GOLDER
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REPORT

Ambient Air Quality Monitoring (VOCs) Report - April 2021

Akzo Nobel Pty Ltd

Submitted to:

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Record of Issue

Company	Client Contact	Version	Date Issued	Method of Delivery	Amendment
AzkoNobel Pty Ltd	David Grubits	Rev0	10/06/2021	Electronic	Original

Distribution List

1x AkzoNobel Pty Ltd

1x Golder Associates Pty Ltd

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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 April 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 the period 15/04/2021 to 28/4/2021.

2.0 SCOPE OF WORKS

2.1 Monitoring Schedule

The VOCs monitoring programme was conducted during the month of April 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
1	Thursday 15th April 2021	Friday 16th April 2021
2	Wednesday 21st April 2021	Thursday 22nd April 2021
3	Tuesday 27th April 2021	Wednesday 28th April 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* ($\mu g/m^3$)
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 ± 10% from the experimentally measured values.

The estimated measurement uncertainty for analysis of BTEX 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

The National Environment Protection (Air Toxics) Measure (NEPC 1994) includes 24-hr criteria for toluene and total xylenes. There are no available NEPM (Air Toxics) criteria for ethylbenzene.

For the purposes of this assessment toluene and total xylene observations will be compared directly to their corresponding NEPM (Air Toxics) criteria (Table 4).

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

VOC Compound	NEPM (Air Toxics)	
	Averaging Period	Criteria ($\mu g/m^3$)
Toluene	24-hr	3766
Xylenes	24-hr	1085

Notes: $\mu g/m^3$ = 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 7.

Table 5: Round 1 – 16-04-2021

Sample No	Location	Sample period		Concentration (ug/m^3)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-643	West	15-04-2021 16:15	16-04-2021 16:20	<7	<6	<20
21-644	South West	15-04-2021 16:27	16-04-2021 16:25	<7	<6	<20
21-645	South	15-04-2021 16:38	16-04-2021 16:30	<7	<6	<20
21-646	South East	15-04-2021 16:50	16-04-2021 16:35	<7	<6	<20
21-647	East	15-04-2021 17:02	16-04-2021 16:41	<7	25	130
21-648	North East	15-04-2021 17:10	16-04-2021 16:43	<7	<6	27
21-649	North	15-04-2021 17:23	16-04-2021 16:49	<7	<6	<20
21-650	North West	15-04-2021 17:33	16-04-2021 16:54	<7	<6	<20

Notes: Concentration expressed at 0°C and 101.325 kPa. Analysis commenced on 01-06-2021, conducted by Golder Associates.

Table 6: Round 2 – 22-04-2021

Sample No	Location	Sample period		Concentration (µg/m^3)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-653	West	21-04-2021 07:35	22-04-2021 07:38	<20	<6	<20
21-654	South West	21-04-2021 07:40	22-04-2021 07:43	<20	<6	<20
21-655	South	21-04-2021 07:45	22-04-2021 07:47	<20	<6	110
21-656	South East	21-04-2021 07:53	22-04-2021 07:52	<20	<6	11
21-657	East	21-04-2021 07:59	22-04-2021 07:57	<20	<6	<20
21-658	North East	21-04-2021 08:04	22-04-2021 08:00	<20	<6	<20
21-659	North	21-04-2021 08:10	22-04-2021 08:07	<20	<6	<20
21-660	North West	21-04-2021 08:17	22-04-2021 08:12	<20	<6	<20

Notes: Concentration expressed at 0°C and 101.325 kPa. Analysis commenced on 01-06-2021, conducted by Golder Associates.

Table 7: Round 3 – 28-04-2021

Sample No	Location	Sample period		Concentration (µg/m³)		
		Start	End	Toluene	Ethylbenzene	Total Xylenes
21-710	West	27-04-2021 13:25	28-04-2021 13:40	<7	<6	<20
21-711	South West	27-04-2021 14:43	28-04-2021 13:45	<7	<6	<20
21-712	South	27-04-2021 13:36	28-04-2021 13:48	<7	<6	<20
21-713	South East	27-04-2021 13:42	28-04-2021 13:53	<7	<6	<20
21-714	East	27-04-2021 13:57	28-04-2021 13:56	<7	<6	<20
21-715	North East	27-04-2021 14:05	28-04-2021 14:00	<7	<6	<20
21-716	North	27-04-2021 14:16	28-04-2021 14:06	<7	13	81
21-717	North West	27-04-2021 14:27	28-04-2021 14:12	<7	<6	<20

Notes: Concentration expressed at 0°C and 101.325 kPa. Analysis commenced on 01-06-2021, conducted by Golder Associates.

6.2 Meteorological Conditions

The average meteorological conditions are summarised in Table 8. Wind rose plots for each sampling round are available in Figure 2 to Figure 4 below.

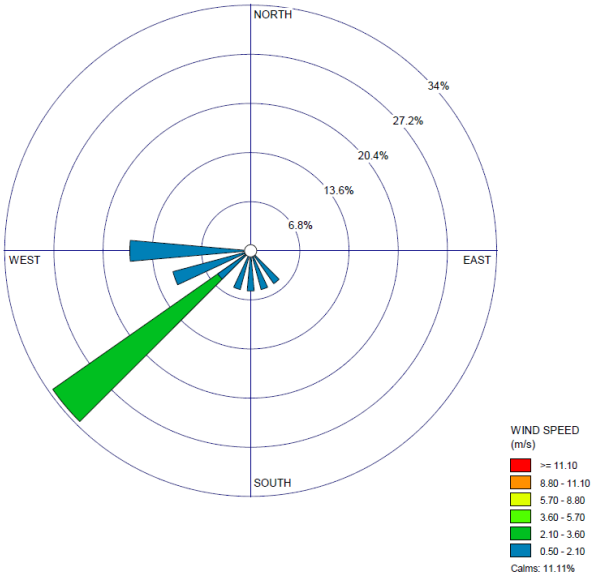

Figure 2: Round 1 – 16-04-2021

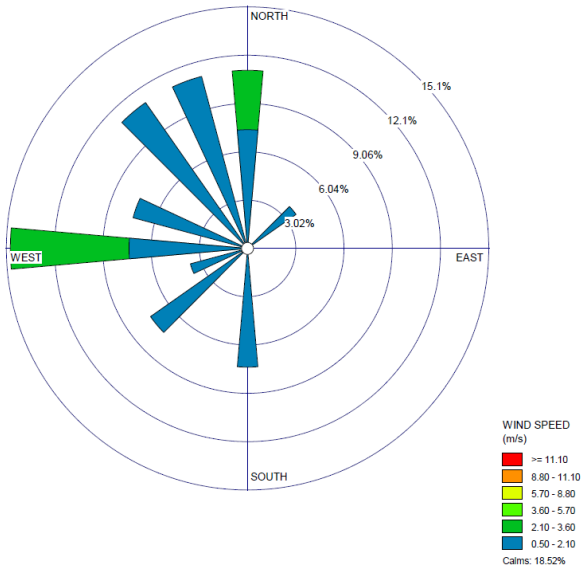

Figure 3: Round 2 – 22-04-2021

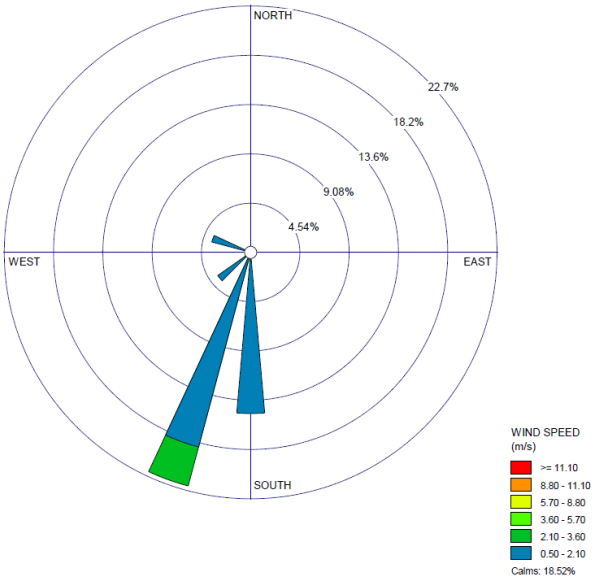

Figure 4: Round 3 – 28-04-2021

Table 8: Summary of Wind Conditions

Round No	Start Date	End Date	Predominant Wind Direction (°)	Average Wind Speed (m/s)
1	15-04-2021	16-04-2021	SW to W	1.8
2	21-04-2021	22-04-2021	W to N	1.3
3	27-04-2021	28-04-2021	S to SSW	0.65

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 9.

Table 9: Summary

Location	Sample Date	Concentration (µg/m^3)			Predominant Wind Direction
		Toluene	Ethylbenzene	Total Xylenes	
East	16-04-2021	<7	**25**	**130**	SW to W
North East	16-04-2021	<7	<6	**27**	SW to W
South	22-04-2021	<20	<6	**110**	W to N
South East	22-04-2021	<20	<6	**11**	W to N
North	28-04-2021	<7	**13**	**81**	S to SSW
Criteria		**3766**	**NA**	**1085**	

The VOC fence line monitoring conducted at AzkoNobel, Sunshine North during the month of April 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.

Signature Page

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https://golderassociates.sharepoint.com/sites/115853/project files/6 deliverables/015-r-vocs monitoring - april 2021/19130795-015-r-rev0_vocs monitoring - april 2021.docx

APPENDIX A

Important Information

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