

REPORT

Ambient Air Quality Monitoring (VOCs) Report - November 2021

Akzo Nobel Pty Ltd

Submitted to:

Akzo Nobel Pty Ltd

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Sunshine North
3020 VIC

Submitted by:

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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 November 2021.

2.0 SCOPE OF WORKS

2.1 Monitoring Schedule

The VOCs monitoring programme was conducted during November 2021 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
35	Friday 5 th November 2021	Saturday 6 th November 2021
36	Thursday 11 th November 2021	Friday 12 th November 2021
37	Wednesday 17 th November 2021	Thursday 18 th November 2021
38	Tuesday 23 rd November 2021	Wednesday 24 th November 2021
39	Monday 29 th November 2021	Tuesday 30 th November 2021

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

Benzene, Toluene, Ethyl benzene, Xylene isomers (BTEX) 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 are allowed to 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: BTEX Reporting Limits

Compound	Limit of Detection* ($\mu\text{g}/\text{m}^3$)
Benzene	20
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 $\pm 10\%$ from the experimentally measured values.

The estimated measurement uncertainty for analysis of BTEX on Radiello adsorbing cartridges is $\pm 10\%$. 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 ($\mu\text{g}/\text{m}^3$)	
Toluene	24-hr	3766	
Ethylbenzene	24-hr		21712
Xylenes	24-hr	1085	8685

Notes: $\mu\text{g}/\text{m}^3$ = 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 35 – 06-11-2021

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2096	North West	05-11-2021 12:56	06-11-2021 13:40	<30	<30	<40
21-2097	North	05-11-2021 13:06	06-11-2021 13:47	<30	<30	<40
21-2098	North East	05-11-2021 13:13	06-11-2021 13:53	<30	<30	<40
21-2099	East	05-11-2021 13:21	06-11-2021 14:02	<30	<30	<40
21-2100	South East	05-11-2021 13:27	06-11-2021 14:06	<30	<30	<40
21-2101	South	05-11-2021 13:36	06-11-2021 14:13	<30	<30	<40
21-2102	South West	05-11-2021 13:43	06-11-2021 14:18	<30	<30	<40
21-2103	West	05-11-2021 13:50	06-11-2021 14:22	<30	<30	<40

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-12-2021, conducted by Golder Associates.

Table 6: Round 36 – 12-11-2021

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2139	North West	11-11-2021 11:13	12-11-2021 11:31	<30	<30	<40
21-2140	North	11-11-2021 11:21	12-11-2021 11:40	<30	<30	<40
21-2141	North East	11-11-2021 11:30	12-11-2021 11:49	<30	<30	<40
21-2142	East	11-11-2021 11:36	12-11-2021 11:59	<30	<30	<40
21-2143	South East	11-11-2021 11:43	12-11-2021 12:07	<30	<30	<40
21-2144	South	11-11-2021 11:52	12-11-2021 12:15	55	<30	<40
21-2145	South West	11-11-2021 11:58	12-11-2021 12:24	<30	<30	<40
21-2146	West	11-11-2021 12:03	12-11-2021 12:34	<30	<30	<40

Notes: Concentration expressed at 0°C and 101.325 kPa.
Analysis commenced on 15-12-2021, conducted by Golder Associates.

Table 7: Round 37 – 18-11-2021

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2173	North West	17-11-2021 11:46	18-11-2021 12:10	28	<30	<40
21-2174	North	17-11-2021 11:55	18-11-2021 12:17	68	<30	<40
21-2175	North East	17-11-2021 12:05	18-11-2021 12:25	<30	<30	<40
21-2176	East	17-11-2021 12:12	18-11-2021 12:32	38	<30	<40
21-2177	South East	17-11-2021 12:18	18-11-2021 12:38	<30	<30	<40
21-2178	South	17-11-2021 12:27	18-11-2021 12:43	<30	<30	<40
21-2179	South West	17-11-2021 12:39	18-11-2021 12:47	<30	<30	<40
21-2180	West	17-11-2021 12:47	18-11-2021 12:56	<30	<30	<40

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

Analysis commenced on 15-12-2021, conducted by Golder Associates.

Table 8: Round 38 – 24-11-2021

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2268	North West	23-11-2021 08:25	24-11-2021 08:11	<30	<30	<40
21-2269	North	23-11-2021 08:39	24-11-2021 08:16	<30	<30	<40
21-2270	North East	23-11-2021 08:49	24-11-2021 08:22	<30	<30	<40
21-2271	East	23-11-2021 08:48	24-11-2021 08:26	39	<30	<40
21-2272	South East	23-11-2021 09:06	24-11-2021 08:30	<30	<30	<40
21-2273	South	23-11-2021 09:16	24-11-2021 08:35	<30	<30	<40
21-2274	South West	23-11-2021 09:23	24-11-2021 08:40	57	<30	<40
21-2275	West	23-11-2021 09:32	24-11-2021 08:45	<30	<30	<40

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

Analysis commenced on 15-12-2021, conducted by Golder Associates.

Table 9: Round 39 – 29-11-2021

Sample No	Location	Sample period		Concentration ($\mu\text{g}/\text{m}^3$)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-2308	North West	29-11-2021 10:08	30-11-2021 11:08	<30	<30	<40
21-2309	North	29-11-2021 10:19	30-11-2021 11:17	47	<30	<40
21-2310	North East	29-11-2021 10:25	30-11-2021 11:25	<30	<30	<40
21-2311	East	29-11-2021 10:36	30-11-2021 11:31	<30	<30	<40
21-2312	South East	29-11-2021 10:43	30-11-2021 11:37	41	<30	<40
21-2313	South	29-11-2021 10:53	30-11-2021 11:44	<30	<30	<40
21-2314	South West	29-11-2021 11:01	30-11-2021 11:50	<30	<30	<40
21-2315	West	29-11-2021 11:08	30-11-2021 11:55	52	<30	<40

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

Analysis commenced on 15-12-2021, conducted by Golder Associates.

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)
35	05-11-2021	06-11-2021	N-NE	2.5
36	11-11-2021	12-11-2021	SE	3.2
37	17-11-2021	18-11-2021	N-NE	2.0
38	23-11-2021	24-11-2021	N-NE	2.1
39	29-11-2021	30-11-2021	S-SE	1.5

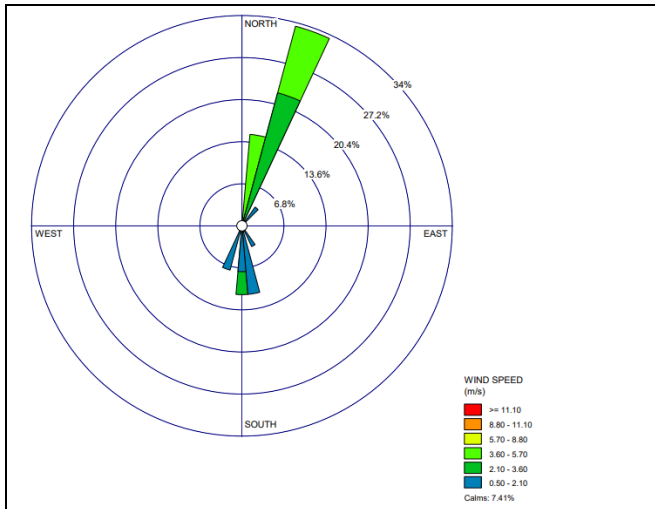


Figure 2: Round 35 – 06-11-2021

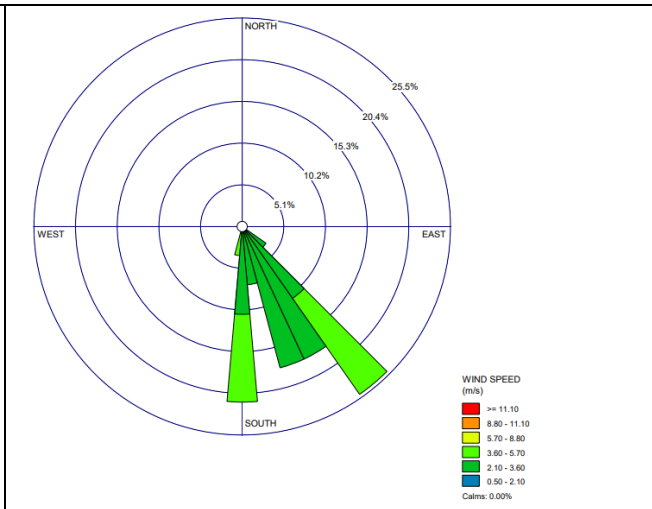


Figure 3: Round 36 – 12-11-2021

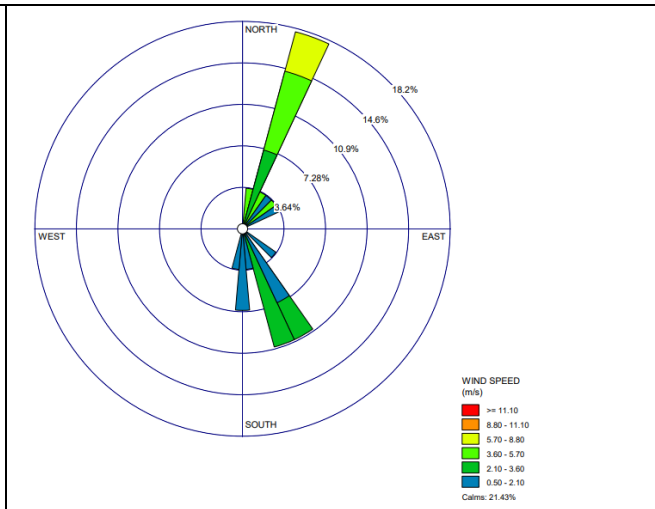


Figure 4: Round 37 – 18-11-2021

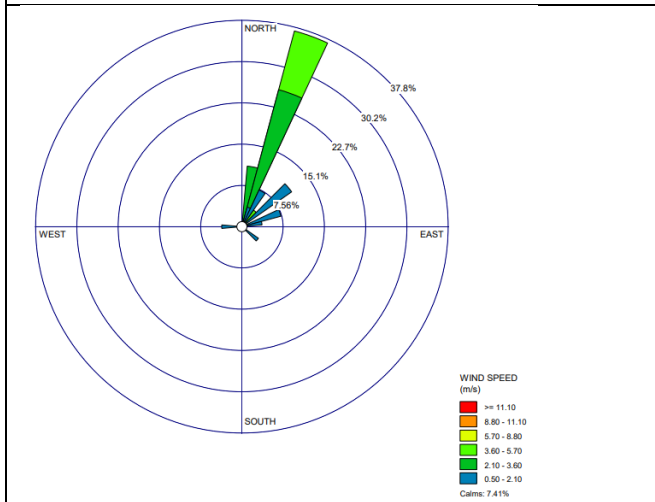


Figure 5: Round 38 – 24-11-2021

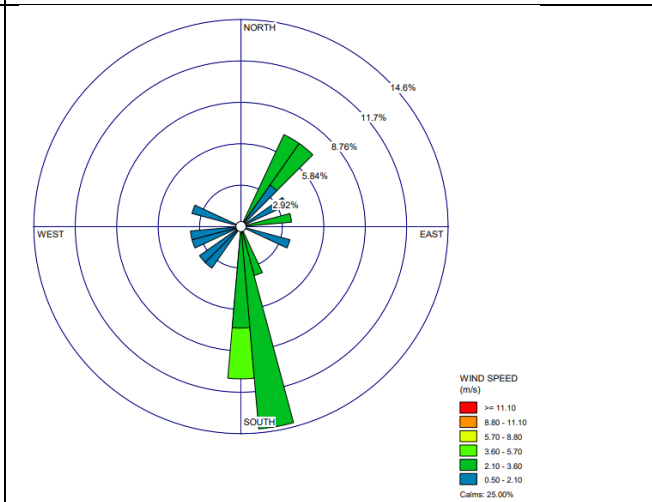


Figure 6: Round 39 – 30-11-2021

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	
South	12-11-21	55	<30	<40	SE
North West	18-11-21	28	<30	<40	N-NE
North	18-11-21	68	<30	<40	N-NE
East	18-11-21	38	<30	<40	N-NE
East	24-11-21	39	<30	<40	N-NE
South West	24-11-21	57	<30	<40	N-NE
North	30-11-21	47	<30	<40	S-SE
South East	30-11-21	41	<30	<40	S-SE
West	30-11-21	52	<30	<40	S-SE
Criteria (NEPM Air Toxics)		3766	NA	1085	
Criteria (Draft AQAC)		NA	21712	8685	

NA – Not applicable

The VOC fence line monitoring conducted at AzkoNobel, Sunshine North during November 2021 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 Associates has under the contract between it and its client.

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APPENDIX A

Important Information

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