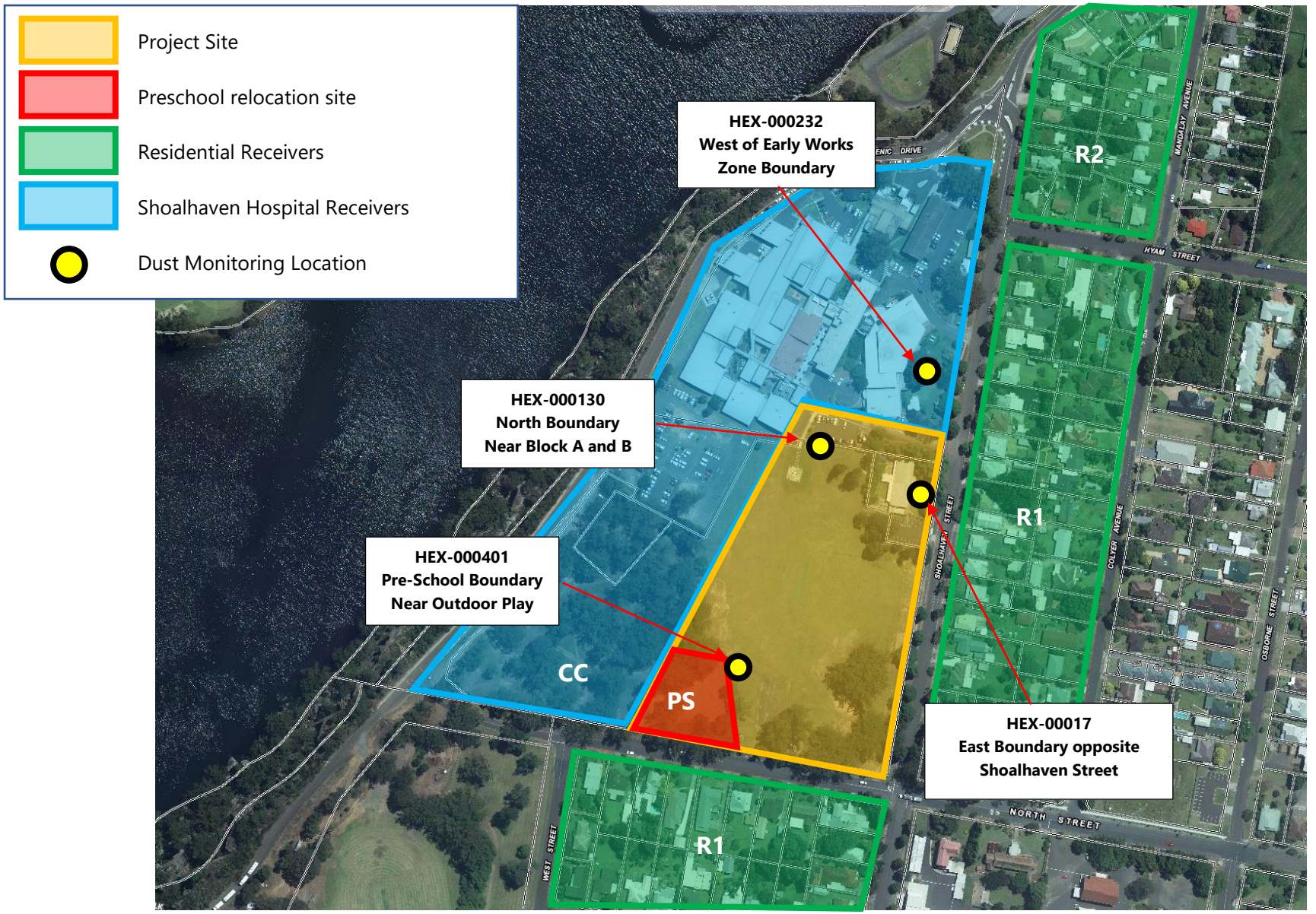

Figure 1 – Site Map. Monitoring Locations and Surrounding Receivers

3 MONITORING LOCATIONS AND DESCRIPTION

Refer to Figure 1 and photos below for monitoring locations.

Figure 2 – HEX000171 –-East Boundary Opposite Shoalhaven Street (left) and HEX000131 – North Boundary Near Block A and B (right)

Figure 3 – HEX000232 – West of Early Works Zone Near Block A

Figure 4 – HEX000401 – Pre-School Boundary Fence Near Outdoor Play Area

3.1 MONITORING PERIOD

This report presents the results of monitoring between 1/5/2024 and 31/5/2024.

Monitoring has been ongoing since 29th May 2023.

3.2 MONITORING EQUIPMENT

Dust monitoring was conducted using SiteHive Hexanode monitors. Monitors are programmed to continuously store noise data over every 15-minute period

4 DUST MONITORING

4.1 PROJECT DOCUMENTATION

Construction impacts to nearby development have been determined in the Construction Noise, Dust and Vibration Management Sub Plan (ref: 20230220.1/0506A/R1/VF, dated 05/06/2023)

4.1.1 Dust Management Levels

Dust monitoring is conducted to measure mechanically generated respirable PM_{10} dust particles (< 10µm) and $PM_{2.5}$ dust particles (< 2.5µm), which are generally understood to be the main health concern in airborne dust. The air quality limits are based on the standards outlined in Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure* and NSW EPA's air quality categories.

It should be noted that the dust monitoring results can be influenced by events such as fires, fogs and dust storms, thus the PM10 limit has an allowance of 5 days per year to account for the effects of these two effects. It is noted that site dust suppression systems using fine water sprays can affect the dust count of laser-based measurement systems and so too can pollen in Spring. The PM_{10} and $PM_{2.5}$ goals are summarised below.

Table 2 – PM_{10} and $PM_{2.5}$ Goals (24-Hour Average)

Pollutant	Averaging Time	Maximum Concentration
Particulate Matter PM_{10}	24 hours	50 µg/m^3
Particulate Matter $PM_{2.5}$	24 hours	25 µg/m^3

The EPA has air quality categories based on particle concentration over a one-hour average. These levels may be used to control site dust emissions. Typically, a project alert trigger level is set on the 'Poor' category level. **However, the assessment level is based on the 24-hour average**.

Table 3 – PM_{10} and $PM_{2.5}$ Goals (1-Hour Average)

Pollutant	Air Quality Category (AQC)				
	Good	Fair	Poor	Very Poor	Extremely Poor
Particulate Matter PM_{10} (µg/m^3)	< 50	50-100	**100-200**	200-600	600 and above
Particulate Matter $PM_{2.5}$ (µg/m^3)	< 25	25-50	**50-100**	100-300	300 and above

4.2 MONITORED DUST LEVELS

The following legend has been generated with reference to exceedances within the monitored dust levels as follows and applied to the tables below.

RED = TRUE EXCEEDANCE

BLUE = EXCEEDANCES DURING WEATHER AFFECTED PERIODS

GREY = EXCEEDANCES DURING OUT OF HOURS

Where true exceedances are recorded, additional analysis has been provided in the discussion below.

4.2.1 East Boundary Facing Shoalhaven Street (Monitor HEX-000171)

The daily average $PM_{2.5}$ and PM_{10} concentration levels are presented below:

Table 4 – East Boundary (HEX-000171) Daily Average PM_{10} and $PM_{2.5}$ Concentration

Date	24hr Average $PM_{2.5}$ and PM_{10} Concentration					
	$PM_{2.5}$ Level ($\mu g/m^3$)	$PM_{2.5}$ Limit ($\mu g/m^3$)	Compliance	PM_{10} Level ($\mu g/m^3$)	PM_{10} Limit ($\mu g/m^3$)	Compliance
1/05/2024	5	25	Yes	31	50	Yes
2/05/2024	4		Yes	15		Yes
3/05/2024	5		Yes	20		Yes
4/05/2024	2		Yes	8		Yes
5/05/2024	5		Yes	17		Yes
6/05/2024	5		Yes	19		Yes
7/05/2024	3		Yes	13		Yes
8/05/2024	2		Yes	8		Yes
9/05/2024	2		Yes	12		Yes
10/05/2024	4		Yes	18		Yes
11/05/2024	3		Yes	14		Yes
12/05/2024	6		Yes	24		Yes
13/05/2024	6		Yes	24		Yes
14/05/2024	6		Yes	29		Yes
15/05/2024	9		Yes	35		Yes
16/05/2024	-		Yes	-		Yes
17/05/2024	12		Yes	49		Yes
18/05/2024	7		Yes	22		Yes
19/05/2024	5		Yes	18		Yes
20/05/2024	5		Yes	26		Yes
21/05/2024	3		Yes	23		Yes
22/05/2024	5		Yes	43		Yes
23/05/2024	6		Yes	39		Yes
24/05/2024	7		Yes	38		Yes
25/05/2024	5		Yes	21		Yes
26/05/2024	4		Yes	15		Yes
27/05/2024	7		Yes	35		Yes
28/05/2024	9		Yes	**58**		**No**
29/05/2024	-		Yes	-		Yes
30/05/2024	9		Yes	47		Yes
31/05/2024	7		Yes	43		Yes

RED = TRUE EXCEEDANCE
BLUE = COMPLIES - EXCEEDANCES DURING WEATHER AFFECTED PERIODS
GREY = COMPLIES - EXCEEDANCES DURING OUT OF HOURS

4.2.2 North Boundary Facing Block A & B (Monitor HEX-000130)

The daily average $PM_{2.5}$ and PM_{10} concentration levels are presented below:

Table 5 – North Boundary (HEX-000130) Daily Average PM_{10} and $PM_{2.5}$ Concentration

Date	24hr Average $PM_{2.5}$ and PM_{10} Concentration					
	$PM_{2.5}$ Level ($\mu g/m^3$)	$PM_{2.5}$ Limit ($\mu g/m^3$)	Compliance	PM_{10} Level ($\mu g/m^3$)	PM_{10} Limit ($\mu g/m^3$)	Compliance
1/05/2024	2	25	Yes	8	50	Yes
2/05/2024	2		Yes	4		Yes
3/05/2024	2		Yes	4		Yes
4/05/2024	1		Yes	2		Yes
5/05/2024	2		Yes	5		Yes
6/05/2024	2		Yes	4		Yes
7/05/2024	1		Yes	3		Yes
8/05/2024	1		Yes	2		Yes
9/05/2024	1		Yes	3		Yes
10/05/2024	1		Yes	4		Yes
11/05/2024	1		Yes	4		Yes
12/05/2024	2		Yes	7		Yes
13/05/2024	2		Yes	6		Yes
14/05/2024	2		Yes	6		Yes
15/05/2024	2		Yes	9		Yes
16/05/2024	2		Yes	6		Yes
17/05/2024	3		Yes	7		Yes
18/05/2024	2		Yes	5		Yes
19/05/2024	2		Yes	3		Yes
20/05/2024	2		Yes	5		Yes
21/05/2024	1		Yes	4		Yes
22/05/2024	1		Yes	4		Yes
23/05/2024	1		Yes	4		Yes
24/05/2024	1		Yes	5		Yes
25/05/2024	2		Yes	3		Yes
26/05/2024	1		Yes	2		Yes
27/05/2024	2		Yes	5		Yes
28/05/2024	2		Yes	6		Yes
29/05/2024	2		Yes	7		Yes
30/05/2024	2		Yes	5		Yes
31/05/2024	1		Yes	5		Yes

RED = TRUE EXCEEDANCE
BLUE = COMPLIES - EXCEEDANCES DURING WEATHER AFFECTED PERIODS
GREY = COMPLIES - EXCEEDANCES DURING OUT OF HOURS

4.2.3 West of Early Works Zone (Monitor HEX-000232)

The daily average $PM_{2.5}$ and PM_{10} concentration levels are presented below:

Table 6 – West of Early Works (HEX-000232) Daily Average PM_{10} and $PM_{2.5}$ Concentration

Date	24hr Average $PM_{2.5}$ and PM_{10} Concentration					
	$PM_{2.5}$ Level (µg/m³)	$PM_{2.5}$ Limit (µg/m³)	Compliance	PM_{10} Level (µg/m³)	PM_{10} Limit (µg/m³)	Compliance
1/05/2024	4	25	Yes	18	50	Yes
2/05/2024	2		Yes	9		Yes
3/05/2024	4		Yes	12		Yes
4/05/2024	2		Yes	6		Yes
5/05/2024	3		Yes	11		Yes
6/05/2024	4		Yes	12		Yes
7/05/2024	2		Yes	8		Yes
8/05/2024	1		Yes	5		Yes
9/05/2024	2		Yes	9		Yes
10/05/2024	3		Yes	12		Yes
11/05/2024	2		Yes	9		Yes
12/05/2024	3		Yes	15		Yes
13/05/2024	4		Yes	15		Yes
14/05/2024	4		Yes	17		Yes
15/05/2024	5		Yes	21		Yes
16/05/2024	4		Yes	19		Yes
17/05/2024	4		Yes	21		Yes
18/05/2024	4		Yes	14		Yes
19/05/2024	3		Yes	8		Yes
20/05/2024	3		Yes	15		Yes
21/05/2024	2		Yes	16		Yes
22/05/2024	2		Yes	15		Yes
23/05/2024	2		Yes	13		Yes
24/05/2024	3		Yes	16		Yes
25/05/2024	3		Yes	11		Yes
26/05/2024	2		Yes	6		Yes
27/05/2024	2		Yes	14		Yes
28/05/2024	3		Yes	20		Yes
29/05/2024	-		-	-		-
30/05/2024	3		Yes	16		Yes
31/05/2024	2		Yes	12		Yes

RED = TRUE EXCEEDANCE
BLUE = COMPLIES - EXCEEDANCES DURING WEATHER AFFECTED PERIODS
GREY = COMPLIES - EXCEEDANCES DURING OUT OF HOURS

4.2.4 Pre-School Boundary (Monitor HEX-000401)

The daily average $PM_{2.5}$ and PM_{10} concentration levels are presented below:

Table 7 – Pre-School Boundary (HEX-000401) Daily Average PM_{10} and $PM_{2.5}$ Concentration

Date	24hr Average $PM_{2.5}$ and PM_{10} Concentration					
	$PM_{2.5}$ Level (µg/m³)	$PM_{2.5}$ Limit (µg/m³)	Compliance	PM_{10} Level (µg/m³)	PM_{10} Limit (µg/m³)	Compliance
1/05/2024	3	25	Yes	26	50	Yes
2/05/2024	2		Yes	5		Yes
3/05/2024	3		Yes	9		Yes
4/05/2024	1		Yes	4		Yes
5/05/2024	2		Yes	10		Yes
6/05/2024	3		Yes	12		Yes
7/05/2024	2		Yes	7		Yes
8/05/2024	1		Yes	4		Yes
9/05/2024	1		Yes	6		Yes
10/05/2024	2		Yes	10		Yes
11/05/2024	1		Yes	8		Yes
12/05/2024	3		Yes	14		Yes
13/05/2024	3		Yes	16		Yes
14/05/2024	3		Yes	15		Yes
15/05/2024	5		Yes	22		Yes
16/05/2024	3		Yes	14		Yes
17/05/2024	3		Yes	13		Yes
18/05/2024	4		Yes	11		Yes
19/05/2024	3		Yes	8		Yes
20/05/2024	3		Yes	16		Yes
21/05/2024	3		Yes	20		Yes
22/05/2024	2		Yes	16		Yes
23/05/2024	2		Yes	16		Yes
24/05/2024	2		Yes	17		Yes
25/05/2024	2		Yes	9		Yes
26/05/2024	2		Yes	5		Yes
27/05/2024	3		Yes	18		Yes
28/05/2024	3		Yes	21		Yes
29/05/2024	3		Yes	24		Yes
30/05/2024	3		Yes	29		Yes
31/05/2024	3		Yes	22		Yes

RED = TRUE EXCEEDANCE
BLUE = COMPLIES - EXCEEDANCES DURING WEATHER AFFECTED PERIODS
GREY = COMPLIES - EXCEEDANCES DURING OUT OF HOURS

4.3 DISCUSSION

4.3.1 East Boundary Opposite Shoalhaven Street Residences (HEX-000171)

- During the monitoring period, $PM_{2.5}$ dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM_{10} dust levels at the monitoring location were generally found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- True exceedances of the daily average occurred on the following dates and categories:
    - 28th May - PM_{10}
        - The dust level averaged over the 24-hour period was above the recommended level on this date.

4.3.2 North Boundary Near Block A and B (HEX-000130)

- During the monitoring period, $PM_{2.5}$ dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM_{10} dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.

4.3.3 West of Early Works Zone Near Block A (HEX-000232)

- During the monitoring period, $PM_{2.5}$ dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM_{10} dust levels at the monitoring location were generally found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.

4.3.4 Pre-School Boundary Near Outdoor Play Area (HEX-000401)

- During the monitoring period, $PM_{2.5}$ dust levels at the monitoring location were found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.
- During the monitoring period, PM_{10} dust levels at the monitoring location were generally found to be within the maximum concentration permitted by Department of the Environment's *National Environment Protection (Ambient Air Quality) Measure*.

4.4 MANAGEMENT OF DUST LEVELS

General Notes:

- It should be noted that the measured dust levels will also be affected by meteorological events outside the project site, such as heavy rain and wind, high humidity, dust storms, bush fires, high pollen count and the like.

Response to Exceedances

The response procedures adopted by JH are as follows:

- The project team is notified via SMS alert messages when hourly average dust levels are exceeded
- Methodology and works across the project site and near to the specific monitoring location are recorded.
- Where monitoring locations are confirmed to be potentially impacted by the adjacent works (i.e., where exceedance notifications are received but no works are occurring near to the monitoring location – indicating alerts are as a result of external impacts – refer general notes in Section 4.3.4), work methodology was investigated and mistor(s) are deployed.

Acoustic Logic confirms JH has implemented best practices as well as reasonable and feasible mitigation measures in response to dust exceedances over the majority of this monitoring period.

A review of works on the days that led to exceedance of dust levels should be carried out and the following additional recommendations for ongoing dust management should be implemented:

- Loose soil and/or dusty stockpiles should be covered with tarpaulin/plastic sheeting outside of working hours and during extended periods where not in use.
- Minimisation/relocation of stockpiles away from dust-sensitive receivers to minimise potential for disturbance due to prevailing winds.
- Additional dust suppression methods such as directed water sprays directly onto excavation equipment and work areas should be implemented where alternative methodology cannot be found.

5 CONCLUSION

Dust monitoring has been conducted at different locations for the between 1/5/2024 and 31/5/2024.For this monitoring period, we note the following:

- Hexanode HEX-000171 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.
- Hexanode HEX-000130 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.
- Hexanode HEX-000232 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.
- Hexanode HEX-000401 at the monitoring location $PM_{2.5}$ and PM_{10} dust levels were generally within the criteria during this monitoring period.

On dates where exceedances have occurred, these have been documented for further review and remedial action for JH review.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Pty Ltd
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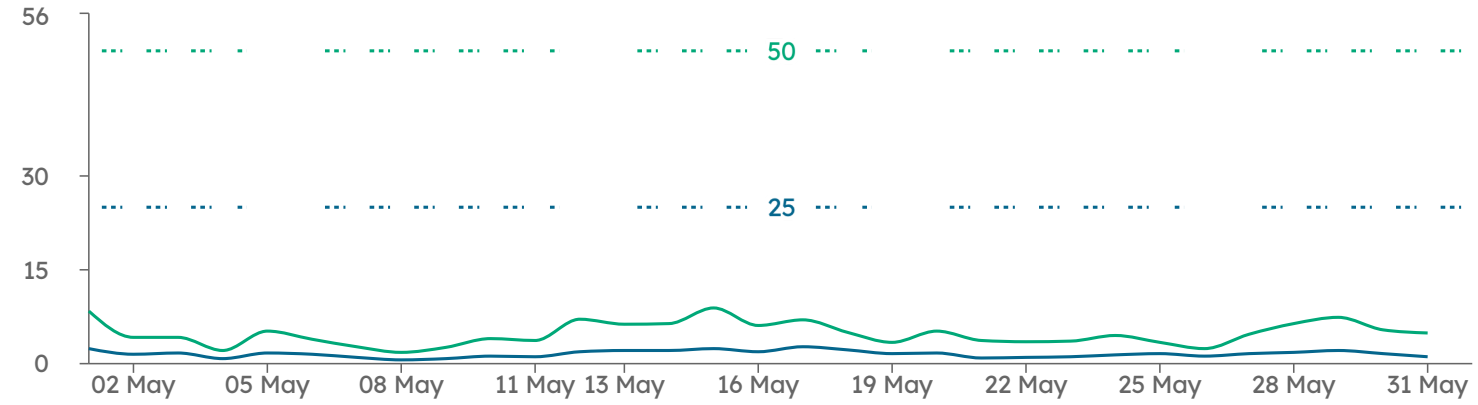
APPENDIX A – DUST MONITORING GRAPHS

Dust Monitoring Graphs

North Boundary Near Block A and B

01 May 2024 - 31 May 2024

µg/m³ 1d averages



Parameters

PM2.5

PM10

Thresholds

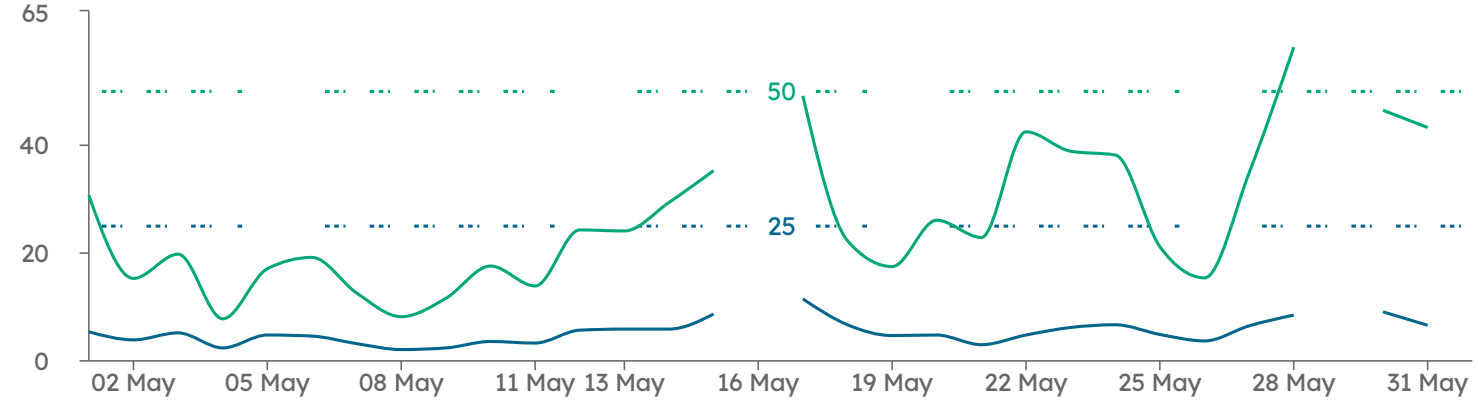
25 Acoustic Logic DAILY PM2.5 Threshold of 25µg/m³ (Poor Air Quality)

50 Acoustic Logic DAILY PM10 Threshold of 50µg/m³ (Poor Air Quality)

East Boundary Near Shoalhaven Street

01 May 2024 - 31 May 2024

µg/m³ 1d averages



Parameters

PM2.5

PM10

Thresholds

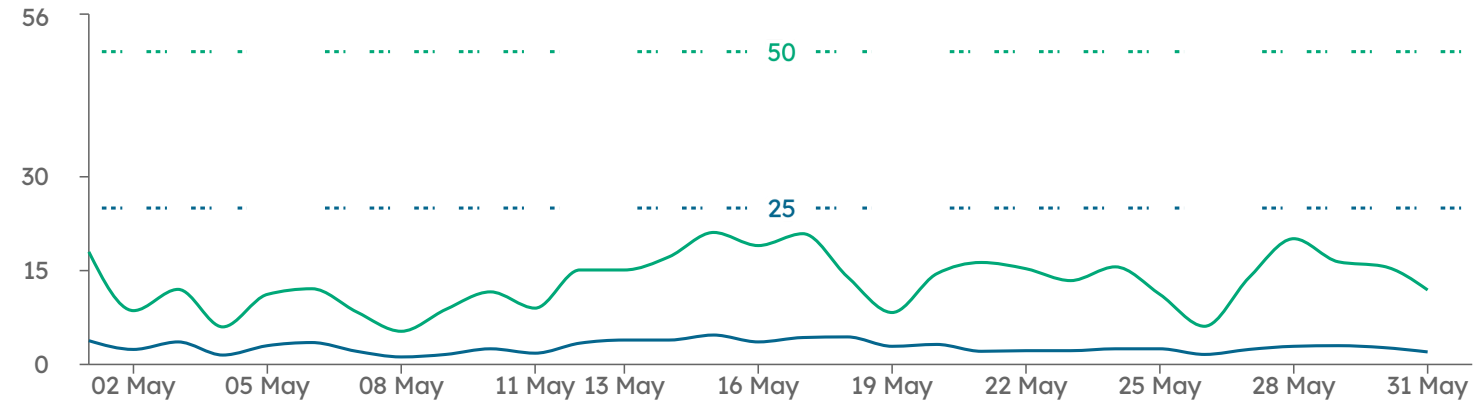
25 Acoustic Logic DAILY PM2.5 Threshold of 25µg/m³ (Poor Air Quality)

50 Acoustic Logic DAILY PM10 Threshold of 50µg/m³ (Poor Air Quality)

West of Early Works Zone

01 May 2024 - 31 May 2024

µg/m³ 1d averages



Parameters

PM2.5

PM10

Thresholds

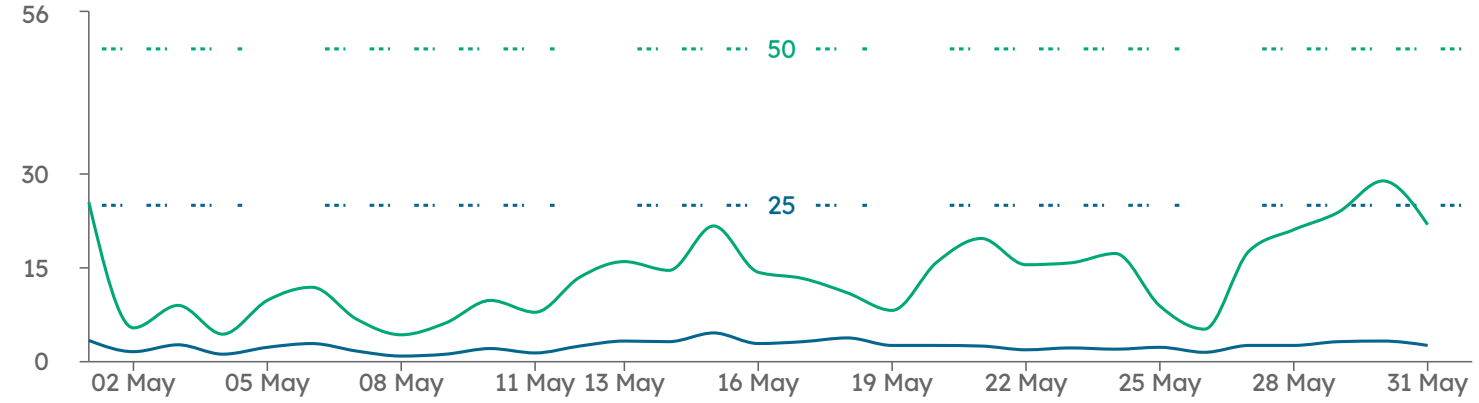
25 Acoustic Logic DAILY PM2.5 Threshold of 25µg/m³ (Poor Air Quality)

50 Acoustic Logic DAILY PM10 Threshold of 50µg/m³ (Poor Air Quality)

Near Pre-School

01 May 2024 - 31 May 2024

µg/m³ 1d averages



Parameters

PM2.5

PM10

Thresholds

25 Acoustic Logic DAILY PM2.5 Threshold of 25µg/m³ (Poor Air Quality)

50 Acoustic Logic DAILY PM10 Threshold of 50µg/m³ (Poor Air Quality)

Device Details

Device Serial	Monitoring Points	Model	Calibration Date	Calibration Due
HEX-000171	East Boundary Near Shoalhaven Street	SiteHive Hexanode	03 Apr 2023	03 Apr 2025
HEX-000130	North Boundary Near Block A and B	SiteHive Hexanode	21 Apr 2023	21 Apr 2025
HEX-000232	West of Early Works Zone	SiteHive Hexanode	29 May 2023	29 May 2025
HEX-000401	Near Pre-School	SiteHive Hexanode	28 Aug 2023	28 Aug 2025