



REPORT

Ambient Air Quality Monitoring (VOCs) Report – January 2022

Akzo Nobel Pty Ltd

Submitted to:

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Table of Contents

1.0 INTRODUCTION 1

2.0 SCOPE OF WORKS 1

 2.1 Monitoring Schedule 1

 2.2 Sampling Locations 1

3.0 TEST METHODS 2

4.0 UNCERTAINTY 2

5.0 AMBIENT AIR QUALITY CRITERIA 3

6.0 RESULTS 4

 6.1 VOCs 4

 6.2 Meteorological Conditions 5

7.0 DISCUSSION 7

8.0 IMPORTANT INFORMATION 7

TABLES

Table 1: Installation and Collection Dates 1

Figure 1: AkzoNobel fence line (green) and air quality (VOCs) sampling locations (labelled pins) 2

Table 2: Reporting Limits 2

Table 3: Analytical Uncertainty 3

Table 4: Ambient Air Quality Criteria for the AkzoNobel Air Quality Monitoring Program 3

Table 5: Round 45 – 05-01-2022 4

Table 6: Round 46 – 11-01-2022 4

Table 7: Round 47 – 17-01-2022 4

Table 8: Round 48 – 23-01-2022 5

Table 9: Round 49 – 29-01-2022 5

Table 10: Summary of Wind Conditions 5

Figure 2: Round 45 – 05-01-2022 6

Figure 3: Round 46 – 11-01-2022 6

Figure 4: Round 47 – 17-01-2022 6

Figure 5: Round 48 – 23-01-2022 6

Figure 6: Round 49 – 29-01-2022 6

Table 11: Summary7

FIGURES

Figure 1: AkzoNobel Fence Line (green) and Air Quality (VOCs) Sampling Locations (labelled pins)2
Figure 2: Round 45 – 05-01-20226
Figure 3: Round 46 – 11-01-20226
Figure 4: Round 47 – 17-01-20226
Figure 5: Round 48 – 23-01-20226
Figure 6: Round 49 – 29-01-20226

APPENDICES

APPENDIX A
Important Information

1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was commissioned by AkzoNobel Pty Ltd (AkzoNobel) to conduct an ambient air quality monitoring programme at the AkzoNobel site located at 51 McIntyre Road, Sunshine North (the site). The aim of the monitoring program was to assess Volatile Organic Compounds (VOCs) at the site boundary in accordance with the scope outlined in Golder Proposal No. 19130795-014-TM-Rev0, issued on 14/04/2021.

The assessment has been conducted in response to an Amended Clean Up Notice issued to AkzoNobel by the Environment Protection Authority (EPA VIC) issued on 24/12/2020 (CUN No. 90011933).

The following report describes the scope of works, test methods used, and the VOC monitoring results for January 2022.

2.0 SCOPE OF WORKS

2.1 Monitoring Schedule

The VOCs monitoring programme was conducted during January 2022 around the boundary of the AkzoNobel site in Sunshine North. The VOC monitoring consisted of samples being deployed on a 1-in-6-day sampling schedule for a period of 24 hours. The installation and collection dates for the samplers are presented in Table 1.

Table 1: Installation and Collection Dates

Round No.	Installation Date	Collection Date
45	Tuesday 4 th January 2022	Wednesday 5 th January 2022
46	Monday 10 th January 2022	Tuesday 11 th January 2022
47	Sunday 16 th January 2022	Monday 17 th January 2022
48	Saturday 22 nd January 2022	Sunday 23 rd January 2022
49	Friday 28 th January 2022	Saturday 29 th January 2022

2.2 Sampling Locations

Eight sampling locations were selected around the site boundary to represent and characterise the off-site emissions (Figure 1).



Figure 1: AkzoNobel Fence Line (green) and Air Quality (VOCs) Sampling Locations (labelled pins)

3.0 TEST METHODS

Toluene, ethyl benzene and total xylene isomers monitoring was carried out in accordance with Golder Associates Test Method No. P13, “Passive Gas Sampling: In Ambient Air by Radiello Passive Samplers”.

Diffusive samplers consist of a diffusive barrier through which gases of interest can pass to a separate sorbent section. Gases of interest diffuse across the barrier driven by a concentration gradient and are collected in the sorbent material. The sorbent section is then desorbed in a suitable solvent and analysed by gas chromatography with flame ionisation detection (GC-FID).

Table 2: Reporting Limits

Compound	Limit of Detection* (µg/m ³)
Toluene	10
Ethylbenzene	10
m,p-Xylene	10
o-Xylene	10

* Based on a 24-hour sampling period

4.0 UNCERTAINTY

Experiments conducted in a standard atmosphere chamber suggest that the calculated sampling rates for Radiello adsorbing cartridges seldom deviate by more than ±10% from the experimentally measured values.

The estimated measurement uncertainty for analysis of the target compounds on Radiello absorbing cartridges is ±10%. The specific measurement uncertainty for each compound is detailed in Table 3.

Table 3: Analytical Uncertainty

VOC Compound	Measurement Uncertainty
Ethylbenzene	2.5%
Toluene	1.5%
Xylene (m-, o- and p-)	2.5% (each)

5.0 AMBIENT AIR QUALITY CRITERIA

As part of the implementation of the Environment Protection Act 2017 which came into effect on 1 July 2021, the Environment Protection Authority, Victoria (EPA Vic), published the draft Guideline for assessing and minimising air pollution in Victoria, Publication 1961, May 2021 (draft guideline). The National Environmental Protection (Air Toxics) Measure, (NEPM (Air Toxics)), describes air quality objectives and sampling methodologies at sites where significantly elevated concentrations of one or more air toxics are expected to occur.

For the purposes of this assessment, the contaminants of interest (toluene, ethylbenzene and total xylene) observations will be compared directly to their corresponding NEPM (Air Toxics) criteria and Victoria Environment Protection Authority’s Draft Air Quality Assessment Criteria (AQAC) (Table 4).

Table 4: Ambient Air Quality Criteria for the AkzoNobel Air Quality Monitoring Program

VOC Compound	Averaging Period	NEPM (Air Toxics)	Draft Air Quality Assessment Criteria (AQAC)
		Concentration (µg/m ³)	
Toluene	24-hr	3766	
Ethylbenzene	24-hr		21712
Xylenes	24-hr	1085	8685

Notes: µg/m³ = micrograms per cubic metre of air at 25°C and 101.3 kPa

6.0 RESULTS

6.1 VOCs

The results of the VOC monitoring for toluene, ethylbenzene and total xylene isomers for each round of the monitoring programme are presented in Table 5 to Table 9.

Table 5: Round 45 – 05-01-2022

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2624	North West	04-01-2022 10:50	05-01-2022 11:08	<10	<10	<20
21-2625	North	04-01-2022 10:59	05-01-2022 11:14	<10	<10	<20
21-2626	North East	04-01-2022 11:10	05-01-2022 11:23	<10	<10	<20
21-2627	East	04-01-2022 11:17	05-01-2022 11:29	<10	<10	<20
21-2628	South East	04-01-2022 11:22	05-01-2022 11:35	<10	<10	<20
21-2629	South	04-01-2022 11:32	05-01-2022 11:42	<10	<10	<20
21-2630	South West	04-01-2022 11:38	05-01-2022 11:50	<10	<10	<20
21-2631	West	04-01-2022 11:47	05-01-2022 11:54	<10	<10	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.

Analysis commenced on 04-02-2022, conducted by Golder.

Table 6: Round 46 – 11-01-2022

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2666	North West	10-01-2022 10:57	11-01-2022 11:35	<10	<10	<20
21-2667	North	10-01-2022 11:06	11-01-2022 11:44	<10	37	130
21-2668	North East	10-01-2022 11:14	11-01-2022 11:54	<10	<10	<20
21-2669	East	10-01-2022 11:20	11-01-2022 12:00	<10	<10	<20
21-2670	South East	10-01-2022 11:30	11-01-2022 12:05	<10	<10	<20
21-2671	South	10-01-2022 11:38	11-01-2022 12:12	<10	<10	<20
21-2672	South West	10-01-2022 11:46	11-01-2022 12:19	<10	<10	<20
21-2673	West	10-01-2022 11:51	11-01-2022 12:24	<10	<10	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.

Analysis commenced on 04-02-2022, conducted by Golder.

Table 7: Round 47 – 17-01-2022

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2682	North West	16-01-2022 11:47	17-01-2022 12:37	<10	<10	<20
21-2683	North	16-01-2022 11:55	17-01-2022 12:43	<10	<10	<20
21-2684	North East	16-01-2022 12:03	17-01-2022 12:51	<10	<10	<20
21-2685	East	16-01-2022 12:10	17-01-2022 12:58	<10	<10	<20
21-2686	South East	16-01-2022 12:16	17-01-2022 13:02	<10	<10	<20
21-2687	South	16-01-2022 12:24	17-01-2022 13:09	<10	<10	<20
21-2688	South West	16-01-2022 12:30	17-01-2022 13:17	<10	<10	<20
21-2689	West	16-01-2022 12:37	17-01-2022 13:22	<10	<10	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.

Analysis commenced on 04-02-2022, conducted by Golder.

Table 8: Round 48 – 23-01-2022

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
22-20	North West	22-01-2022 10:51	23-01-2022 11:42	<10	49	120
22-21	North	22-01-2022 10:59	23-01-2022 11:48	<10	<10	<20
22-22	North East	22-01-2022 11:07	23-01-2022 11:55	<10	<10	<20
22-23	East	22-01-2022 11:15	23-01-2022 12:00	<10	<10	<20
22-24	South East	22-01-2022 11:22	23-01-2022 12:05	<10	<10	72
22-25	South	22-01-2022 11:31	23-01-2022 12:14	<10	<10	<20
22-26	South West	22-01-2022 11:38	23-01-2022 12:22	<10	<10	<20
22-27	West	22-01-2022 11:44	23-01-2022 12:26	<10	<10	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.

Analysis commenced on 04-02-2022, conducted by Golder.

Table 9: Round 49 – 29-01-2022

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
22-58	North West	28-01-2022 09:15	29-01-2022 10:14	<10	<10	<20
22-59	North	28-01-2022 09:22	29-01-2022 10:21	<10	<10	100
22-60	North East	28-01-2022 09:33	29-01-2022 10:29	<10	<10	<20
22-61	East	28-01-2022 09:40	29-01-2022 10:34	<10	<10	<20
22-62	South East	28-01-2022 09:46	29-01-2022 10:39	<10	<10	<20
22-63	South	28-01-2022 09:54	29-01-2022 10:46	<10	<10	<20
22-64	South West	28-01-2022 10:01	29-01-2022 10:51	<10	<10	<20
22-65	West	28-01-2022 10:08	29-01-2022 11:00	<10	<10	<20

Notes: Concentration expressed at 0°C and 101.325 kPa.

NR – no result due to analysis error

Analysis commenced on 04-02-2022, conducted by Golder.

6.2 Meteorological Conditions

The average meteorological conditions are summarised in Table 10. Wind rose plots for each sampling round are available Figure 2 to Figure 6.

Table 10: Summary of Wind Conditions

Round No	Start Date	End Date	Predominant Wind Direction (°)	Average Wind Speed (m/s)
45	04-01-2022	05-01-2022	S	2.0
46	10-01-2022	11-01-2022	S	2.2
47	16-01-2022	17-01-2022	S-SE	2.5
48	22-01-2022	23-01-2022	S-SE	1.6
49	28-01-2022	29-01-2022	S-SW	1.6

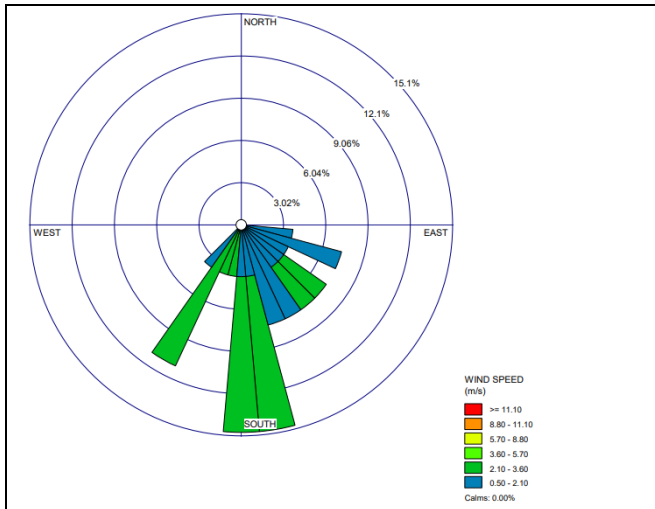


Figure 2: Round 45 – 05-01-2022

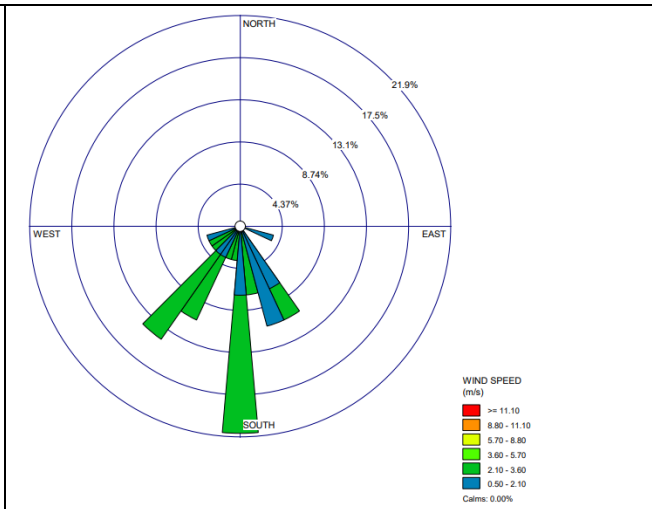


Figure 3: Round 46 – 11-01-2022

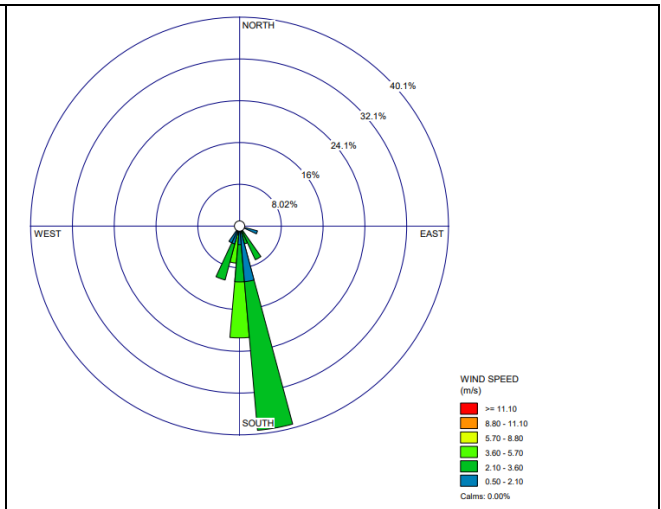


Figure 4: Round 47 – 17-01-2022

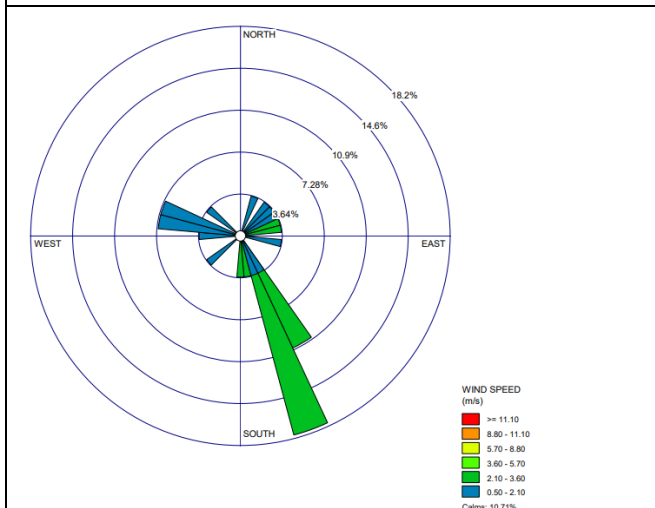


Figure 5: Round 48 – 23-01-2022

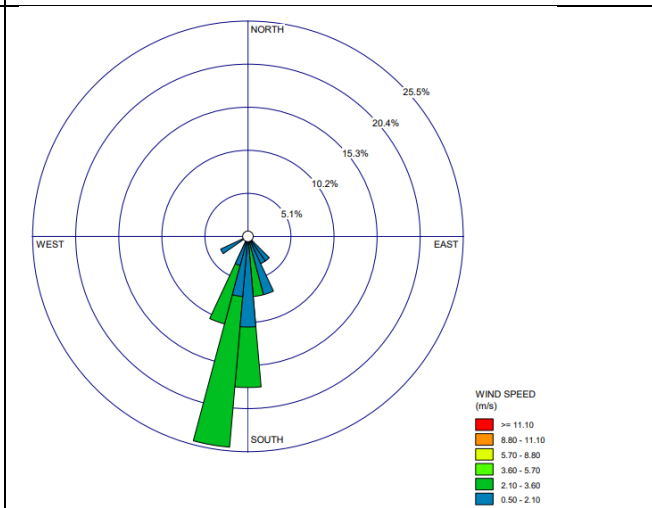


Figure 6: Round 49 – 29-01-2022

7.0 DISCUSSION

A summary of compounds detected above the method limit of detection, compared with the predominant wind direction and ambient air quality criteria is presented in Table 11.

Table 11: Summary

Location	Sample Date [#]	Concentration ($\mu\text{g}/\text{m}^3$)			Predominant Wind Direction
		Toluene	Ethylbenzene	Total Xylenes	
North	11-01-2022	<10	37	130	S
North West	23-01-2022	<10	49	120	S-SE
South East	23-01-2022	<10	<10	72	S-SE
North	29-01-2022	<10	<10	100	S-SW
Criteria (NEPM Air Toxics)		3766	NA	1085	
Criteria (Draft AQAC)		NA	21712	8685	

Notes: NA – Not applicable

– Sample end date

The VOC fence line monitoring conducted at AzkoNobel, Sunshine North, during January 2022 reported all results below the ambient air quality monitoring criteria for all reported compounds.

8.0 IMPORTANT INFORMATION

Your attention is drawn to the document titled – “Important Information Relating to this Report”, which is included in Appendix A of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder has under the contract between it and its client.

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APPENDIX A

Important Information

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