



# **Environmental Dust Assessment Report (May 2023)**

**Tweed Valley Hospital Project, Cudgen NSW**

Prepared for: Lendlease Building Pty Ltd

A101021.0286.00 | EDM46.Rev0 | Date: 2/08/2023



# Document Information

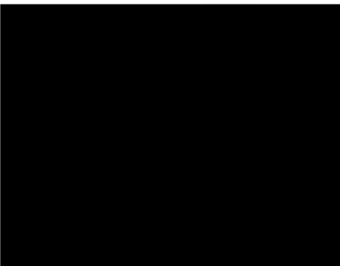
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For and on behalf of  
**ADE Consulting Group Pty Ltd**

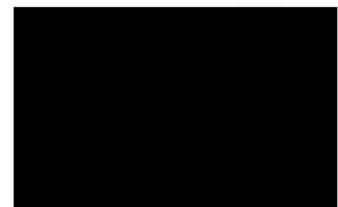
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# Executive Summary

ADE Consulting Group Pty Ltd (ADE) was commissioned by Lendlease Building (Lendlease) to measure the levels of dust generated during works at the Tweed Valley Hospital Project. The Tweed Valley Hospital Project and associated works is located at 771 Cudgen Road, Cudgen NSW hereafter referred to as 'the Site'. At the time of the dust monitoring program, Lendlease is completing superstructure works which commenced in 2022. CD Civil has been engaged for other civil works across the project and has begun road improvement works on Cudgen Road including construction of permanent footpaths, road construction and widening. All three (3) dust monitors are located on the southern alignment of Cudgen Road to assess the potential dust impacts to nearby residents and businesses that be generated from road construction works.

The Dust Assessment consists of real time data observation and discussion of the reported data to achieve the following objectives:

- Compliance with Tweed Valley Hospital Management Plan – Air Quality;
- Avoidance of excessive dust generation through site-works planning and the adoption of appropriate work methods and practices; and
- Prevention or minimisation to the greatest extent, the impact of construction dust on neighbours as well as establishing and maintaining positive relationships with project stakeholders.

This report details the compilation of the real time data on-site collected within close proximity to sensitive receptors and the successive dust assessment conducted by ADE throughout the month of **May 2023**.

Results from dust monitoring undertaken during the monitoring period of **May 2023** showed no exceedances of limits. Specifically, results, were **less than** 0.5 mg/m<sup>3</sup> and well below both the Action Limit of 2.5 mg/m<sup>3</sup> and exposure limit of 5 mg/m<sup>3</sup>. The outcome of the dust assessment for February did not identify exposures presenting an unacceptable risk to human health or the environment.

Works were understood only to be conducted between 6am and 6pm, Monday to Friday during the month of **May 2023**.

# 1 Introduction

## 1.1 Background

ADE was commissioned by Lendlease to measure the levels of dust at Tweed Valley Hospital Project, located at 771 Cudgen Road, Cudgen NSW (the Site). At the time of the dust monitoring, Lendlease are completing superstructure works which commenced in 2022. CD Civil has also been engaged to undertake civil works on the project. CD Civil are undertaking civil works on Cudgen Road which includes construction of permanent footpaths, road construction and widening.

Real time dust monitoring was carried out to establish and quantify the levels of dust generated during the days on which the contractors/employees have been undertaking these construction works. Three monitors have been used to measure dust concentration in the March monitoring period. All three (3) monitors are located on the southern side of Cudgen Road to evaluate dust generated from activities conducted during road constructions works. All monitoring locations were sited close to sensitive receptors (residential and business) close to active site works. The data recorded was assessed against the criteria and requirements set out in the Tweed Valley Hospital Management Plan – Air Quality.

**Table 1.** Summary of Site Information.

Site Details	
<b>Client Name:</b>	Lendlease
<b>ADE Project Number:</b>	A101021.0286.00
<b>Site Address:</b>	771 Cudgen Road, Cudgen NSW
<b>Monitoring Time and Dates:</b>	May 2023 (continuous): <ul style="list-style-type: none"> <li>▪ Day shift from 6.00am to 5.59pm</li> <li>▪ No night works were conducted during this monitoring period</li> </ul>
<b>Date of Report:</b>	2/08/2023
<b>Monitoring Parameters:</b>	<ul style="list-style-type: none"> <li>▪ Particulate Matter &lt;10 micrometres (PM10); and</li> <li>▪ Data recording frequency: 1 minute.</li> </ul>
<b>Exposure Standard:</b>	Australian Institute of Occupational Hygienists (AIOH) recommendation for PM10 Dust <b>5 mg/m<sup>3</sup></b> (expressed as 8-hour time weighted average) <sup>A</sup>

Note:

<sup>A</sup>: 2.5 mg/m<sup>3</sup> has been set as an Action Level to trigger consideration of controls to minimise the potential exceedance of the exposure standard.

## 1.2 Scope of Work

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In line with the criteria and requirements of the Air Quality section outlined in the Tweed Valley Hospital Management Plan and the current works on-site, the agreed scope of works is limited to the following:

- Completion of a Safety, Health & Environment Work Method Statement prior to undertaking any works;
- Real time continuous monitoring of PM10 in three (3) locations along the Southern boundary of Cudgen Road; and
- Preparation of an Environmental Dust Assessment Report reporting the site data against the management criteria and controls, as well as the provision of recommendations for future management.

## 1.3 Whole Report

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No one section or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendices and attachments.

## 1.4 Previous Report

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The dust assessment report for the previous monitoring round conducted in April 2023 reported no exceedance of environmental criteria and action criteria as set out in the Air Quality section of the Tweed Valley Hospital Management Plan. Refer to the previous report (A101021.0286.00 / EDM45 / Rev0) for detail relating to the April reporting period and earlier monitoring periods.

## 1.5 Monitoring Locations

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The Site is located at 771 Cudgen Road, bounded by Tweed Coast Road to the West, Turnock Street to the East and Cudgen Road to the South at Cudgen, NSW.

In 2019, the dust monitors were originally located along the northern alignment of Cudgen Road (i.e. Monitoring Site Location ID 001, 002 & 003). In January 2022, the dust monitors were relocated to the southern alignment of Cudgen Road in response to the program of works being undertaken by CD Civil at that time, and new monitoring location IDs were assigned (i.e. Monitoring Site Location ID 004, 005 & 006). In response to further scheduled road upgrade works being undertaken by CD Civil which commenced in December 2022, the Dust Monitor located at Monitoring Site 004 has been moved approximately 700-800m west along the road alignment and a new designator has been assigned to reflect this change in location (i.e. Monitoring Site 007). Monitoring Site 007 was established and came online on 08 December 2022. Monitoring Sites 005 and 006 remain in their designated locations as observed in January 2022.

All monitoring locations are within close proximity to the boundary of the nearest sensitive receptor (residential and businesses) that may be impacted by dust generated from the current roadworks program. Dust monitors at the current monitoring locations (i.e. Monitoring Site Location ID 005, 006 & 007) remain operational 24 hours a day. The location and duration of recording is in compliance with criteria and requirements set out in the Tweed Valley Hospital Management Plan – Air Quality.

**Table 2.** Summary of Monitor Locations.

Location	Start Date	End Date	Reason for Relocation
001	02/08/2019	11/01/2022	Relocated due to scheduled road upgrade works, being undertaken by CD Civil along Cudgen Road
002	31/09/2019	11/01/2022	Relocated due to scheduled road upgrade works, being undertaken by CD Civil along Cudgen Road
003	31/09/2019	11/01/2022	Relocated due to scheduled road upgrade works, being undertaken by CD Civil along Cudgen Road
004	11/01/2022	08/12/2022	Relocated due to scheduled road upgrade works, being undertaken by CD Civil along Cudgen Road
005	11/01/2022	-	-
006	11/01/2022	-	-
007	08/12/2022	-	-

Aerial imaging and monitoring location overview is presented in *Appendix I – Aerial Photograph* and *Appendix II – Monitoring Location*. ADE site visits are summarised in *Appendix III – ADE Site Visit Summary*.

## 1.6 Exposure Limits

ADE has adopted the recommended exposure standard for PM<sub>10</sub> as 5 mg/m<sup>3</sup> (8-hour time weighted average) as per the recommendation of the Australian Institute of Occupational Hygienists (AIOH) for works on-site. If this standard is exceeded works are to cease immediately. A review of controls and relevant practices will be undertaken as listed in the Tweed Valley Hospital Management Plan – Air Quality. An Action Limit of 2.5 mg/m<sup>3</sup> (8-hour time weighted average) has been implemented to trigger an alert to assess controls in place and minimise the likelihood of an exceedance.

## 1.7 Missing Data

### 1.7.1 Monitoring Location 005

Dust Monitor 005 was observed to be offline during the daily checks on 15 May 2023. ADE attended site on 17 May 2023 checking connections, status of the battery and repositioning of the solar panels. A power supply and connectivity issue was identified and resolved. The monitor came back online 17 May 2023.

### 1.7.2 Monitoring Location 006

During the reported monitoring period, no data gaps were recorded at Monitoring Location 006. All data from Dust Monitor 006 were correctly collected.

### **1.7.3 Monitoring Location 007**

During the reported monitoring period, no data gaps were recorded at Monitoring Location 007. All data from Dust Monitor 007 were correctly collected.



## 1.8 Bureau of Meteorology (BOM) Climate Data

A summary of climate data from the Coolangatta weather station has been included in **Table 3** below.

**Table 3.** Summary of May 2023 Climate Data at Coolangatta, QLD.

Date	Wind Direction	Highest Wind Gusts (Km/H)	Time of Maximum Wind Gust	Minimum Temperature (°C)	Maximum Temperature (°C)	Rain (Mm)
1	ENE	22	14:01	12.5	23.5	0.2
2	NNE	20	14:24	8.9	23	0
3	SSW	28	8:52	10.1	25.4	0
4	E	37	12:46	9.2	26	0
5	ESE	31	12:27	14.8	23.9	0
6	NE	24	12:26	11.5	24.6	0
7	N	35	13:28	14.3	26	0
8	SSW	46	0:40	5.2	22.8	1.2
9	S	31	9:40	3.8	22.5	0
10	S	41	11:15	12.7	23.4	0
11	SSE	35	10:53	14.9	23.3	2.4
12	ESE	37	11:35	14.4	23.4	0
13	ESE	43	16:09	14.2	23.5	0.6
14	SSE	31	12:05	16.5	22	0.6
15	S	30	19:03	16.4	21.8	11.6
16	ESE	54	2:23	16.4	19.9	117
17	SSW	46	10:41	15.3	22.4	10.4
18	SSW	35	1:14	14	21.3	0
19	SW	30	10:20	10	21	0
20	NNW	30	12:43	7.9	22.9	0
21	SSE	28	10:08	4.7	21.2	0
22	SSW	35	9:35	7	21.6	0
23	NNE	20	12:11	6.2	22.5	0
24	NE	22	12:46	10	22.8	0
25	N	28	12:47	9.8	23.4	0
26	NNW	35	10:57	12	24	0.2
27	SSW	44	5:26	14.7	21.6	0
28	NNE	24	14:14	8	21.6	0
29	SW	28	12:00	5.5	21.1	0
30	NNE	20	12:19	4.2	21.5	0
31	N	33	15:31	5.5	22.6	0

**Notes to Table**

ND – No Data provided by BOM.

## 2 Sampling Methodology

### 2.1 Air Monitoring Samples

Continuous dust monitoring was undertaken using a light scattering instrument (Dust Trak™ DRX Aerosol Monitor) at each monitoring location. All equipment is confirmed to be correctly calibrated and within the Calibration Certificate of Currency interval.

A summary of the dust monitoring equipment is provided in **Table 4** below.

**Table 4.** Dust equipment deployed

Make	Model	Location	Serial Number	Calibrated on	Calibration Due
DustTrak	8533	006	8533184203	17/02/2023	17/02/2024
DustTrak	8533	005	8533181801	24/02/2023	24/02/2024
DustTrak	8533	007	8533192607	03/05/2023	03/05/2024

### 2.2 Controls

As stated in Lendlease's Tweed Valley Hospital Management Plan – Air Quality, several controls to mitigate dust generation have been observed to be in place on-site during works.

*Works must be undertaken in accordance with the Lendlease GMRs, the Project EHS Plan, this Sub Plan and the Lendlease Building WDC. These documents detail Lendlease's approach and commitment to pro-active and responsible site management.*

*Site specific controls, monitoring, reporting and performance measures have been identified in this Sub Plan to prevent or minimise the impacts of construction related air emissions on the environment and community. These may include but are not limited to:*

- *Clear definition of trafficable and material storage areas to prevent unnecessary vehicle movement into other areas;*
- *Use of water cart to dampen work areas and exposed soils to prevent the emission of excessive dust;*
- *Installation of a wheel shaker grid and/or wash down facilities at the vehicle egress point;*
- *Ensuring trucks transporting materials to and from the site use covers to prevent windblown dust or spillage;*
- *Ensuring truck tailgate locking mechanisms are operational and in use;*
- *Periodic inspection of surrounding roads to ensure no construction contamination and initiation of road sweeping if required;*
- *Careful selection of materials for temporary road surfacing;*
- *Watercarts/water trucks will be in permanent use on site during excavation and civil works;*
- *Temporary stockpiles that are not required for imminent use will be stabilised with spray grass or appropriate fabric;*
- *Continuous monitoring of weather forecast to stop dust generating activities in case that high winds are expected;*
- *Before extended breaks (e.g., Easter, Christmas), areas will be treated with spray grass;*
- *Only those areas where immediate structures are to be build will be stripped. Areas will be stripped at the latest possible date to comply with the program;*

- *Construction haul roads and temporary carparking will maximise the use of permanent infrastructure. These roads/carparks will have a sacrificial seal to minimise dust generation;*
- *Subcontractors to maintain equipment / machinery to ensure exhaust emissions comply with relevant legislation and guidelines;*
- *All waste material to be sorted, collected and removed from site (for recycling where possible);*
- *If rock crushing is assessed to be safe and feasible (i.e. cost effective and meets Noise restrictions) the following management provisions will be in place:*
- *Rock crushers will have a water attachment for dust suppression at the source. The water is sprayed at the face of the crusher before, during and after the crushing;*
- *Crushers will be located as far as practicable from Cudgen Road and immediate neighbours (i.e., on the north-west area of the site);*
- *All crushed rock suitable for re-use will be recycled on site as fill, sediment control, pavements, hardstands, construction exits and pipe bedding materials;*
- *Where possible, the oversize material from hard rock projects is also reused for vehicle entry shake downs and erosion control;*
- *Air quality monitoring is required for dust only. Given all plant and equipment will be fitted with air filter caps, analytical air quality monitoring except for asbestos works is not required;*
- *Dust screens and airlocks to be utilised with interior works;*
- *Controlling dust close to its source by installing sprays and sprinkler systems to prevent off-site migration;*
- *Maintaining the site access to prevent dust generation and tracking off-site; and*
- *No blasting will be performed as part of the proposed construction works program.*

*Demolition (e.g., existing inground services), excavation and construction stage dust, odour and emission management requirements must be included in relevant specifications, contract agreements, quality assurance documents, and subcontractor work method statements.*

*Site inspections, monitoring and reporting will be undertaken by Lendlease and subcontractors as detailed in the Project EHS Plan and the following implementation table to ensure controls remain effective overtime.*

As an additional control to the dust monitoring program, Lendlease has established a daily check list providing confirmation that all monitors are operating in the field correctly, have adequate sunlight to power the units and that they are reporting consistently. It is understood that Lendlease will report issues immediately to ADE. Furthermore, ADE will conduct daily checks via telemetry to assess whether the monitors are operating and recording correctly. ADE are to advise Lendlease of issues immediately. As part of a management control in the monitoring program, the Dust Monitors will not be removed unless consultation with Lendlease, TSA Management and Health Infrastructure New South Wales has occurred and alternative locations are agreed upon.

## 2.3 Data Gaps

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Data gaps were identified at Monitoring Location 005 on the following dates (14 – 17 May 2023) due to insufficient power supply and poor connectivity and confirmed on-site when inspected by field personnel. Based on field observations recorded with the current works, historical data at the monitoring location and the absence of dust exceedances at surrounding dust monitoring locations during current works, ADE considers the likelihood of dust exceedances to have occurred at Monitoring Location 005 is very low to negligible. Restoration of continuous power supply and other measures have been undertaken to improve monitoring performance for the instrument at Monitoring Location 005. In-field testing has confirmed that the equipment at Monitoring Location 005 is online and operating correctly within the assigned parameters.

### 3 Data

Figures below show monthly dust results for each of the three (3) monitoring locations. All graphs below express dust levels as an hourly average and values <0.001 mg/m<sup>3</sup> will be recorded as 0 mg/m<sup>3</sup> and will not be graphed.



**Figure 1.** Summary of PM10 from the real time monitoring at location 005 – Solar Industry for the month of May 2023.



**Figure 2.** Summary of PM10 from the real time monitoring at location 006 – Mate and Matts for the month of May 2023.



**Figure 3.** Summary of PM10 from the real time monitoring at location 007 – Residential for the month of May 2023.

## 4 Conclusion & Recommendations

All measured PM<sub>10</sub> dust levels remained below 0.5 mg/m<sup>3</sup> during the month of May 2023 (*refer to Section 3*) at Monitoring Locations 005, 006 and 007. Recorded data from all monitoring locations were below the Action Limit of 2.5 mg/m<sup>3</sup>. It should be noted that the DustTrak records a minimum concentration reading of 0.001 mg/m<sup>3</sup> and values of lower concentration were recorded as zero.

Assessment of equipment performance and measures have been undertaken to improve the data collection at Monitoring Location 006. ADE has also assessed the performance of the equipment at the other monitoring locations. All equipment is performing within the assigned parameters for the monitoring program and compliance.

Consistent with previous reports, recommendations are to ensure adequate dust control measures continue to be implemented as per the Tweed Valley Hospital Management Plan – Air Quality and continue monitoring PM<sub>10</sub> for the duration of the project. If the action limit of 2.5 mg/m<sup>3</sup> (8-hour time weighted average) is exceeded, it is recommended that works are to cease and appropriate dust prevention techniques are to be identified and implemented. To reduce the likelihood of data gaps, daily on-site visual checks are to be undertaken by Lendlease accompanied by daily checks of the online telemetry by ADE.

## 5 Limitations

This report has been prepared for use by the client who has only commissioned the works in accordance with the project brief and the report contains information provided by the client. The advice herein relates only to this project and all results, conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, this report should not be used for any other purpose.

ADE Consulting Group Pty Ltd accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced or amended in any way without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

ADE's professional opinions are based upon its professional judgment, experience, training and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and / or opinions. ADE has limited investigation to the scope agreed upon with its client.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by a reputable member of the Environmental Industry within Australia. No other warranty, expressed or implied, is made or intended.

## 6 References

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- AIOH Position Paper, Dust not otherwise specified (Dust NOS) AND Occupational Health Issues, published by the Australian Institute of Occupational Hygienists (AIOH), May 2016.
- Australian Government, Bureau of Meteorology (BOM).
- Lendlease Building Pty Ltd Tweed Valley Hospital Management Plan – Air Quality.



# Appendix I – Aerial Photograph

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## Appendix II – Monitoring Locations

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Photograph 1: Representative photograph of monitoring location 005 – Solar Industry, as observed 17/05/2023





Photograph 2: Representative photograph of monitoring location 006 – Mate and Matts, as observed 17/05/2023



Photograph 3: Representative photograph of monitoring location 007 – Residential, as observed 17/05/2023

## Appendix III – ADE Site Visit Summary

Date of site visit	Time of site visit	Observations/Actions
03/05/2023	11:00 – 13:00	<ul style="list-style-type: none"> <li>Monitor inspection – check connections/reposition solar panels</li> </ul>
17/05/2023	12:00 – 15:00	<ul style="list-style-type: none"> <li>Noise/Vibration monthly calibrations, Dust monitor 005 – check connection/battery</li> </ul>
19/05/2023	15:30 – 17:00	<ul style="list-style-type: none"> <li>Noise/Vibration monitor 005 microphone inspection</li> </ul>
30/05/2023	13:00 – 14:00	<ul style="list-style-type: none"> <li>Noise/Vibration monitor 005 microphone cable replacement</li> </ul>



*Further details regarding ADE's services are available via*

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