

1 July 2023

To whom it may concern,

**RE: Dust Monitoring – June 2023**

As part of SSD Approval 39170713 Conditions B15, C19 & C20, BESIX Watpac are to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures. To meet the requirements of above conditions, weekly monitoring for dust has occurred. The results for monitoring during June 2023 can be found within.

Yours sincerely,



**Mark Cahalin**  
Senior Project Manager  
BESIX Watpac



**PARAGON**  
ENGINEERING

## **CONSTRUCTION NOISE AND VIBRATION REPORT**

Client:  
**MOITS PTY LTD**

**Stage 3 St. George Hospital,  
16 Kensington Street,  
Kogarah**



Monitoring Period:  
02 June 2023 to 08 June 2023

29 June 2023  
Ref: PAR-23661- DM04[A]



# DUST MONITORING REPORT

## Stage 3 St. George Hospital

### 16 Kensington St, Kogarah

For Duration:  
02 June 2023 – 08 June 2023

Prepared for:  
Peter Zwamborn  
**MOITS PTY LTD**  
142 Wicks Rd, Macquarie Park NSW 2113

### Document Authorization

For and on behalf of Paragon Engineering

**Michael Duong**, BEng  
Civil Engineer

**Omar Al-Kubaisi**, MSc (Honors)  
Senior Structural Engineer

### Quality information

#### Revision history

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A	1 <sup>st</sup> Revision	29 June 2023	MD	OA

#### Distribution

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## Executive Summary

Paragon Engineering was commissioned by MOITS PTY LTD to provide dust monitoring services during the excavation and shoring activities for the development site located at St. George Hospital. The project comprises of excavation and construction of a new medical facility with two basement carpark.

This report provides weekly dust monitoring information for the excavation works of the above site.

Two dust monitor was installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function.

Dust data was assessed against the criteria from the EPA document titled "Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales". Based on the EPA criteria, the daily maximum concentration for this site was set to **25 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>2.5</sub>) and **50 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>10</sub>).

The dust monitoring results found on Table 3 and Table 4 summarise the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations recorded and compared to the criteria set for this project. The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria except on one occasion where there was an exceedance from Monitor 1 on 03/06/2023. Further monitoring is recommended, and dust controls should be implemented to minimise the impact on the surrounding residents.

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## 1. Introduction

### 1.1 Background

Paragon Engineering was commissioned by MOITS PTY LTD to provide dust monitoring services during the demolition, excavation and shoring activities for the development site located at St. George Hospital.

### 1.2 Site Information

The project is located at St. George Hospital. The Stage 3 redevelopment includes the piling, excavation and construction of a new Medical facility with two basement carpark. The nearest dust sensitive receivers are shown in *Figure 1*.

#### Working Hours

The Project construction working hours shall be in accordance with approved DA Condition C4-C8 as described below:

Activity	Permitted working hours
C4. Construction including the delivery of materials to and from site:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 7:00am to 6:00pm inclusive</li> <li>❖ Saturday - 8:00am to 1:00 pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>
C5. Notwithstanding condition C4, provide noise levels do not exceed the existing background level plus 5dB, work may also be undertaken during the following hours:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 6:00am to 7:00pm inclusive</li> <li>❖ Saturday - 1:00pm to 5:00 pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>
C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 if Required:	<ul style="list-style-type: none"> <li>❖ By the police or a public authority for the delivery of vehicles, plant or materials; or</li> <li>❖ In an emergency to avoid the loss of life, damage to property or to prevent environment harm; or</li> <li>❖ Where the works are inaudible at the nearest sensitive receivers; or</li> <li>❖ For the delivery, set-up and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or</li> <li>❖ Where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works</li> </ul>
C7. Notification of such construction activities as referenced in Condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	
C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 9:00am to 12:00pm</li> <li>❖ Monday to Friday - 2:00pm to 5:00 pm</li> <li>❖ Saturday – 9:00am to 12:00pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>

## 1.3 Objectives

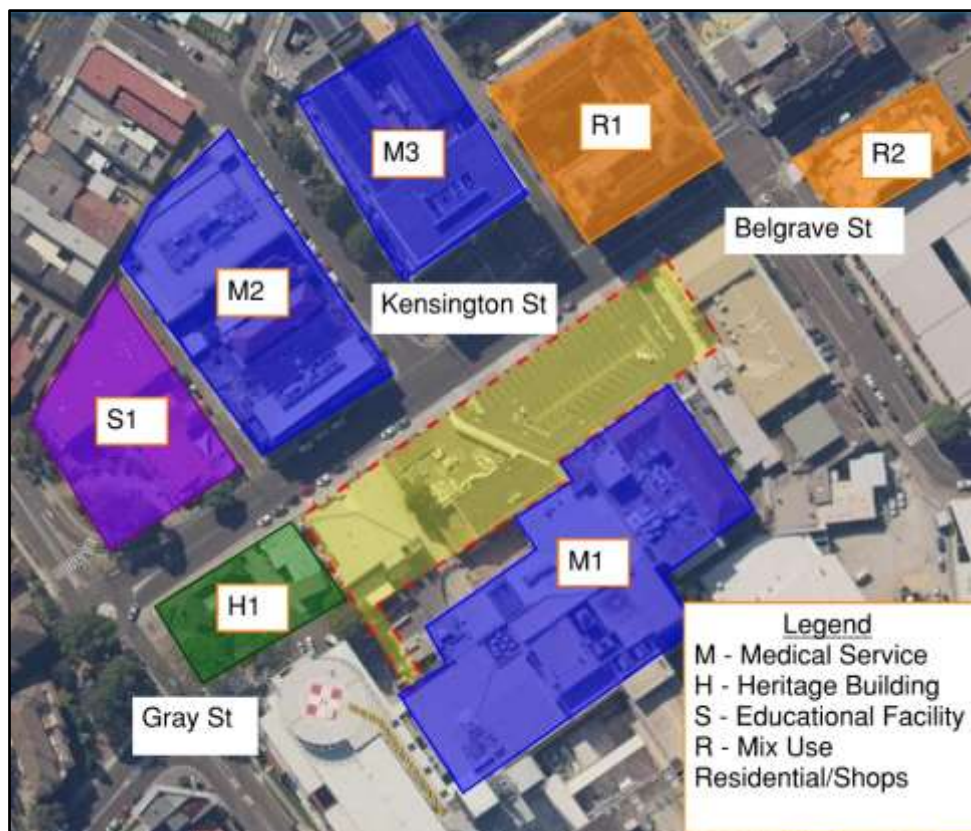
The purpose of this document is to provide a practical construction dust monitoring information to assess the environmental impact / air pollutants on the surrounding properties, compare the collected dust results against the recommended criteria and to provide a discussion about the mitigation measures to reduce the likelihood of its occurrence.

## 2. Sensitive Receivers

### Sensitive Dust Receivers

The nearest dust sensitive receivers are identified in Figure 1 and listed below:

- ❖ M1, Medical Facility on the Southern boundary of the site.
- ❖ M2, Medical Facility on the Norther boundary of the site along Kensington St.
- ❖ M3, Medical Facility on the Norther boundary of the site along Kensington St.
- ❖ H1, Fire Station (heritage) on the Western side of the boundary.
- ❖ SW, Sydney Water asset along the Northern boundary of the site along Kensington St





### 3. Dust Criteria

#### 3.1 Applicable Standards

The list below illustrates the relevant reports, standards, guidelines or policies that has been used during the preparation of this report:

- ❖ State of NSW and Environment Protection Authority (EPA), “Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales” (2016).
- ❖ The Office of Parliamentary Counsel, Canberra, “National Environment Protection (Ambient Air Quality) Measure” (May 2021).
- ❖ Australian Standard “AS 2985 – 2009: Workplace atmospheres - Methods for sampling and gravimetric determination of respirable dust”
- ❖ Australian Standard “AS 3640 – 2009: Workplace atmospheres - Method for sampling and gravimetric determination of inhalable dust”

#### 3.2 Dust Criteria

In this report, dust data will be assessed against the criteria from the EPA document “Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales” which is recommended by the “National Environment Protection (Ambient Air Quality) Measure”. It should be noted that no dust management plan was provided / prepared for this site.

Table 1 Guideline values for dust particles  $PM_{2.5}$  and  $PM_{10}$

Pollutant	Maximum Concentration ( $\mu\text{g}/\text{m}^3$ )	Averaging Period (hrs)
$PM_{2.5}$	25	24
$PM_{10}$	50	24

Figure 2 represents a summary of the extracted equivalent particle aerodynamic diameter (EAD) in relation to their respirability and inhalable convention and their corresponding percentage in accordance with AS2985-2009 and AS3640-2009

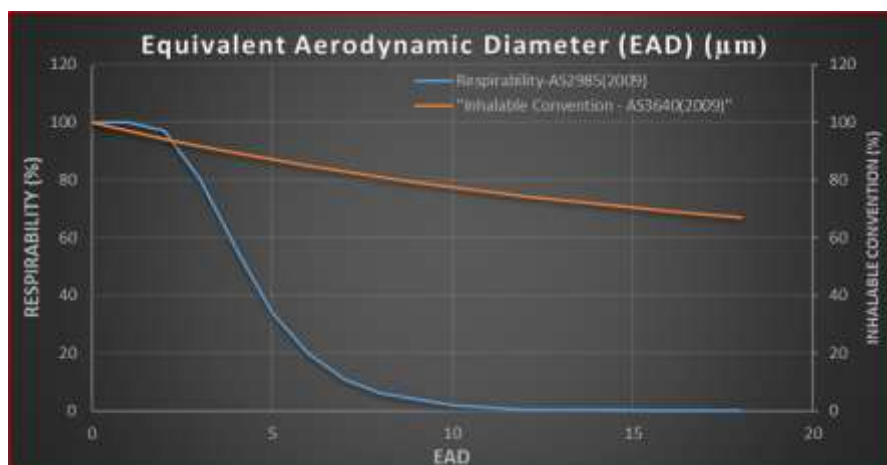


Figure 2 Site setup



#### 4. Methodology

Two dust data monitors were installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function. The monitors utilise a (Class 1) laser particle monitor to report air pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub> in 360 - degrees. The measurements specifications are illustrated in table below.

Monitor 1 and Monitor 2 are on a solar stand in accordance with the manufacturer's recommendations. The monitor was (re)located to be as close to the operating plant as possible, site setup is shown in Figure 3 below. Each device was set to continuous daily monitoring mode at 15-minute intervals recording pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub>.

*Table 2 Dust monitor specifications*

<b>Particle range*</b>	Max coincidence probability	0.30 to 12.4
<b>Size categorisation</b>	Number of software bins	16
<b>Sampling interval</b>	Histogram Period (sec)	2 to 30
<b>Total flow rate</b>	L/min (typical)	0.24
<b>Max particle count rate</b>	Particles/sec	10,000
<b>Max coincidence probability</b>	% concentration @ 10 <sup>6</sup> particles/L	0.7

\* Based on 50% detection efficiency @ 035 µm



*Figure 3 Site setup*

## 5. Monitoring Results

### Dust Monitoring

The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations are summarised in the following table:

*Table 3 Daily average PM<sub>2.5</sub> Concentration*

Date	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> )
Fri 02/06/2023	8.7	5.2	25.0
Sat 03/06/2023	7.3	4.1	25.0
Mon 05/06/2023	4.4	1.5	25.0
Tue 06/06/2023	1.8	3.3	25.0
Wed 07/06/2023	2.4	2.0	25.0
Thu 08/06/2023	5.8	1.6	25.0

*Table 4 Daily average PM<sub>10</sub> Concentration*

Date	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>10</sub> concentration (µg/m <sup>3</sup> )
Fri 02/06/2023	29.0	17.1	50.0
Sat 03/06/2023	84.1	44.2	50.0
Mon 05/06/2023	35.6	7.1	50.0
Tue 06/06/2023	7.7	23.5	50.0
Wed 07/06/2023	9.0	11.3	50.0
Thu 08/06/2023	12.5	7.8	50.0

## 6. Discussion and Recommendations

As can be seen from the previous section and the graphs below, the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be below the criteria except on one occasion where there was an exceedance from Monitor 1 on 03/06/2023.

### Best management practice

Feasible and reasonable mitigation measures should be applied and best management practices should be used to reduce values as far as practicable, and a comprehensive community consultation program should be instituted.

An example of a possible management strategies is listed below:

- ❖ Minimise works that generates dust during extreme weather conditions such as windy days, hot

and dry days.

- ❖ Spray water during excavation works as well as on stockpiles.
- ❖ Dampen and/or cover stockpiles.
- ❖ Cover vehicle loads when leaving/entering the site.
- ❖ Reduce the vehicle speed when operating on site.
- ❖ Remove any mud and/or dust stuck on vehicles prior to leaving the site.
- ❖ Typical issues covered in a consultation program include a public contact point for handling complaints
- ❖ Early notification of proposed operations and any significant change to operations

### **Complaint Management**

An effective community relations program is essential to keep the stakeholders informed throughout the project development process, to obtain valuable data related to the project, and to become aware of any project-related impacts in a timely manner. Additionally, the community is likely to be more understanding and accepting of the dust where the information provided is frank, does not attempt to understate the likely environmental dust impacts and if commitments made are firmly adhered to. A range of media could be used to notify the community before and during construction, including use of community meetings, individual contact and letterbox drops. Contact details for complaints and further information, including emergency phone numbers, should be readily available to the community.

## **7. Conclusions**

The dust monitoring results found on Table 3 and Table 4 summarise the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations recorded and compared to the criteria set for this project. The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be below the criteria except on one occasion where there was an exceedance from Monitor 1 on 03/06/2023. Further monitoring is recommended and dust controls should be implemented to minimise the impact on the surrounding residents.

## Important information about this report

### Introduction

This report has been prepared by Paragon for you, in accordance with the agreed scope, schedule and budget. The opinions, recommendations and conclusions set out herein has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared. It is based on information gained from site conditions. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterization of site conditions is an interpretation of information collected during assessment, in accordance with industry practice. This interpretation is not a complete description of all conditions on or in the vicinity of the site, due to the inherent variation in spatial and temporal vibration information. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

### Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to other sites, nor can it be used when the nature of the specific purpose changes from that which we agreed.

### Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Paragon. The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete. This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of defect(s) or other effects can change over time, as a result of either natural processes or human influence. Paragon should be kept apprised of any such events and should be consulted for further investigations if any changes are noted.

### Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Paragon assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report. To avoid misuse of the information presented in your report, we recommend that Paragon be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report.

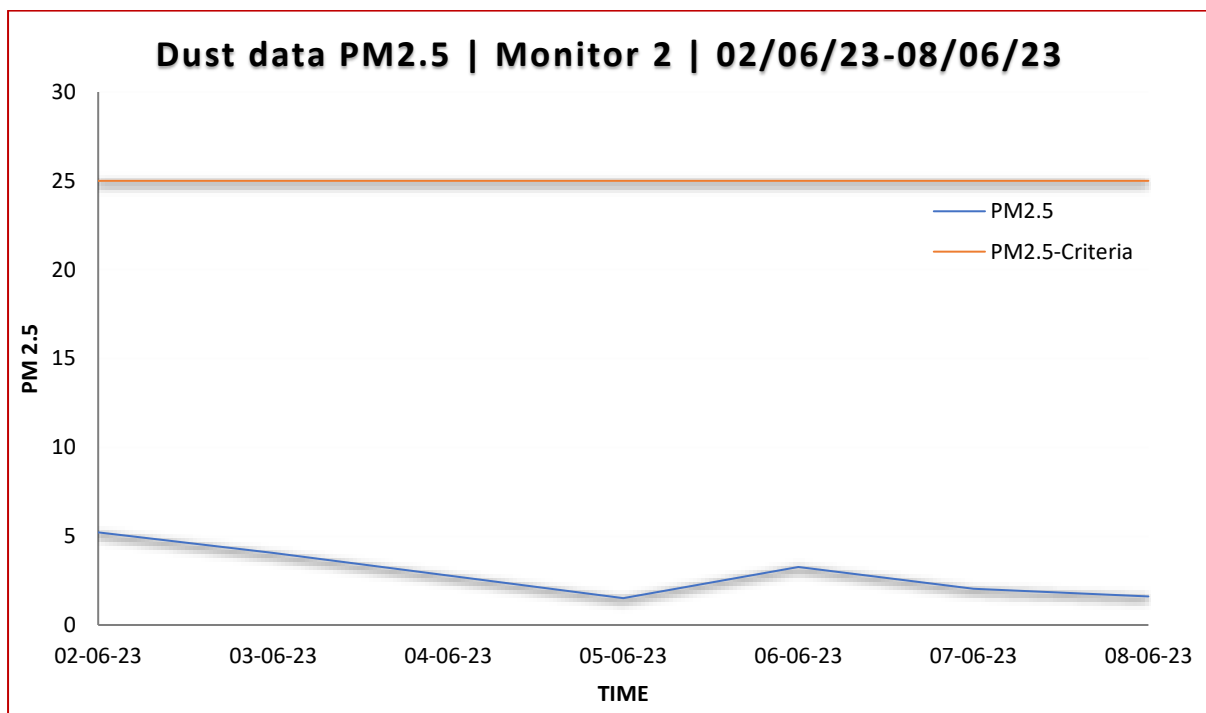
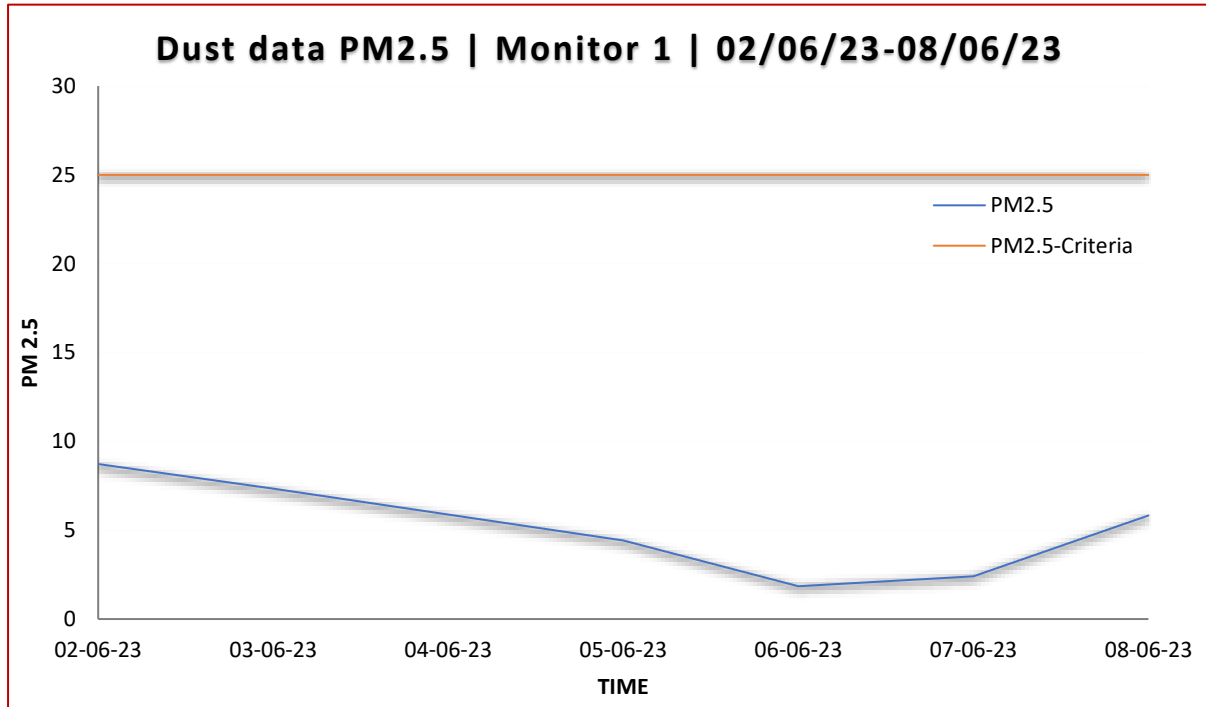
### Interpretation by other professionals

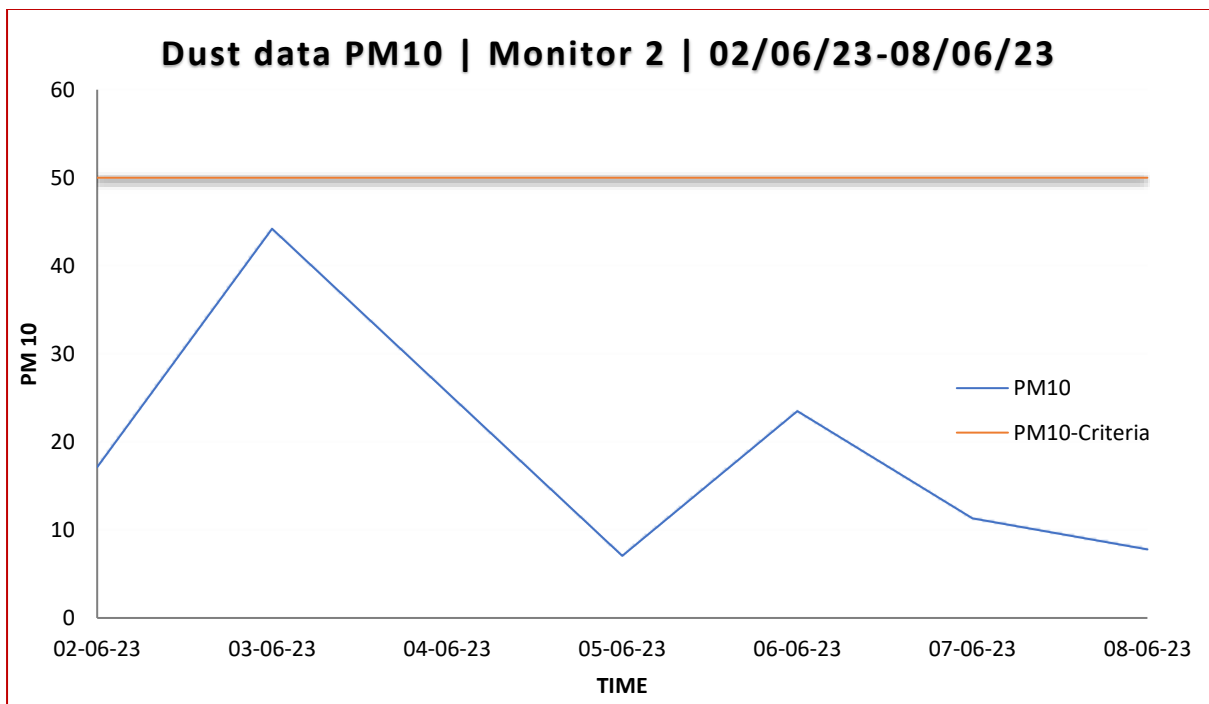
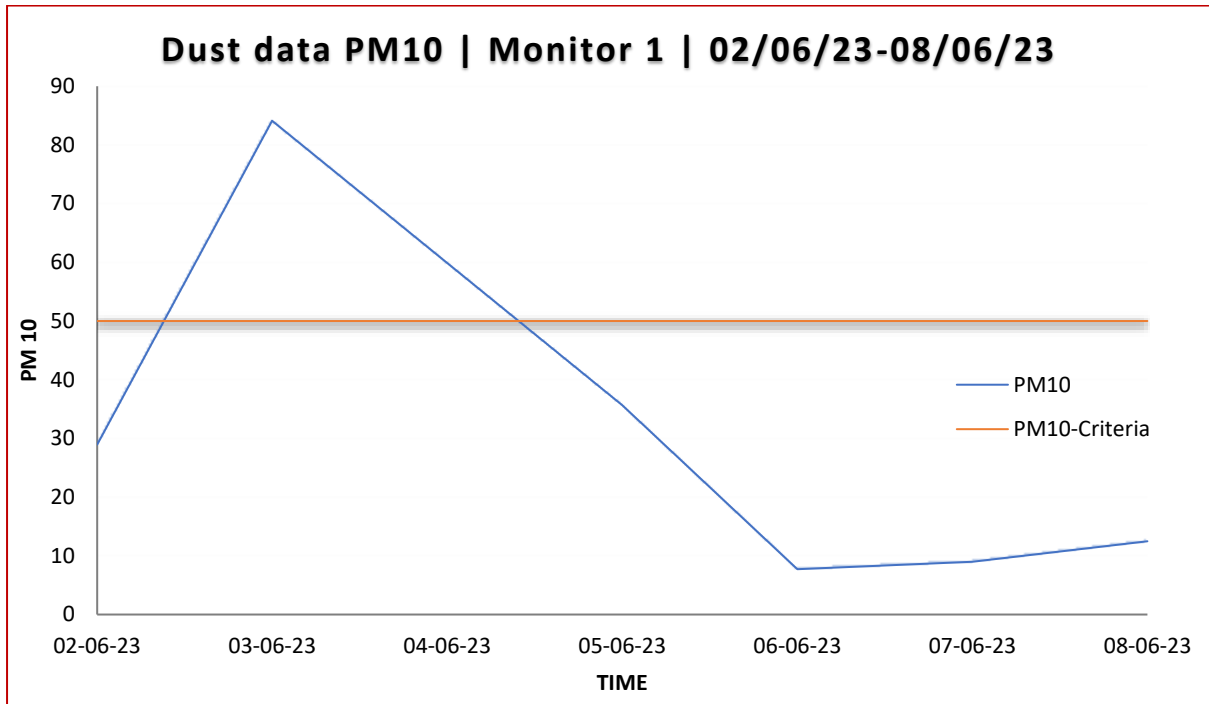
Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings. Given Paragon prepared the report and has familiarity with the site, Paragon is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Paragon disowns any responsibility for such misinterpretation.

### Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, acquired data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way. This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

## Appendix 1 – Dust Monitoring Data







**PARAGON**  
ENGINEERING

## **CONSTRUCTION NOISE AND VIBRATION REPORT**

Client:  
**MOITS PTY LTD**

**Stage 3 St. George Hospital,  
16 Kensington Street,  
Kogarah**



Monitoring Period:  
09 June 2023 to 15 June 2023

30 June 2023  
Ref: PAR-23661- DM05[A]





# DUST MONITORING REPORT

## Stage 3 St. George Hospital

### 16 Kensington St, Kogarah

For Duration:  
09 June 2023 – 15 June 2023

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Peter Zwamborn  
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This report provides weekly dust monitoring information for the excavation works of the above site.

Two dust monitor was installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function.

Dust data was assessed against the criteria from the EPA document titled "Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales". Based on the EPA criteria, the daily maximum concentration for this site was set to **25 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>2.5</sub>) and **50 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>10</sub>).

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### 1.3 Objectives

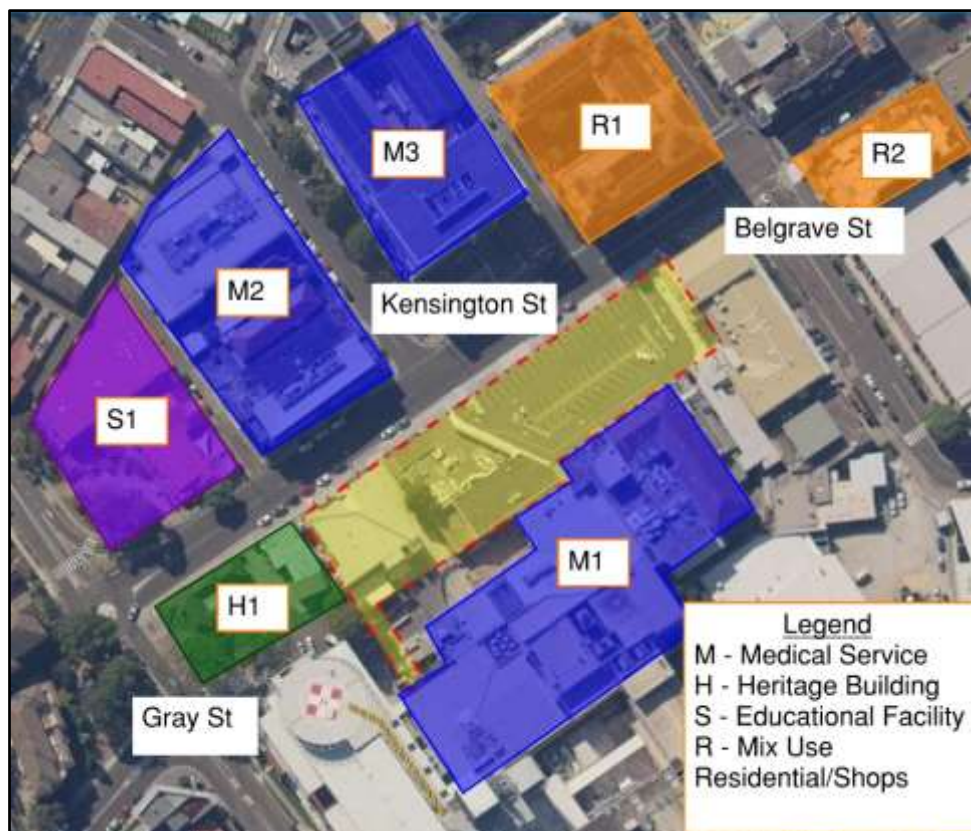
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### Sensitive Dust Receivers

The nearest dust sensitive receivers are identified in Figure 1 and listed below:

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#### 3.1 Applicable Standards

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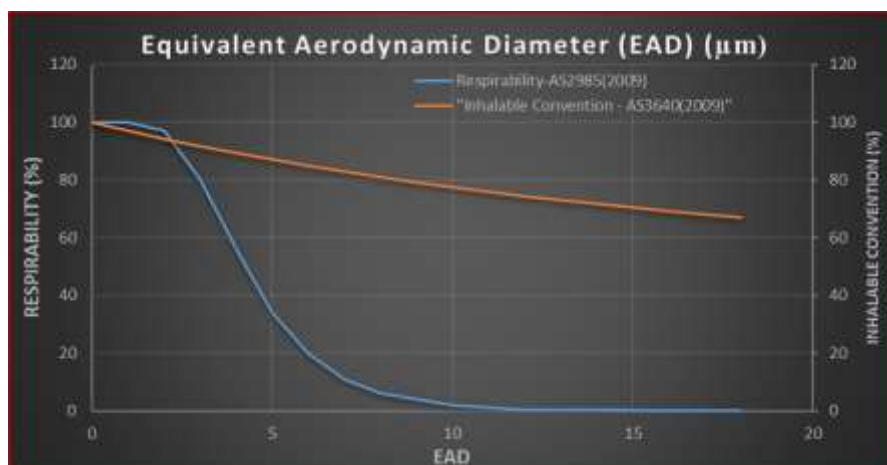


Figure 2 Site setup



#### 4. Methodology

Two dust data monitors were installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function. The monitors utilise a (Class 1) laser particle monitor to report air pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub> in 360 - degrees. The measurements specifications are illustrated in table below.

Monitor 1 and Monitor 2 are on a solar stand in accordance with the manufacturer's recommendations. The monitor was (re)located to be as close to the operating plant as possible, site setup is shown in Figure 3 below. Each device was set to continuous daily monitoring mode at 15-minute intervals recording pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub>.

*Table 2 Dust monitor specifications*

<b>Particle range*</b>	Max coincidence probability	0.30 to 12.4
<b>Size categorisation</b>	Number of software bins	16
<b>Sampling interval</b>	Histogram Period (sec)	2 to 30
<b>Total flow rate</b>	L/min (typical)	0.24
<b>Max particle count rate</b>	Particles/sec	10,000
<b>Max coincidence probability</b>	% concentration @ 10 <sup>6</sup> particles/L	0.7

\* Based on 50% detection efficiency @ 035 µm



*Figure 3 Site setup*



## 5. Monitoring Results

### Dust Monitoring

The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations are summarised in the following table:

*Table 3 Daily average PM<sub>2.5</sub> Concentration*

Date	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> )
Fri 09/06/2023	2.0	1.7	25.0
Sat 10/06/2023	1.0	0.6	25.0
Mon 12/06/2023	2.7	1.5	25.0
Tue 13/06/2023	1.7	0.9	25.0
Wed 14/06/2023	2.4	2.0	25.0
Thu 15/06/2023	3.3	2.7	25.0

*Table 4 Daily average PM<sub>10</sub> Concentration*

Date	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>10</sub> concentration (µg/m <sup>3</sup> )
Fri 09/06/2023	17.1	15.5	50.0
Sat 10/06/2023	44.2	1.4	50.0
Mon 12/06/2023	7.1	4.1	50.0
Tue 13/06/2023	23.5	3.8	50.0
Wed 14/06/2023	11.3	24.5	50.0
Thu 15/06/2023	7.8	36.1	50.0

## 6. Discussion and Recommendations

As can be seen from the previous section and the graphs below, the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria.

### Best management practice

Feasible and reasonable mitigation measures should be applied and best management practices should be used to reduce values as far as practicable, and a comprehensive community consultation program should be instituted.

An example of a possible management strategies is listed below:

- ❖ Minimise works that generates dust during extreme weather conditions such as windy days, hot and dry days.

- ❖ Spray water during excavation works as well as on stockpiles.
- ❖ Dampen and/or cover stockpiles.
- ❖ Cover vehicle loads when leaving/entering the site.
- ❖ Reduce the vehicle speed when operating on site.
- ❖ Remove any mud and/or dust stuck on vehicles prior to leaving the site.
- ❖ Typical issues covered in a consultation program include a public contact point for handling complaints
- ❖ Early notification of proposed operations and any significant change to operations

### **Complaint Management**

An effective community relations program is essential to keep the stakeholders informed throughout the project development process, to obtain valuable data related to the project, and to become aware of any project-related impacts in a timely manner. Additionally, the community is likely to be more understanding and accepting of the dust where the information provided is frank, does not attempt to understate the likely environmental dust impacts and if commitments made are firmly adhered to. A range of media could be used to notify the community before and during construction, including use of community meetings, individual contact and letterbox drops. Contact details for complaints and further information, including emergency phone numbers, should be readily available to the community.

## **7. Conclusions**

The dust monitoring results found on Table 3 and Table 4 summarise the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations recorded and compared to the criteria set for this project. The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria. Further monitoring is recommended and dust controls should be implemented to minimise the impact on the surrounding residents.

## Important information about this report

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### Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to other sites, nor can it be used when the nature of the specific purpose changes from that which we agreed.

### Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Paragon. The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete. This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of defect(s) or other effects can change over time, as a result of either natural processes or human influence. Paragon should be kept apprised of any such events and should be consulted for further investigations if any changes are noted.

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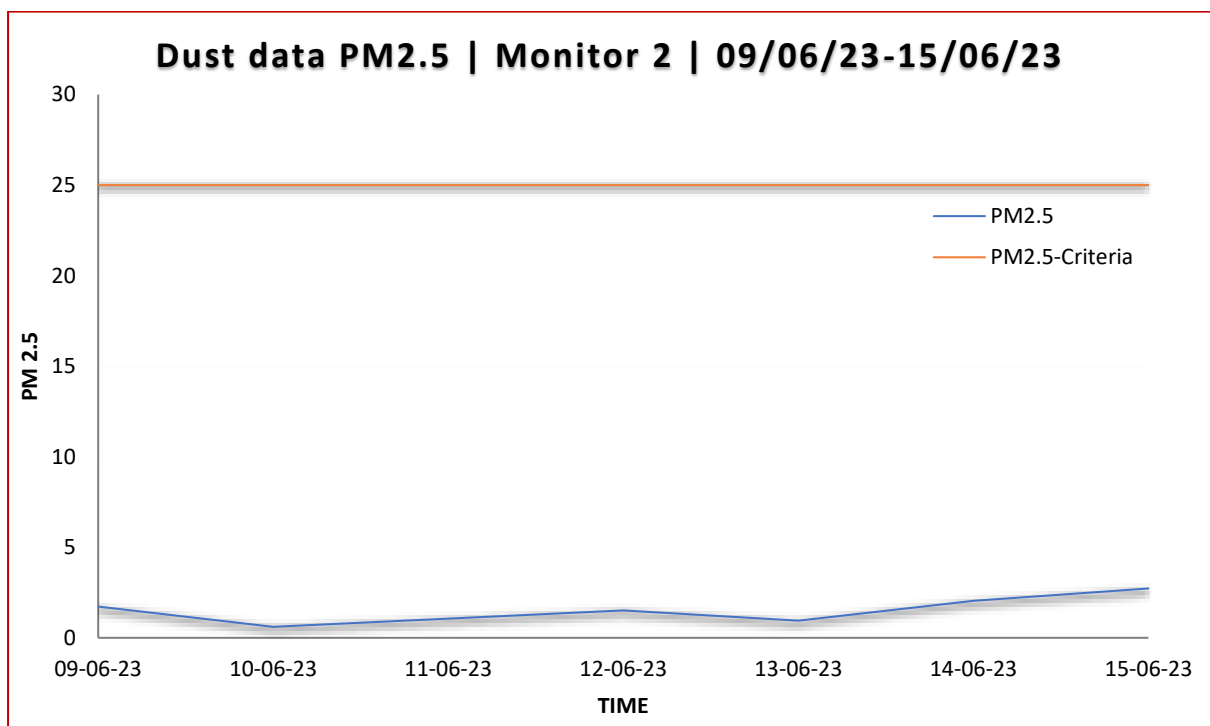
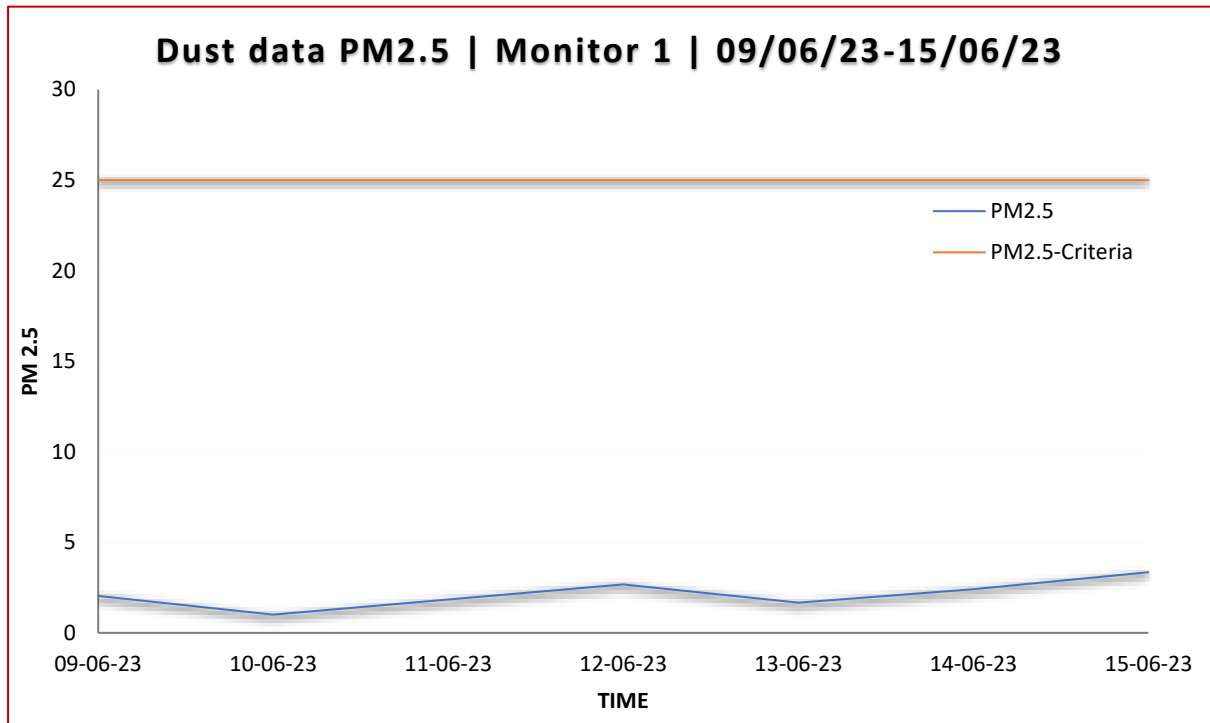
### Interpretation by other professionals

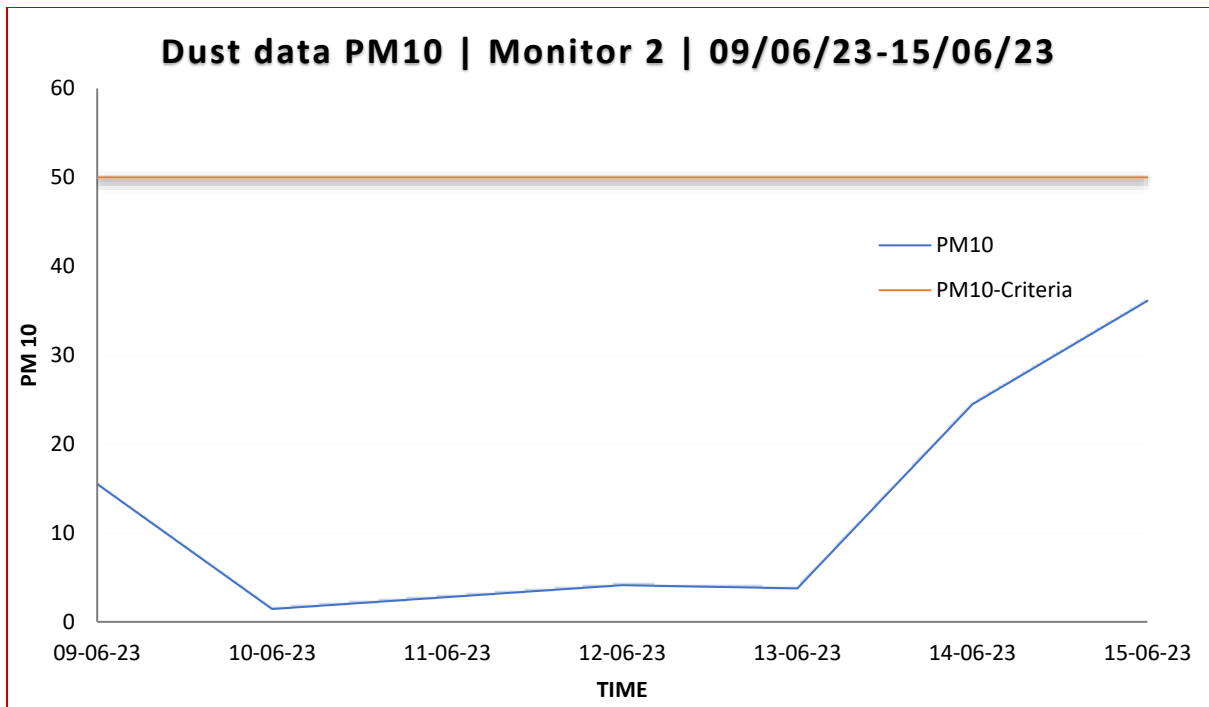
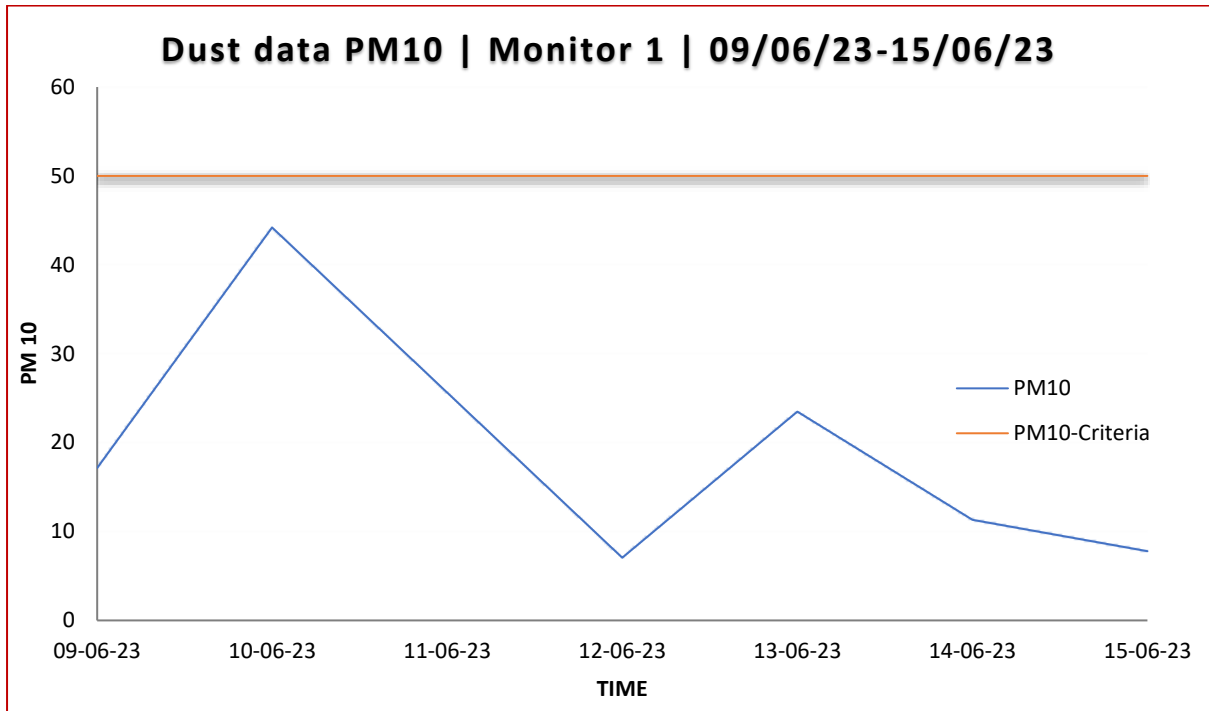
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The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, acquired data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way. This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

## Appendix 1 – Dust Monitoring Data







**PARAGON**  
ENGINEERING

## **CONSTRUCTION NOISE AND VIBRATION REPORT**

Client:  
**MOITS PTY LTD**

**Stage 3 St. George Hospital,  
16 Kensington Street,  
Kogarah**



Monitoring Period:  
16 June 2023 to 22 June 2023

30 June 2023  
Ref: PAR-23661- DM06[A]



# DUST MONITORING REPORT

## Stage 3 St. George Hospital

### 16 Kensington St, Kogarah

For Duration:  
16 June 2023 – 22 June 2023

Prepared for:  
Peter Zwamborn  
**MOITS PTY LTD**  
142 Wicks Rd, Macquarie Park NSW 2113

### Document Authorization

For and on behalf of Paragon Engineering

**Michael Duong**, BEng  
Civil Engineer

**Omar Al-Kubaisi**, MSc (Honors)  
Senior Structural Engineer

### Quality information

#### Revision history

Revision	Report Status	Date	Author	Reviewer
A	1 <sup>st</sup> Revision	30 June 2023	MD	OA

#### Distribution

Revision	No. of copies	Format	Distributed to	Date
A	1	PDF	MOITS Pty Ltd	30 June 2023



## Executive Summary

Paragon Engineering was commissioned by MOITS PTY LTD to provide dust monitoring services during the excavation and shoring activities for the development site located at St. George Hospital. The project comprises of excavation and construction of a new medical facility with two basement carpark.

This report provides weekly dust monitoring information for the excavation works of the above site.

Two dust monitor was installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function.

Dust data was assessed against the criteria from the EPA document titled "Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales". Based on the EPA criteria, the daily maximum concentration for this site was set to **25 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>2.5</sub>) and **50 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>10</sub>).

The dust monitoring results found on Table 3 and Table 4 summarise the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations recorded and compared to the criteria set for this project. The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria except on two occasions from Monitor 1 on 17/06/2023 and from Monitor 2 on 19/06/2023. Further monitoring is recommended, and dust controls should be implemented to minimise the impact on the surrounding residents.

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## 1. Introduction

### 1.1 Background

Paragon Engineering was commissioned by MOITS PTY LTD to provide dust monitoring services during the demolition, excavation and shoring activities for the development site located at St. George Hospital.

### 1.2 Site Information

The project is located at St. George Hospital. The Stage 3 redevelopment includes the piling, excavation and construction of a new Medical facility with two basement carpark. The nearest dust sensitive receivers are shown in *Figure 1*.

#### Working Hours

The Project construction working hours shall be in accordance with approved DA Condition C4-C8 as described below:

Activity	Permitted working hours
C4. Construction including the delivery of materials to and from site:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 7:00am to 6:00pm inclusive</li> <li>❖ Saturday - 8:00am to 1:00 pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>
C5. Notwithstanding condition C4, provide noise levels do not exceed the existing background level plus 5dB, work may also be undertaken during the following hours:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 6:00am to 7:00pm inclusive</li> <li>❖ Saturday - 1:00pm to 5:00 pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>
C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 if Required:	<ul style="list-style-type: none"> <li>❖ By the police or a public authority for the delivery of vehicles, plant or materials; or</li> <li>❖ In an emergency to avoid the loss of life, damage to property or to prevent environment harm; or</li> <li>❖ Where the works are inaudible at the nearest sensitive receivers; or</li> <li>❖ For the delivery, set-up and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or</li> <li>❖ Where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works</li> </ul>
C7. Notification of such construction activities as referenced in Condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	
C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 9:00am to 12:00pm</li> <li>❖ Monday to Friday - 2:00pm to 5:00 pm</li> <li>❖ Saturday – 9:00am to 12:00pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>

## 1.3 Objectives

The purpose of this document is to provide a practical construction dust monitoring information to assess the environmental impact / air pollutants on the surrounding properties, compare the collected dust results against the recommended criteria and to provide a discussion about the mitigation measures to reduce the likelihood of its occurrence.

## 2. Sensitive Receivers

### Sensitive Dust Receivers

The nearest dust sensitive receivers are identified in Figure 1 and listed below:

- ❖ M1, Medical Facility on the Southern boundary of the site.
- ❖ M2, Medical Facility on the Norther boundary of the site along Kensington St.
- ❖ M3, Medical Facility on the Norther boundary of the site along Kensington St.
- ❖ H1, Fire Station (heritage) on the Western side of the boundary.
- ❖ SW, Sydney Water asset along the Northern boundary of the site along Kensington St

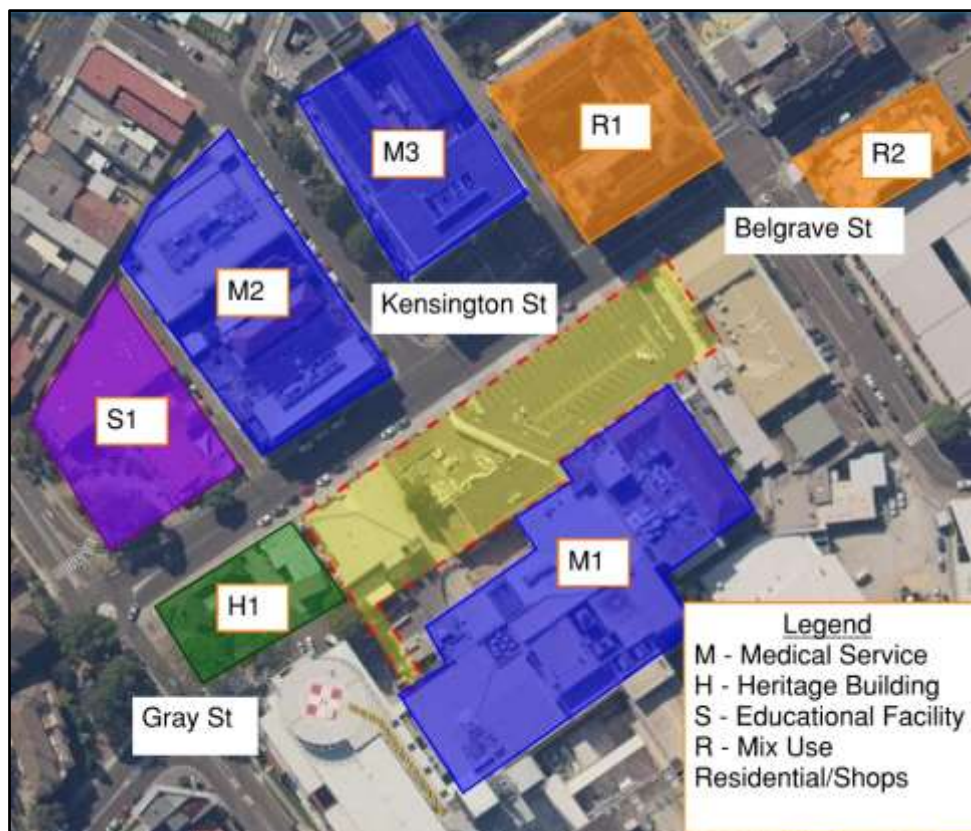


Figure 1 Site plan

### 3. Dust Criteria

#### 3.1 Applicable Standards

The list below illustrates the relevant reports, standards, guidelines or policies that has been used during the preparation of this report:

- ❖ State of NSW and Environment Protection Authority (EPA), “Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales” (2016).
- ❖ The Office of Parliamentary Counsel, Canberra, “National Environment Protection (Ambient Air Quality) Measure” (May 2021).
- ❖ Australian Standard “AS 2985 – 2009: Workplace atmospheres - Methods for sampling and gravimetric determination of respirable dust”
- ❖ Australian Standard “AS 3640 – 2009: Workplace atmospheres - Method for sampling and gravimetric determination of inhalable dust”

#### 3.2 Dust Criteria

In this report, dust data will be assessed against the criteria from the EPA document “Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales” which is recommended by the “National Environment Protection (Ambient Air Quality) Measure”. It should be noted that no dust management plan was provided / prepared for this site.

Table 1 Guideline values for dust particles  $PM_{2.5}$  and  $PM_{10}$

Pollutant	Maximum Concentration ( $\mu\text{g}/\text{m}^3$ )	Averaging Period (hrs)
$PM_{2.5}$	25	24
$PM_{10}$	50	24

Figure 2 represents a summary of the extracted equivalent particle aerodynamic diameter (EAD) in relation to their respirability and inhalable convention and their corresponding percentage in accordance with AS2985-2009 and AS3640-2009

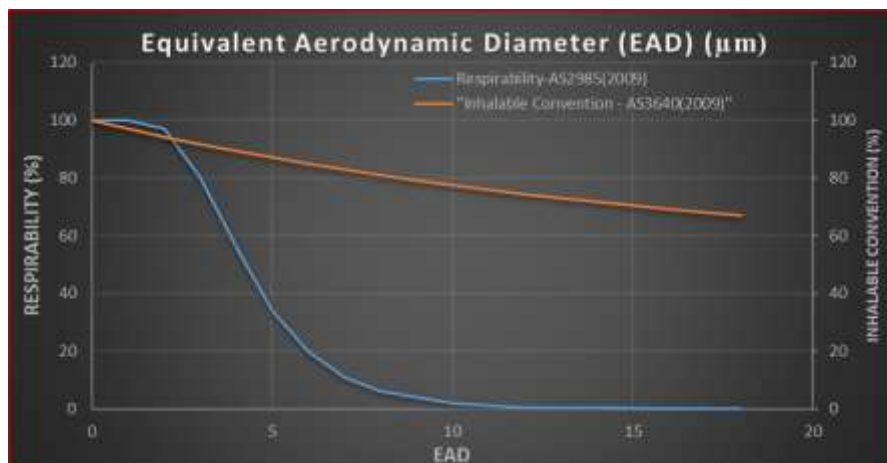


Figure 2 Site setup



#### 4. Methodology

Two dust data monitors were installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function. The monitors utilise a (Class 1) laser particle monitor to report air pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub> in 360 - degrees. The measurements specifications are illustrated in table below.

Monitor 1 and Monitor 2 are on a solar stand in accordance with the manufacturer's recommendations. The monitor was (re)located to be as close to the operating plant as possible, site setup is shown in Figure 3 below. Each device was set to continuous daily monitoring mode at 15-minute intervals recording pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub>.

*Table 2 Dust monitor specifications*

<b>Particle range*</b>	Max coincidence probability	0.30 to 12.4
<b>Size categorisation</b>	Number of software bins	16
<b>Sampling interval</b>	Histogram Period (sec)	2 to 30
<b>Total flow rate</b>	L/min (typical)	0.24
<b>Max particle count rate</b>	Particles/sec	10,000
<b>Max coincidence probability</b>	% concentration @ 10 <sup>6</sup> particles/L	0.7

\* Based on 50% detection efficiency @ 035 µm



*Figure 3 Site setup*

## 5. Monitoring Results

### Dust Monitoring

The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations are summarised in the following table:

*Table 3 Daily average PM<sub>2.5</sub> Concentration*

Date	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> )
Fri 16/06/2023	2.0	3.0	25.0
Sat 17/06/2023	1.0	1.4	25.0
Mon 19/06/2023	2.7	4.8	25.0
Tue 20/06/2023	1.7	2.2	25.0
Wed 21/06/2023	2.4	--	25.0
Thu 22/06/2023	3.3	1.5	25.0

*Table 4 Daily average PM<sub>10</sub> Concentration*

Date	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>10</sub> concentration (µg/m <sup>3</sup> )
Fri 16/06/2023	17.1	34.1	50.0
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As can be seen from the previous section and the graphs below, the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria except on two occasions from Monitor 1 on 17/06/2023 and from Monitor 2 on 19/06/2023.

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Feasible and reasonable mitigation measures should be applied and best management practices should be used to reduce values as far as practicable, and a comprehensive community consultation program should be instituted.

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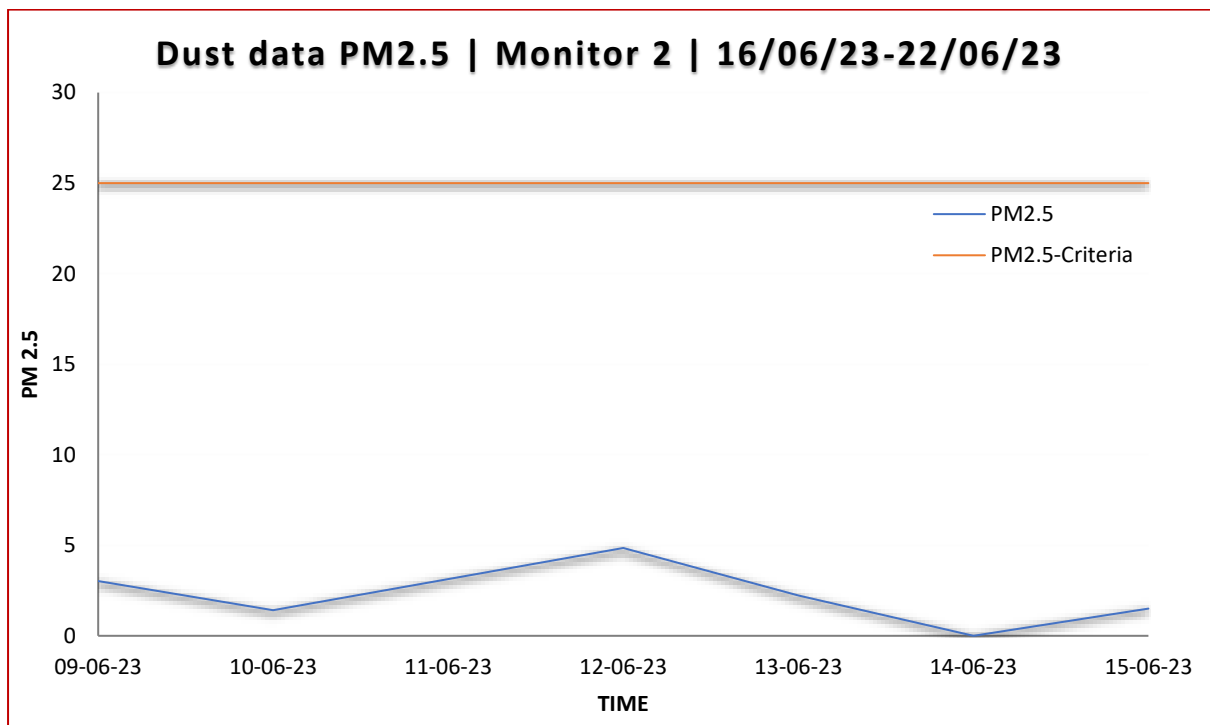
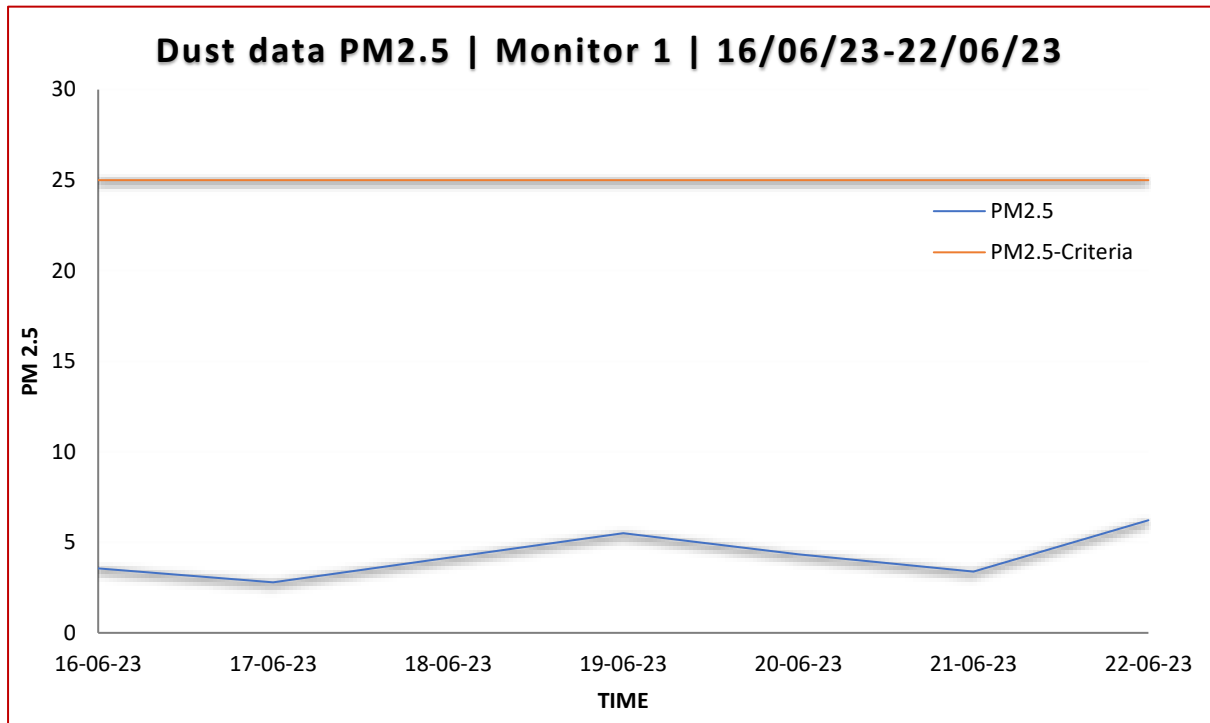
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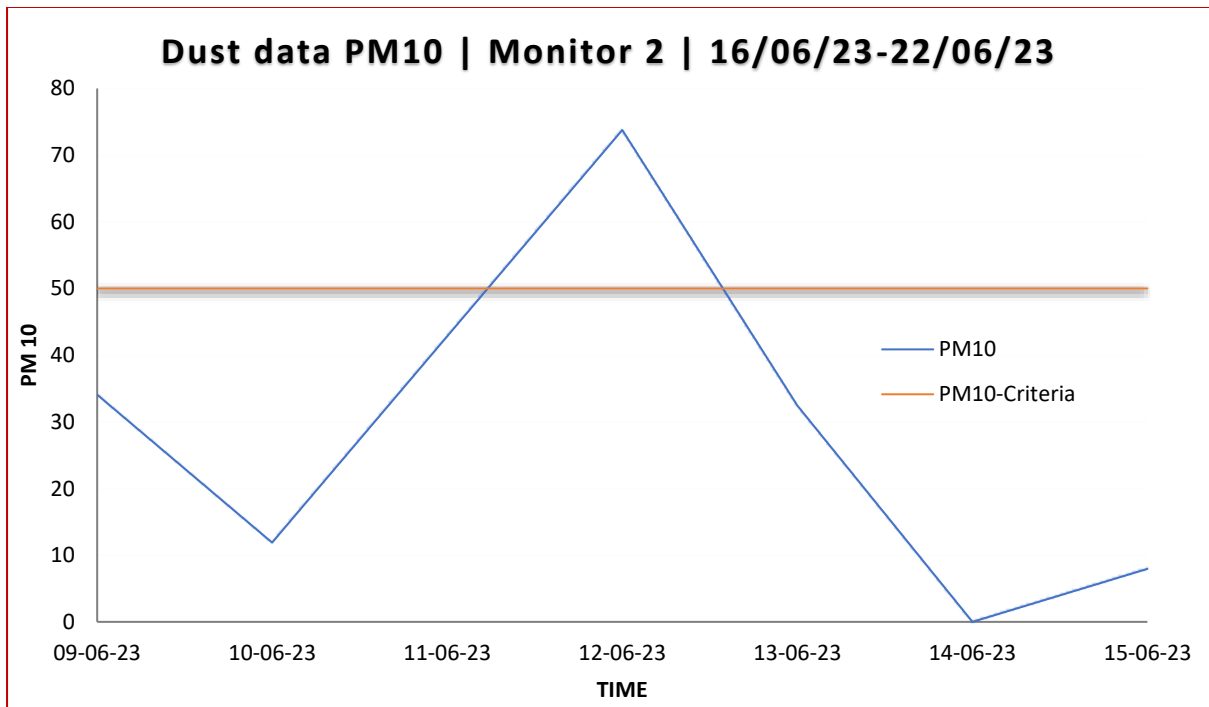
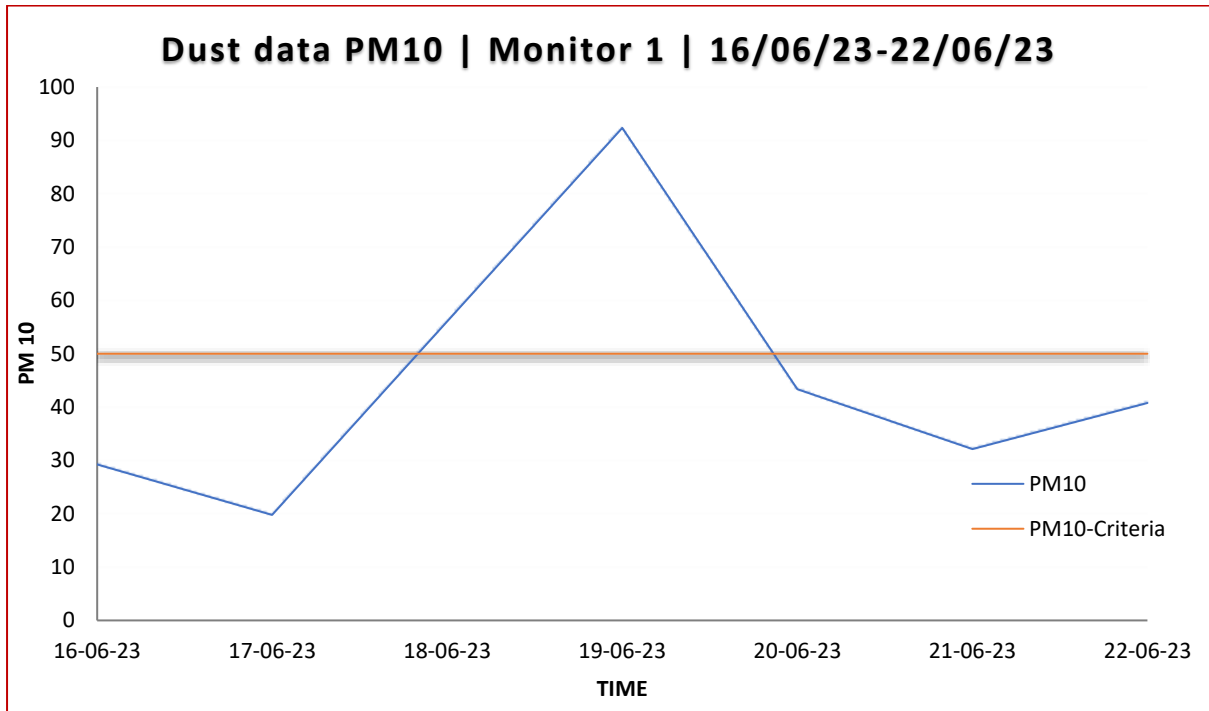
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## Appendix 1 – Dust Monitoring Data







**PARAGON**  
ENGINEERING

## **CONSTRUCTION NOISE AND VIBRATION REPORT**

Client:  
**MOITS PTY LTD**

**Stage 3 St. George Hospital,  
16 Kensington Street,  
Kogarah**



Monitoring Period:  
23 June 2023 to 29 June 2023

12 July 2023  
Ref: PAR-23661- DM07[A]



# DUST MONITORING REPORT

## Stage 3 St. George Hospital

### 16 Kensington St, Kogarah

For Duration:  
23 June 2023 – 29 June 2023

Prepared for:  
Peter Zwamborn  
**MOITS PTY LTD**  
142 Wicks Rd, Macquarie Park NSW 2113

### Document Authorization

For and on behalf of Paragon Engineering

**Michael Duong**, BEng  
Civil Engineer

**Omar Al-Kubaisi**, MSc (Honors)  
Senior Structural Engineer

### Quality information

#### Revision history

Revision	Report Status	Date	Author	Reviewer
A	1 <sup>st</sup> Revision	12 July 2023	MD	OA

#### Distribution

Revision	No. of copies	Format	Distributed to	Date
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## Executive Summary

Paragon Engineering was commissioned by MOITS PTY LTD to provide dust monitoring services during the excavation and shoring activities for the development site located at St. George Hospital. The project comprises of excavation and construction of a new medical facility with two basement carpark.

This report provides weekly dust monitoring information for the excavation works of the above site.

Two dust monitor was installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function.

Dust data was assessed against the criteria from the EPA document titled "Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales". Based on the EPA criteria, the daily maximum concentration for this site was set to **25 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>2.5</sub>) and **50 $\mu\text{m}/\text{m}^3$**  for Pollutant Particles (PM<sub>10</sub>).

The dust monitoring results found on Table 3 and Table 4 summarise the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations recorded and compared to the criteria set for this project. The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria except on one occasion from Monitor 1 on 26/06/2023. Due to low voltage, data from 23/06/2023 to 26/06/2023 for Monitor 2 could not be collected. Further monitoring is recommended, and dust controls should be implemented to minimise the impact on the surrounding residents.



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## 1. Introduction

### 1.1 Background

Paragon Engineering was commissioned by MOITS PTY LTD to provide dust monitoring services during the demolition, excavation and shoring activities for the development site located at St. George Hospital.

### 1.2 Site Information

The project is located at St. George Hospital. The Stage 3 redevelopment includes the piling, excavation and construction of a new Medical facility with two basement carpark. The nearest dust sensitive receivers are shown in *Figure 1*.

#### Working Hours

The Project construction working hours shall be in accordance with approved DA Condition C4-C8 as described below:

Activity	Permitted working hours
C4. Construction including the delivery of materials to and from site:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 7:00am to 6:00pm inclusive</li> <li>❖ Saturday - 8:00am to 1:00 pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>
C5. Notwithstanding condition C4, provide noise levels do not exceed the existing background level plus 5dB, work may also be undertaken during the following hours:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 6:00am to 7:00pm inclusive</li> <li>❖ Saturday - 1:00pm to 5:00 pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>
C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 if Required:	<ul style="list-style-type: none"> <li>❖ By the police or a public authority for the delivery of vehicles, plant or materials; or</li> <li>❖ In an emergency to avoid the loss of life, damage to property or to prevent environment harm; or</li> <li>❖ Where the works are inaudible at the nearest sensitive receivers; or</li> <li>❖ For the delivery, set-up and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or</li> <li>❖ Where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works</li> </ul>
C7. Notification of such construction activities as referenced in Condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	
C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:	<ul style="list-style-type: none"> <li>❖ Monday to Friday – 9:00am to 12:00pm</li> <li>❖ Monday to Friday - 2:00pm to 5:00 pm</li> <li>❖ Saturday – 9:00am to 12:00pm</li> <li>❖ Sunday &amp; public holidays - No work permitted</li> </ul>

## 1.3 Objectives

The purpose of this document is to provide a practical construction dust monitoring information to assess the environmental impact / air pollutants on the surrounding properties, compare the collected dust results against the recommended criteria and to provide a discussion about the mitigation measures to reduce the likelihood of its occurrence.

## 2. Sensitive Receivers

### Sensitive Dust Receivers

The nearest dust sensitive receivers are identified in Figure 1 and listed below:

- ❖ M1, Medical Facility on the Southern boundary of the site.
- ❖ M2, Medical Facility on the Norther boundary of the site along Kensington St.
- ❖ M3, Medical Facility on the Norther boundary of the site along Kensington St.
- ❖ H1, Fire Station (heritage) on the Western side of the boundary.
- ❖ SW, Sydney Water asset along the Northern boundary of the site along Kensington St



Figure 1 Site plan

### 3. Dust Criteria

#### 3.1 Applicable Standards

The list below illustrates the relevant reports, standards, guidelines or policies that has been used during the preparation of this report:

- ❖ State of NSW and Environment Protection Authority (EPA), “Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales” (2016).
- ❖ The Office of Parliamentary Counsel, Canberra, “National Environment Protection (Ambient Air Quality) Measure” (May 2021).
- ❖ Australian Standard “AS 2985 – 2009: Workplace atmospheres - Methods for sampling and gravimetric determination of respirable dust”
- ❖ Australian Standard “AS 3640 – 2009: Workplace atmospheres - Method for sampling and gravimetric determination of inhalable dust”

#### 3.2 Dust Criteria

In this report, dust data will be assessed against the criteria from the EPA document “Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales” which is recommended by the “National Environment Protection (Ambient Air Quality) Measure”. It should be noted that no dust management plan was provided / prepared for this site.

Table 1 Guideline values for dust particles  $PM_{2.5}$  and  $PM_{10}$

Pollutant	Maximum Concentration ( $\mu\text{g}/\text{m}^3$ )	Averaging Period (hrs)
$PM_{2.5}$	25	24
$PM_{10}$	50	24

Figure 2 represents a summary of the extracted equivalent particle aerodynamic diameter (EAD) in relation to their respirability and inhalable convention and their corresponding percentage in accordance with AS2985-2009 and AS3640-2009

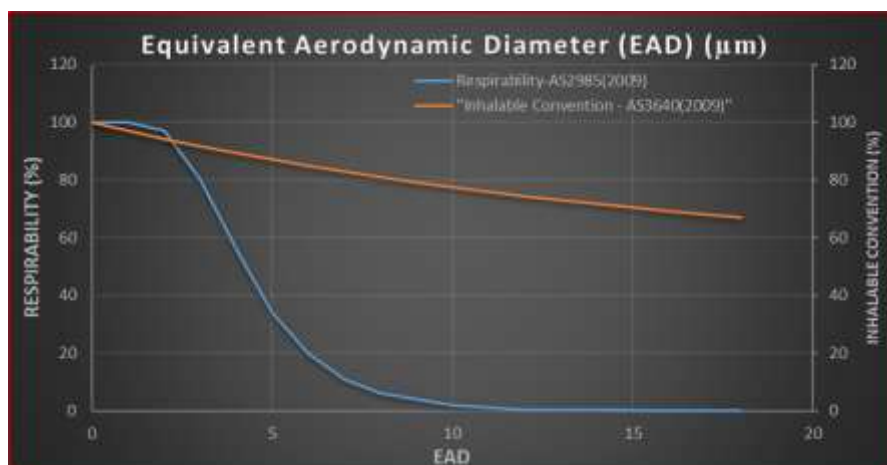


Figure 2 Site setup

#### 4. Methodology

Two dust data monitors were installed on site, the monitors are equipped with on-board modem which provides remote monitoring communication functions, system status and dust triggers are instantly reported through mobile SMS function. The monitors utilise a (Class 1) laser particle monitor to report air pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub> in 360 - degrees. The measurements specifications are illustrated in table below.

Monitor 1 and Monitor 2 are on a solar stand in accordance with the manufacturer's recommendations. The monitor was (re)located to be as close to the operating plant as possible, site setup is shown in Figure 3 below. Each device was set to continuous daily monitoring mode at 15-minute intervals recording pollutant particles as PM<sub>2.5</sub> and PM<sub>10</sub>.

*Table 2 Dust monitor specifications*

<b>Particle range*</b>	Max coincidence probability	0.30 to 12.4
<b>Size categorisation</b>	Number of software bins	16
<b>Sampling interval</b>	Histogram Period (sec)	2 to 30
<b>Total flow rate</b>	L/min (typical)	0.24
<b>Max particle count rate</b>	Particles/sec	10,000
<b>Max coincidence probability</b>	% concentration @ 10 <sup>6</sup> particles/L	0.7

\* Based on 50% detection efficiency @ 035 µm



*Figure 3 Site setup*



## 5. Monitoring Results

### Dust Monitoring

The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations are summarised in the following table:

*Table 3 Daily average PM<sub>2.5</sub> Concentration*

Date	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>2.5</sub> concentration (µg/m <sup>3</sup> )
Fri 23/06/2023	5.3	--	25.0
Sat 24/06/2023	1.4	--	25.0
Mon 26/06/2023	6.3	--	25.0
Tue 27/06/2023	5.1	2.5	25.0
Wed 28/06/2023	3.8	2.3	25.0
Thu 29/06/2023	2.1	1.6	25.0

*Table 4 Daily average PM<sub>10</sub> Concentration*

Date	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 1	Daily average PM <sub>10</sub> concentration (µg/m <sup>3</sup> ) – Monitor 2	Maximum daily PM <sub>10</sub> concentration (µg/m <sup>3</sup> )
Fri 23/06/2023	31.1	--	50.0
Sat 24/06/2023	10.7	--	50.0
Mon 26/06/2023	75.0	--	50.0
Tue 27/06/2023	36.3	28.6	50.0
Wed 28/06/2023	14.5	8.2	50.0
Thu 29/06/2023	14.3	10.0	50.0

## 6. Discussion and Recommendations

As can be seen from the previous section and the graphs below, the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria except on one occasion from Monitor 1 on 26/06/2023. Due to low voltage, data from 23/06/2023 to 26/06/2023 for Monitor 2 could not be collected.

### Best management practice

Feasible and reasonable mitigation measures should be applied and best management practices should be used to reduce values as far as practicable, and a comprehensive community consultation program should be instituted.

An example of a possible management strategies is listed below:

- ❖ Minimise works that generates dust during extreme weather conditions such as windy days, hot and dry days.
- ❖ Spray water during excavation works as well as on stockpiles.
- ❖ Dampen and/or cover stockpiles.
- ❖ Cover vehicle loads when leaving/entering the site.
- ❖ Reduce the vehicle speed when operating on site.
- ❖ Remove any mud and/or dust stuck on vehicles prior to leaving the site.
- ❖ Typical issues covered in a consultation program include a public contact point for handling complaints
- ❖ Early notification of proposed operations and any significant change to operations

### **Complaint Management**

An effective community relations program is essential to keep the stakeholders informed throughout the project development process, to obtain valuable data related to the project, and to become aware of any project-related impacts in a timely manner. Additionally, the community is likely to be more understanding and accepting of the dust where the information provided is frank, does not attempt to understate the likely environmental dust impacts and if commitments made are firmly adhered to. A range of media could be used to notify the community before and during construction, including use of community meetings, individual contact and letterbox drops. Contact details for complaints and further information, including emergency phone numbers, should be readily available to the community.

## **7. Conclusions**

The dust monitoring results found on Table 3 and Table 4 summarise the daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations recorded and compared to the criteria set for this project. The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were found to be within the criteria except on one occasion from Monitor 1 on 26/06/2023. Due to low voltage, data from 23/06/2023 to 26/06/2023 for Monitor 2 could not be collected. Further monitoring is recommended and dust controls should be implemented to minimise the impact on the surrounding residents.



## Important information about this report

### Introduction

This report has been prepared by Paragon for you, in accordance with the agreed scope, schedule and budget. The opinions, recommendations and conclusions set out herein has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared. It is based on information gained from site conditions. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterization of site conditions is an interpretation of information collected during assessment, in accordance with industry practice. This interpretation is not a complete description of all conditions on or in the vicinity of the site, due to the inherent variation in spatial and temporal vibration information. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

### Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to other sites, nor can it be used when the nature of the specific purpose changes from that which we agreed.

### Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Paragon. The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete. This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of defect(s) or other effects can change over time, as a result of either natural processes or human influence. Paragon should be kept apprised of any such events and should be consulted for further investigations if any changes are noted.

### Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Paragon assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report. To avoid misuse of the information presented in your report, we recommend that Paragon be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report.

### Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings. Given Paragon prepared the report and has familiarity with the site, Paragon is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Paragon disowns any responsibility for such misinterpretation.

### Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, acquired data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way. This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

## Appendix 1 – Dust Monitoring Data

