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Memorandum

To	[REDACTED]	From	[REDACTED]
Copy	[REDACTED]	Reference	P509485
Date	2024-06-25	Pages (including this page)	15
Subject	Colac Quarry, Northern Development Area (NDA): Further Information Regarding Air Quality Assessment		

This memo has been prepared for Holcim (Australia) Pty Ltd (Holcim) to provide further information to Environment Protection Authority Victoria (EPAV) in relation to air quality and Work Authority Application WA7635. This is in part to provide further information to EPAV as an outcome to a meeting between Holcim and EPAV on the 27 May 2024, and in a letter provided by EPAV on 14 May 2024.

1 Introduction

The purpose of this memo is to provide further information in respect to the following matters relating to air quality that were previously discussed at the meeting on the 27 May 2024:

- Information on the assessment approach in respect to air quality in respect to risks to harm to human health and the environment; including sensitive receptors.
- Summary of environmental controls and how these controls address potential impacts.
- Information on the existing quarry (WA158) PM10 data, including the collection methodology and monitoring location.
- Information in respect to Respirable Crystalline Silica (RCS) to provide justification as to why Holcim do not consider an initial sampling program for RCS is warranted.

If any of the above requests have been misinterpreted, or if any information provided is unclear, Holcim welcome any further engagement with EPAV.

2 Further Information

The requested information for air quality is provided in the subsequent sections.

2.1 Sensitive Receptors

A location plan of the sensitive receptors is provided in **Attachment 1**. In all but one case, the NDA quarry extension meets the buffer distances defined within the *EPA Publication 1518: Recommended Separation Distances for Industrial Residual Air Emissions – Guideline* (7 March 2013) which specifies a separation distance for extractive industries of 500m for extractive industries where blasting is proposed. Whilst this guideline is from 2013, it is also referenced in more recent guidance, including *EPA Publication 1823.1: Mining and quarrying - guide to preventing harm to people and the environment* (6 July 2021).

The dwelling within 500m is 230 Ondit Warrion Road (refer to **Attachment 1 and 3**). As it currently stands, the house at 230 Ondit Warrion Road is dilapidated and not used as a residential dwelling and has been unoccupied for over 15 years. Recent engagement with the landowner have indicated there are no current plans to develop the dwelling into a residential premises. The land is currently leased to a nearby farmer and utilised for agricultural purposes.

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Holcim consider this point important in the assessment of potential risks to human health and the environment. However, for the purposes of the AQIA, Holcim have taken a precautionary approach to considering the possibility that this may become a sensitive receptor in the longer term future.

2.2 Air Quality Controls

The Work Plan already contains an Air Quality risk treatment plan (Section 3.4.1); which identifies risks, controls, monitoring and reporting related to air quality. These are summarised in in Table 2-1 and monitoring in Table 2-2.

Furthermore, the quarry will be progressively rehabilitated which will minimise land disturbance. Extraction will occur in four stages (West to East in Stages 1 to 4), over an approximate extraction period of 20 years; the rehabilitation plan includes measures to progressively rehabilitate the terminal batters as soon as practicable. This will include ongoing maintenance/ monitoring of revegetated areas to promote vegetation growth. These controls are aligned to *EPA Publication 1823.1: Mining and quarrying - guide to preventing harm to people and the environment (6 July 2021)*.

It is noted, that the AQIA did not specifically consider all these controls in the modelling; however, some dust suppression was considered as a reduction measures (refer to AQIA, Appendix B – Emissions Inventory). Holcim consider that these controls are part of demonstrating Holcim's obligations relating to the GED. The effectiveness of controls (as per the existing quarry) will be reviewed in the event of any community or public complaints.

Table 2-1: Work Plan (Air Quality Controls)

#	Details of controls being used	Performance standards/measures
1	Enclose dust generating equipment (e.g. crushers, conveyors) or fit them with suppression devices to minimise dust emissions. Maintain enclosures or suppression devices to ensure they are operating effectively.	Dust suppression devices fitted to all operating dust-generating plant. High level of plant enclosure.
2	Stop dust generating activities (e.g. crushing) where dust suppression devices are not fitted or not operating correctly during very windy conditions.	Dust generating activities not undertaken when wind speeds \geq 60 km/h if dust suppression equipment is not operating correctly
3	Manage onsite roads located within 500m of a sensitive receptor to minimise dust generation, for example, by gravelling the road or use of water, polymer, or other chemical dust suppressants. Polymer or chemical suppressants to be subject to relevant environmental contamination controls.	Water or chemical dust suppressants are used on onsite roads within 500m from a sensitive receptor.
4	Stabilise soil and overburden stockpiles (e.g. seeded / roughened / mulched) if they will not be disturbed for an extended period. Water or use other dust suppressant agents to prevent dust generation prior to stabilisation.	Soil and overburden stockpiles stabilised or watered if not used for 60 days.
5	Cover vehicles carrying dusty materials (soil, sand, rocks etc.) when transferring material to/from the site or treat with water or other dust suppressant to minimise dust generation.	Ensure all vehicles have loads covered or wetted when exiting site to transfer materials.
6	Install and use wheel wash and/or rumble grids for use by trucks at their main exit points.	Wheel wash / rumble grids installed at all site exits.
7	Limit vehicle movements on unsealed or untreated roads/areas to avoid dust generation during windy conditions.	Vehicle movements limited to sealed/watered roads under windy conditions (\geq 60 km/h)

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8	Establish, signpost, and enforce speed limits to minimise dust generation from vehicles on roads that are prone to dust generation.	Set a 40 km/h or lower speed limit on unsealed roads within the NDA.
9	Maintain regular communication with owner at 230 Ondit-Warrion Rd to establish if the dwelling becomes occupied. Where, 230 Ondit Warrion Road becomes occupied peak load activities shall be avoided during times when stronger winds are blowing from the north-east. During stronger north easterly winds, site operations must be limited to typical levels of activity (i.e. approximately 33 truckloads of material being hauled between the NDA and the existing quarry site WA158).	No community complaints from dust emissions from the Quarry.

Table 2-2: Work Plan (Air Quality Monitoring)

#	Aspect to be monitored	Details of monitoring
1	Dust deposition at nearest sensitive residential locations in the event of a community complaint.	Monitor continuously for 3 months following dust complaint, following applicable EPA guidance.
2	Excessive visible dust being generated on site	Visual observation during windy conditions
3	Community Complaints	Register of stakeholder and community complaints

2.3 Existing Monitoring Data

Holcim engage Blue Atmosphere to maintain the air quality monitoring station (AQMS) at the existing quarry (WA158) and prepare monthly reports. The location of the existing WA158 AQMS is shown in **Attachment 2**.

The station employs a PM10 monitor - Tapered Element Oscillating Microbalance (TEOM) manufactured by Thermo, with incorporated Ambient Temperature, Relative Humidity and Ambient Pressure, and a separate RM Young wind sensor. The data is logged by an EviDAS Data Logger and data is downloaded every 15 minutes to a database managed by Envista ARM Software. The station is maintained monthly, and the recorded data is checked daily.

A 12 monthly summary report has been prepared and is provided in **Attachment 6**; which covers a period of May 2023 to April 2024. This included an exceedance of the 50µg/m³ criteria on the 28 February 2024. It is noted, that the current AQMS is within the WA158 quarry boundary, and therefore PM10 concentrations are likely higher than that of the sensitive receptors due to the proximity to the source.

The RWDI (2023) NDA Air Quality Impact Assessment (AQIA) which utilised the Geelong South AQMS conservatively indicates that there is modelled exceedances are based on peak operations when background levels are at their highest, where R1 would marginally exceed 1 day per year (52 µg/m³, which is 2µg/m³ above the criteria of 50 µg/m³), and R2 would exceed 5 days per year. A comparison of the 1-hourly average PM10 dataset in the 2022 reporting period has been undertaken (refer to Attachment 4). For the reporting period, in general the Geelong South data had a slightly higher average than the WA158 AQMS (17.37µg/m³ compared to 12.31µg/m³); however, the WA158 had higher maximum values, namely in the summer period which are likely attributable to site activities.

The NDA is not considered to have major operational change that will materially change the cumulative impact of the site in respect of air quality, given the overall capacity of the quarry will not be increasing. Primary and secondary crushing plant will move and occur in the NDA, with material then

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being transported via truck movements to the existing fixed tertiary screening plant on the existing Holcim quarry site.

On the basis of the above, it is considered that the AQIA is representative of the site conditions when compared to the last 12 months of data and that the site data obtained provides a level of validation that the assessment approach was appropriate. Furthermore, Holcim have not had a complaint in relation to dust or air quality impacts from the existing quarry in over 10 years.

2.4 Respirable Crystalline Silica (RCS)

Holcim have previously disagreed with EPA's position that an initial sampling program is required for RCS. This is on the basis that the basalt mined at the site has negligible free silica content, as confirmed by the petrographic analysis which confirmed the free silica content is estimated a <1%. This analysis has previously been provided to EPAV, and is included in the AQIA (RWDI, 2023).

However, as part of Holcim's ongoing Occupational Health and Safety monitoring program, Holcim do undertake monitoring for respirable dust and RCS. This monitoring is an occupational exposure assessment or Quartz (RCS) performed in accordance with the requirements of the *Occupational Health and Safety Regulations 2017 (VIC) and AS2985-2009 Workplace atmospheres—Method for sampling and gravimetric determination of respirable dust*.

The reports cannot be provided to EPAV for privacy reasons; however the results from 2018-2022 have been provided in **Attachment 5**. Whilst there are detections of RCS on workers, all samples are well below the occupational exposure standards for respirable dust (3mg/m³) and respirable crystalline silica dust (0.05mg/m³). Recent statistical analysis of dust data for Colac Quarry states that no similar exposure groups (SEG's) identify as high risk crystalline silica dust.

On the basis of the above, Holcim consider that there is negligible risk associated with RCS to receptors at the existing quarry and proposed NDA; and that no additional RCS testing is required.

3 Conclusion

Holcim have provided additional information to the concerns raised by EPAV. Holcim consider that the risks associated with air quality have been appropriately captured in the AQIA and Work Plan; and the controls are proportionate to the risks posed to the environment and human health and in line with GED requirements.

Should EPAV have any additional queries relating to Air Quality, Holcim are happy to discuss.

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Attachment 1: Location Plan

aurecon



Legend

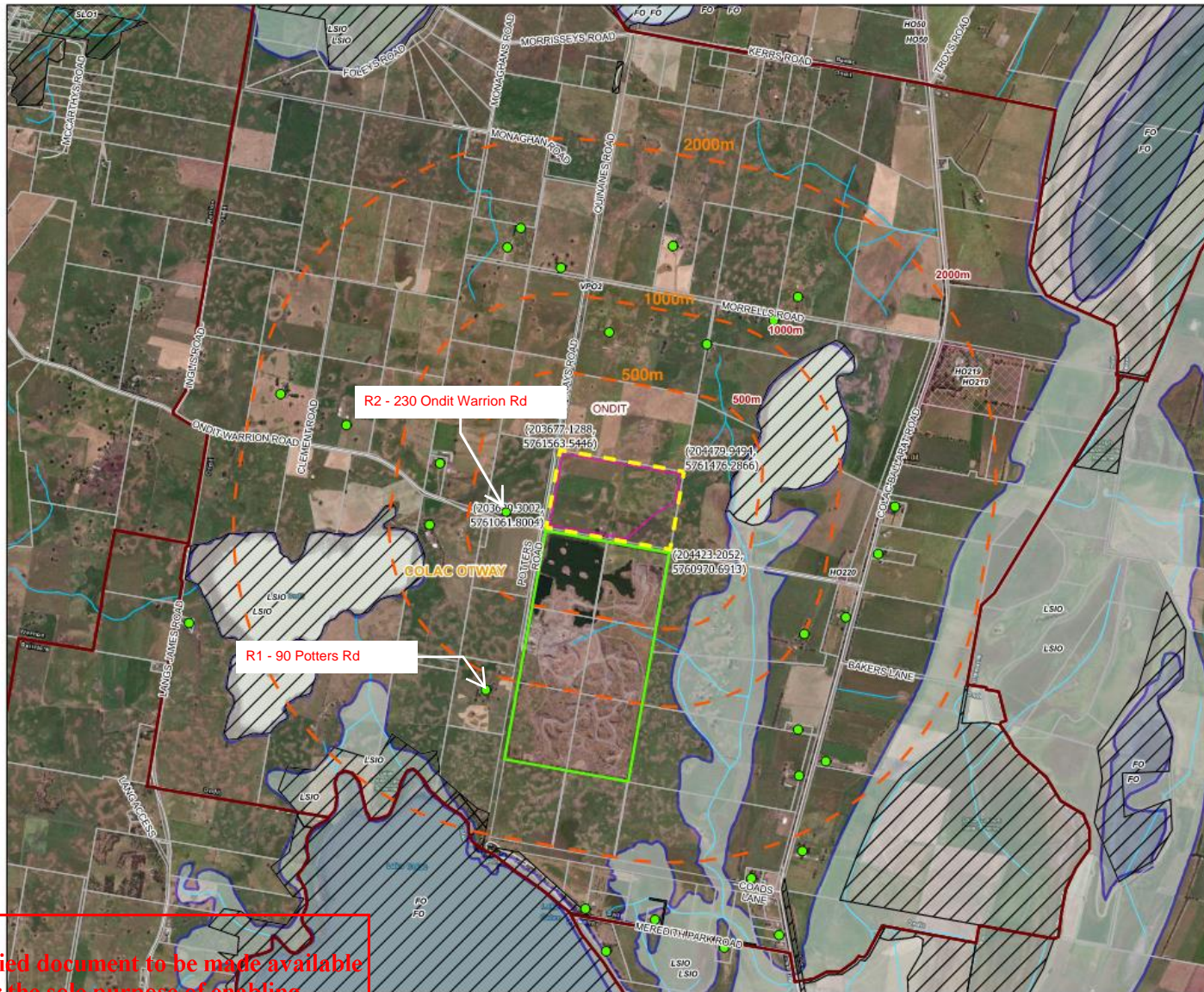
- Residential receptors
- Limit of Extraction
- Work Authority Boundary
- Existing Site
- Locality Boundary
- Environmental and Landscape
- SLO - SIGNIFICANT LANDSCAPE
- VPO - VEGETATION PROTECTION
- Heritage and Built Form
- HO - HERITAGE Land Management
- FO - FLOODWAY
- LSIQ - LAND SUBJECT TO INUNDATION
- Crown Land (No unrestricted / unavailable land within map boundary)
- Cadastre
- LGA
- Watercourse

Data Source: VicMap (2020); Aurecon (2020)
 Image: Digital Cadastral Database; Regional Ecosystem Mapping (Version 6.1); High Value Regions (Version 2.1) - Department of Environment and Resource Management.

Date: 17/05/2023 Version: 1

Holcim Colac Quarry Extension

Location Plan #1



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Scale: 1:25,000
 Drawing No: 509485
 Coordinate System: DA 1994 MGA Zone 54

Attachment 2: WA158 AQMS Location (Source - Google Earth)

AQMS location (38°15'27.10"S, 143°36'43.72"E) ~150m south of operational areas



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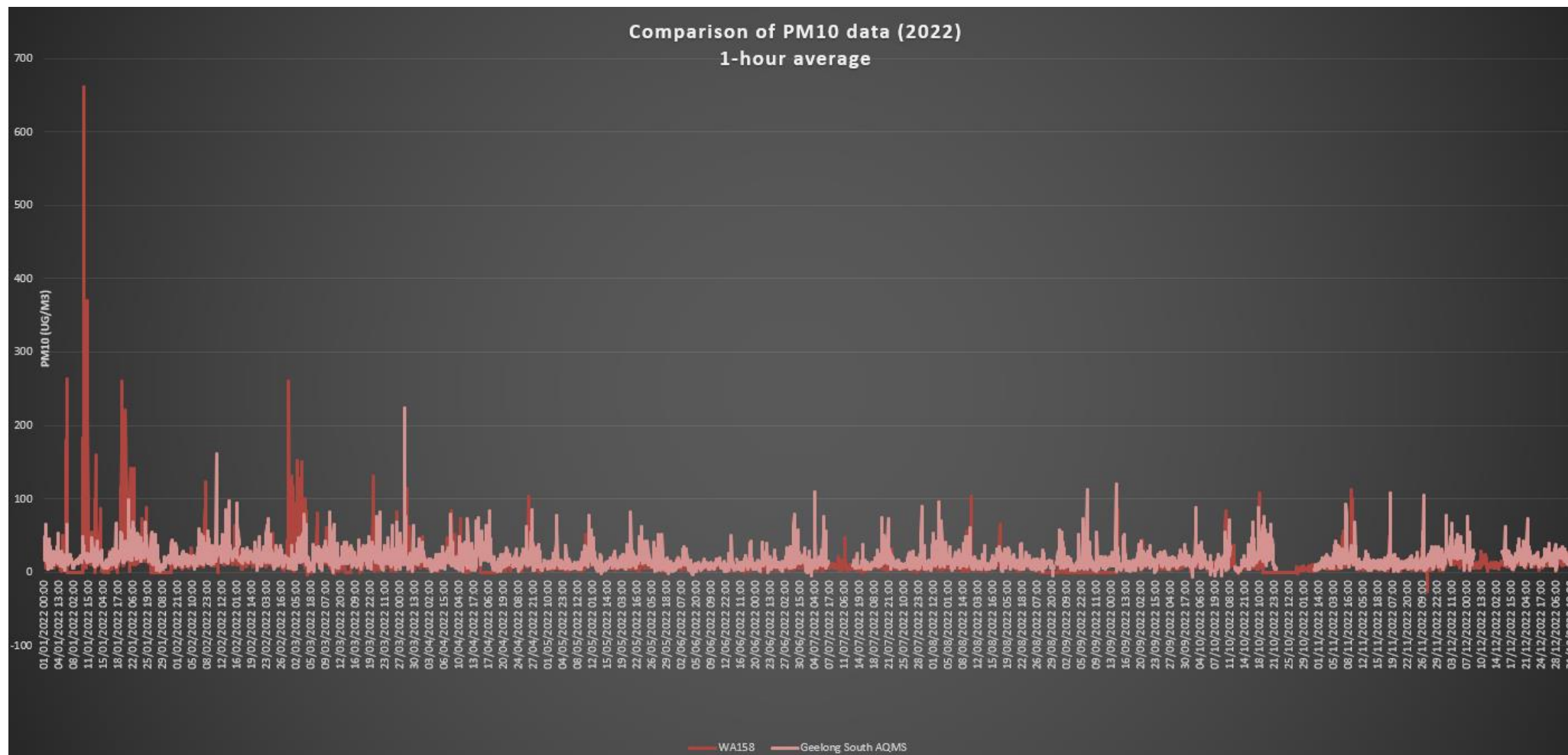
Attachment 3: 230 Ondit Warrion Road (Source - Google Maps)



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Attachment 4: Graph comparison of AQ data (2022 period)



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BU	State	Site	Type of Operation	Date sampled (dd/mm/yyyy)	Year	Unique Sample ID	Holcim Primary SEG Code	Worker Primary Activity	Worker Secondary Activity	Task / work activities performed	Respirable Dust Concentration (mg/m3)	Shift adjusted OEL for respirable dust	Respirable Crystalline Silica (mg/m3)	Shift adjusted OEL RCS (mg/m3)	OEL Adjustment method (select from list)
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE84	Q2	Face Loader Operator	Nil	Face Loader Operator	0.11	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE89	Q3	Primary Haul Truck Operator	Nil	Primary Haul Truck Operator	0.1	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE50	Q4	Crusher Operator	Nil	Crusher Operator	0.26	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE53	Q5	Sales Loader Operator	Nil	Sales Loader Operator	0.1	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE60	Q5	Sales Loader Operator	Nil	Sales Loader Operator	0.1	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE124	Q7	Quarry Manager	Site inspections	Quarry Manager	0.12	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE112	Q8	Mobile crusher operator	Nil	Mobile crusher operator	0.23	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE68	Q10	Quality Technician	Nil	Quality Technician	0.3	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE20	Q13	Maintenance Worker	Nil	Maintenance Worker	0.14	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	12/10/2018	2018	RHSE117	Q16	Weighbridge Operator	Nil	Weighbridge Operator	0.14	1.8	<0.01	0.06	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/10/2019	2019	S217743	Q8	Mobile crusher operator	Nil	Mobile crusher operator	0.18	2.2	0	0	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/10/2019	2019	S217730	Q17	Excavator Operator (Not Rock Pick)	Nil	Excavator Operator (Not Rock Pick)	0.24	2.2	0	0	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/10/2019	2019	S217729	Q5	Sales Loader Operator	Nil	Sales Loader Operator	0.16	2.2	0	0	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/10/2019	2019	S217733	Q13	Maintenance Worker	Nil	Maintenance Worker	0.81	3	0	0	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/10/2019	2019	S217725	Q8	Mobile crusher operator	Nil	Mobile crusher operator	0	0	0	0	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/10/2019	2019	S217724	Q13	Maintenance Worker	Nil	Maintenance Worker	0	0	0	0	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	15/11/2021	2021	Rass119	Q13	Maintenance - Fitter	Nil	Maintenance - Fitter	0.1	2.19	<0.0043	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	15/11/2021	2021	Rass90	Q5	Sales Loader Operator	Nil	Sales Loader Operator	<0.1	2.19	<0.0045	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	15/11/2021	2021	Rass132	Q16	Weighbridge Operator	Nil	Weighbridge Operator	<0.1	2.19	<0.0043	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	15/11/2021	2021	Rass26	Q8	Mobile crusher operator	Nil	Mobile crusher operator	<0.1	2.19	<0.0049	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	15/11/2021	2021	Rass102	Q21	Front End Loader Operator	Nil	Front End Loader Operator	<0.1	2.19	<0.0049	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	15/11/2021	2021	Rass117	Q5	Sales Loader Operator	Nil	Sales Loader Operator	<0.1	2.19	<0.0073	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass89	Q13	Maintenance - Fitter	Nil	Maintenance - Fitter	<0.1	2.19	<0.0039	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass77	Q13	Maintenance - Boilermaker	Nil	Maintenance - Boilermaker	0.2	2.19	<0.0050	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass10	Q8	Mobile crusher operator	Nil	Mobile crusher operator	<0.1	2.19	<0.0046	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass16	Q3	Primary Haul Truck Operator	Nil	Primary Haul Truck Operator	<0.1	2.19	<0.0046	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass120	Q21	Front End Loader Operator	Nil	Front End Loader Operator	<0.1	2.19	<0.0046	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass5	Q16	Weighbridge Operator	Nil	Weighbridge Operator	<0.1	2.19	<0.0046	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass38	Q8	Mobile crusher operator	Supervisor	Mobile crusher operator	0.3	2.19	<0.0042	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	16/11/2021	2021	Rass21	Q5	Sales Loader Operator	Nil	Sales Loader Operator	<0.1	2.19	<0.0047	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	17/01/2022	2022	Rass283	Q16	Weighbridge Operator	Nil	Weighbridge Operator	<0.1	2.19	<0.0042	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	17/01/2022	2022	Rass262	Q5	Sales Loader Operator	Nil	Sales Loader Operator	<0.1	2.19	<0.0045	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	17/01/2022	2022	Rass286	Q15	Water Cart	Q3	Water Cart	<0.1	2.19	<0.0040	0.036	AIOH modified Quebec model
Aggregates	VIC	Colac Quarry	Hard Rock	17/01/2022	2022	Rass22	Q8	Mobile crusher operator	Nil	Mobile crusher operator	<0.1	2.19	<0.0042	0.036	AIOH modified Quebec model

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Aggregates	VIC	Colac Quarry	Hard Rock	17/01/2022	2022	Rass281	Q13	Maintenance - Boilermaker	Nil	Maintenance - Boilermaker	0.2	2.19	<0.0053	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	17/01/2021	2022	Rass250	Q21	Front End Loader Operator	Nil	Front End Loader Operator	<0.1	2.19	<0.0057	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass217	Q21	Front End Loader Operator	Nil	Front End Loader Operator	<0.1	2.19	<0.0033	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass139	Q13	Maintenance - Boilermaker	Nil	Maintenance - Boilermaker	0.1	2.19	<0.0032	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass97	Q5	Sales Loader Operator	Nil	Sales Loader Operator	<0.1	2.19	<0.0036	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass243	Q16	Weighbridge Operator	Nil	Weighbridge Operator	<0.1	2.19	<0.0035	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass1	Q7	Supervisor	Nil	Supervisor	<0.1	2.19	<0.0033	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass50	Q8	Mobile crusher operator	Nil	Mobile crusher operator	<0.1	2.19	<0.0039	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	18/01/2022	2022	Rass221	Q15	Water Cart	Nil	Water Cart	<0.1	2.19	<0.0033	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	21/02/2022	2022	RASS363	Q16	Weighbridge Operator	Nil	Weighbridge Operator	<0.1	2.19	<0.0045	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	21/02/2022	2022	RASS307	Q7	Supervisor	Q15	Supervisor	<0.1	2.19	<0.0045	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	21/02/2022	2022	RASS348	Q8	Mobile crusher operator	Nil	Mobile crusher operator	<0.1	2.19	<0.0048	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	21/02/2022	2022	RASS353	Q21	Front End Loader Operator	Nil	Front End Loader Operator	<0.1	2.19	<0.0048	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	22/02/2022	2022	RASS358	Q16	Weighbridge Operator	Nil	Weighbridge Operator	<0.1	2.19	<0.0045	0.036	AIOH modified Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	22/02/2022	2022	RASS314	Q13	Maintenance - Boilermaker	Nil	Maintenance - Boilermaker	<0.1	2.19	<0.0042	0.036	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	22/02/2022	2022	RASS364	Q5	Sales Loader Operator	Nil	Sales Loader Operator	<0.1	2.19	<0.0051	0.036	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	22/02/2022	2022	RASS339	Q7	Supervisor	Q3	Supervisor	<0.1	2.19	<0.0047	0.036	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS359	Q5	Sales Loader Operator	N/A	Sales Loader Operator	<0.10	2.4	<0.0029	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS350	Q5	Sales Loader Operator	N/A	Sales Loader Operator	0.11	2.11	<0.0032	0.035	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS288	Q13	Maintenance	N/A	Maintenance	0.29	2.4	0.0046	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS360	Q3	Primary Haul Truck Operator	N/A	Primary Haul Truck Operator	0.17	2.11	0.0092	0.035	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS306	Q8	Excavator Operator (rock pick)	N/A	Excavator Operator (rock pick)	0.11	2.4	<0.0031	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS129	Q7	Quarry Supervisor	N/A	Quarry Supervisor	2.6	2.4	0.015	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS293	Q1	Driller	N/A	Driller	<0.10	2	<0.0032	0.033	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	6/03/2023	2023	RASS207	Q10	Quality Technician	N/A	Quality Technician	<0.10	2.4	<0.0042	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/11/2023	2023	ED231123.4	Q3	Primary Haul Truck Operator	N/A	Hauling rock between north east pit and	0.31	2.4	<0.0034	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/11/2023	2023	ED231123.4	Q21	Front End Loader Operator	N/A	Feed crusher	<0.10	2.1	<0.0035	0.033	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/11/2023	2023	ED231123.4	Q7	Quarry Supervisor	N/A	Water cart for 2 Supervisory work, in the office and mobile	<0.10	2.5	<0.0033	0.042	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/11/2023	2023	ED231123.4	Q5	Sales Loader Operator	N/A	Loading trucks and managing stockpile	<0.10	2.5	<0.0034	0.042	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/11/2023	2023	ED231123.4	Q16	Weighbridge Operator	N/A	Weighbridge all shift	0.11	2.4	<0.0034	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	23/11/2023	2023	ED231123.4	Q8	Excavator Operator	N/A	Rock hammer	<0.10	2.4	<0.0037	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	07/03/2024	2024	TN070324.4	Q16	Weighbridge Operator	N/A	In the weigh bridge office all day	0.14	2.64	0.005	0.044	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	07/03/2024	2024	TN070324.4	Q3	Primary Haul Truck Operator	N/A	Operating the Primary Haul Truck all day	<0.10	2.4	0.0043	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	07/03/2024	2024	TN070324.4	Q5	Sales Loader Operator	N/A	Operate Sales Loader all day	0.11	2.4	<0.0031	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	8/03/2024	2024	TN080324.4	Q21	Front End Loader Operator	Q12	Operating front end loader all day	0.1	2.4	0.011	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	8/03/2024	2024	TN080324.4	Q5	Sales Loader Operator	N/A	Operate Sales Loader all day	<0.10	2.4	<0.0032	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	8/03/2024	2024	TN080324.4	Q3	Primary Haul Truck Operator	N/A	Operating the Primary Haul Truck all day	<0.10	2.4	<0.00032	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	8/03/2024	2024	TN080324.4	Q13	Maintenance worker	Q21	Supervisor duties and working in main	<0.10	2.4	<0.0032	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	8/03/2024	2024	TN080324.4	Q15	Water Truck	N/A	Water cart all day	<0.10	2.4	<0.0032	0.04	Québec model
Aggregates	VIC	Colac Quarry	Hard Rock	8/03/2024	2024	TN080324.4	Q17	Excavator Operator (non rock pick)	N/A	Operating the excavator all day	<0.10	2.4	<0.0032	0.04	Québec model

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Blue Atmosphere

PM 10 MONITORING REPORT

May 2023 – April 2024

FOR

Holcim (Australia) Pty Ltd

Colac Quarry

Potters Road

Ondit, VIC 3249

Rev 1

Sunday, 2nd June 2024

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Monitoring location:

Holcim Colac Quarry, located on Potters Road, Ondit, VIC 3249.

Coordinates: Latitude: 38° 15' 27.10"
 Longitude: 143° 36' 43.72"

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Equipment: Thermo/R&P PM 10 TEOM (Tapered Element Oscillating Microbalance)

Wind sensor: RM Young 85000

Exceedance level: $50\mu\text{g}/\text{m}^3$ 24 hours average (NEPM)

The AQMS is located on an embankment on the Western side of the Quarry, South of the Office, and Quarry operations.

50m North of the station is the Quarry Gate and the access road is unpaved.

The station employs a PM10 monitor - Tapered Element Oscillating Microbalance manufactured by Thermo, with incorporated Ambient Temperature, Relative Humidity and Ambient Pressure, and a separate RM Young wind sensor.

The data is logged by an EviDAS Data Logger and data is downloaded every 15 minutes to a database managed by Envista ARM Software.

The station is maintained monthly, and the recorded data is checked daily.

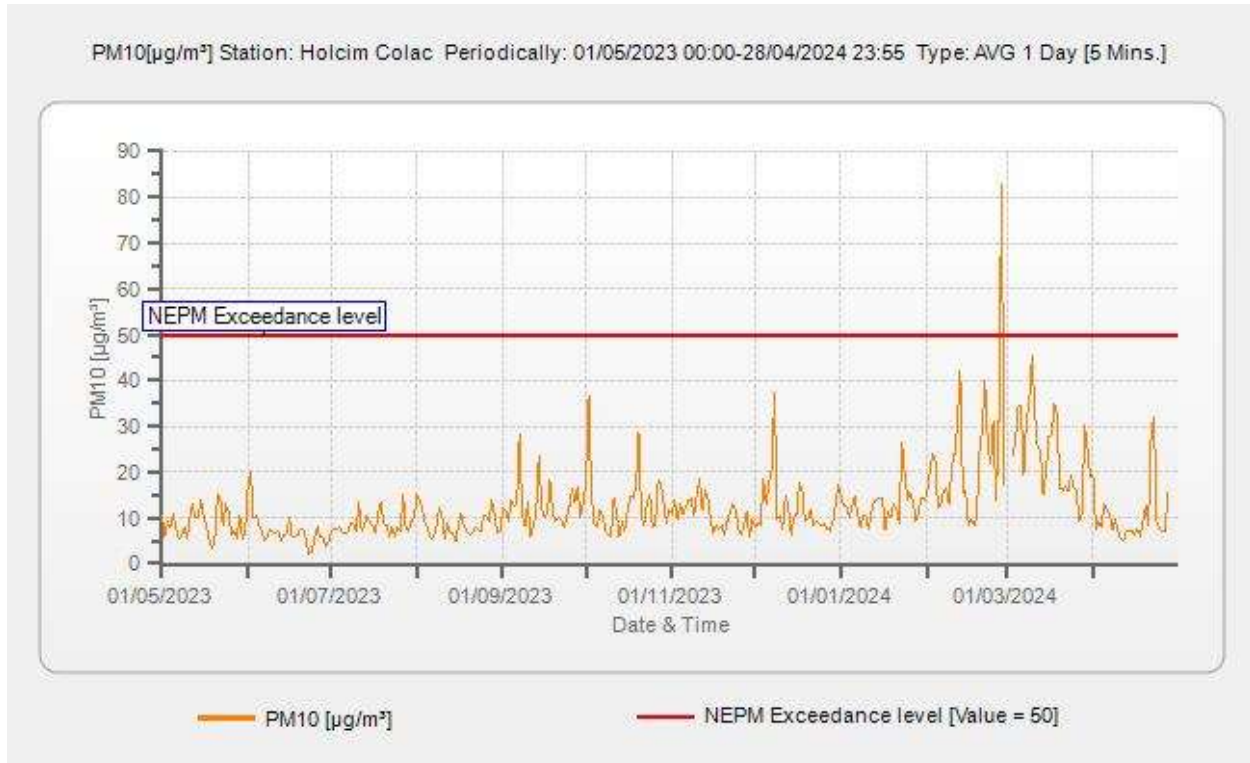
The Quarry has its own EnvistaARM Computer, in the office, where the quarry personnel can monitor the dust levels and take appropriate measures to mitigate the dust generation.

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12 months PM10 - 24 hours average:



Exceedances: One exceedance

PM10[$\mu\text{g}/\text{m}^3$] Station: Holcim Colac
Periodically: 01/05/2023 00:00-28/04/2024 23:55 Type: AVG 1 Day [5 Mins.]

Date & Time	PM10
	$\mu\text{g}/\text{m}^3$
28/02/2024 00:00	82.66
Minimum	82.66
MinDate	28/02/2024 00:00
Maximum	82.66
MaxDate	28/02/2024 00:00
Avg	82.66
Num	1
Data[%]	100
STD	0

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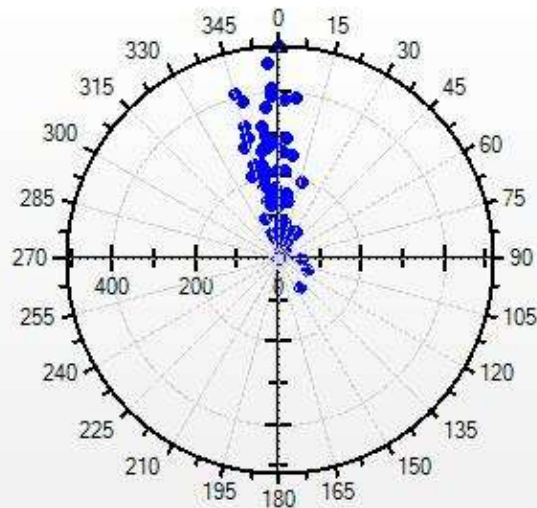
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Conditions at the exceedance time:

Station: Holcim Colac : 28/02/2024 Type: AVG 1 Hr. [5 Mins.]

Date & Time	PM10 µg/m³	Amb Temperature °C	Ambient RH %	WSV m/s	WDV Deg
28/02/2024 09:00	46.57	23.4	54.94	5.12	39.23
28/02/2024 10:00	120.76	25.43	46.57	13.12	355.9
28/02/2024 11:00	72.58	27.77	41.67	13.03	13.58
28/02/2024 12:00	222.06	30.1	33.25	15.9	1.26
28/02/2024 13:00	323.63	31.92	28.58	20.09	355.31
28/02/2024 14:00	267.68	34.13	25.81	27.94	347.49
28/02/2024 15:00	175.69	35	23.1	28.62	345.49
28/02/2024 16:00	94.26	35.58	25.73	21.12	336.88
28/02/2024 17:00	89.84	29.22	41.88	15.78	260.81

Wind: Holcim Colac Periodically: 28/02/2024 09:00-28/02/2024 15:00 Type: Scatter Direction: Blowing From
Holcim Colac PM10[µg/m³] Calm: 0.00%



The conditions at the exceedance time were hot, dry day with strong Northerly winds.

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PM10[$\mu\text{g}/\text{m}^3$] Histogram: Holcim Colac Periodically: 01/05/2023
00:00-30/04/2024 23:55 1 Day

Classes	PM10
<=10	46.99%
10 - 20	41.80%
20 - 30	6.01%
30 - 40	4.10%
40 - 50	0.55%
>50	0.27%

Yearly average values for 1h averages and 24h averages are:

PM10[$\mu\text{g}/\text{m}^3$] Station: Holcim Colac
Periodically: 01/05/2023 00:00-28/04/2024
23:55 Type: AVG 5 Mins. [5 Mins.]

Minimum	-44.43
MinDate	18/11/2023 23:40
Maximum	562.57
MaxDate	08/12/2023 09:55
Avg	12.57
Num	104223
Data[%]	99.42
STD	13.8

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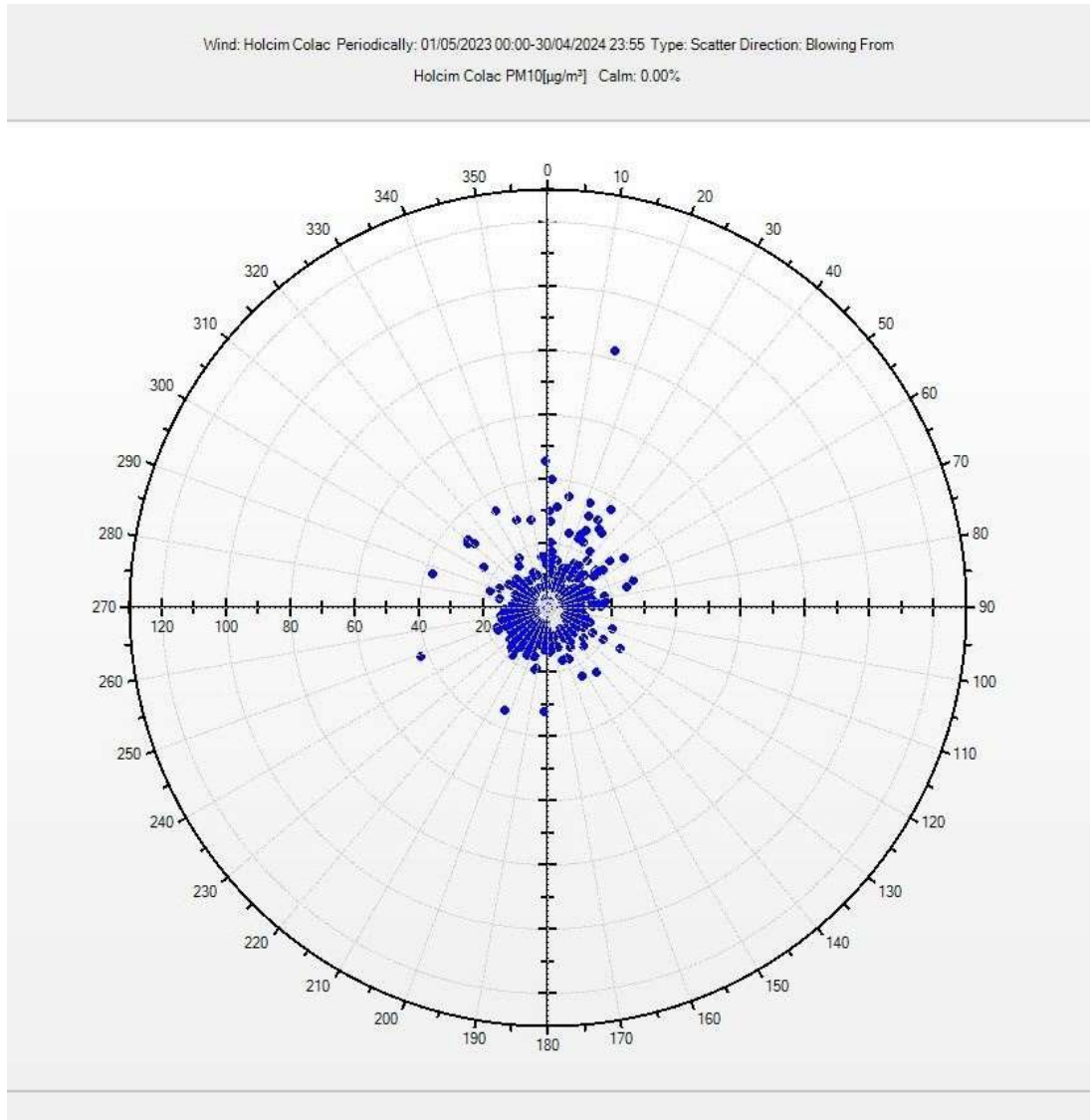
PM10[$\mu\text{g}/\text{m}^3$] Station: Holcim Colac
Periodically: 01/05/2023 00:00-28/04/2024
23:55 Type: AVG 1 Day [5 Mins.]

Minimum	2.22
MinDate	23/06/2023 00:00
Maximum	82.66
MaxDate	28/02/2024 00:00
Avg	12.54
Num	362
Data[%]	99.45
STD	8

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Scatter diagram of the 24 hours averages:

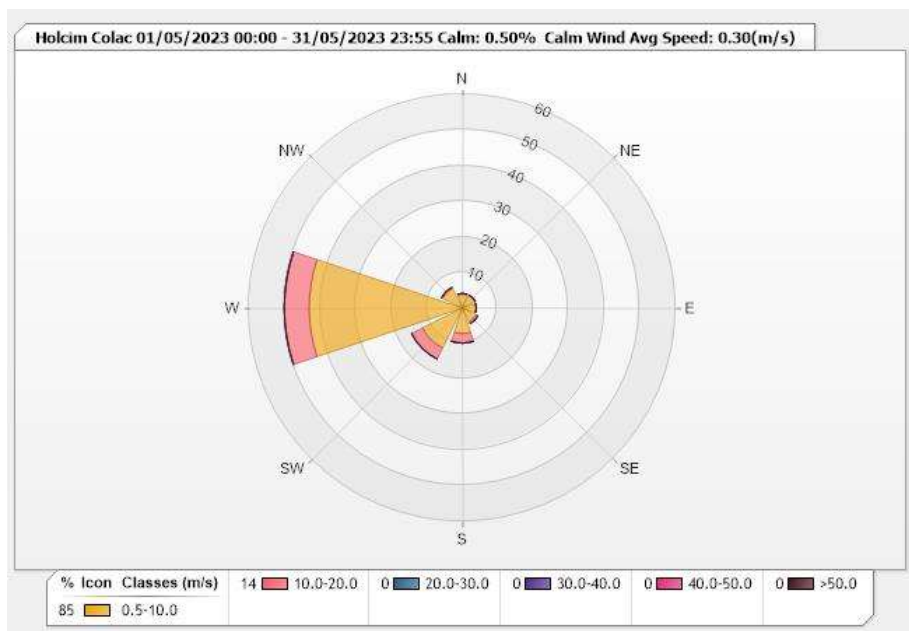


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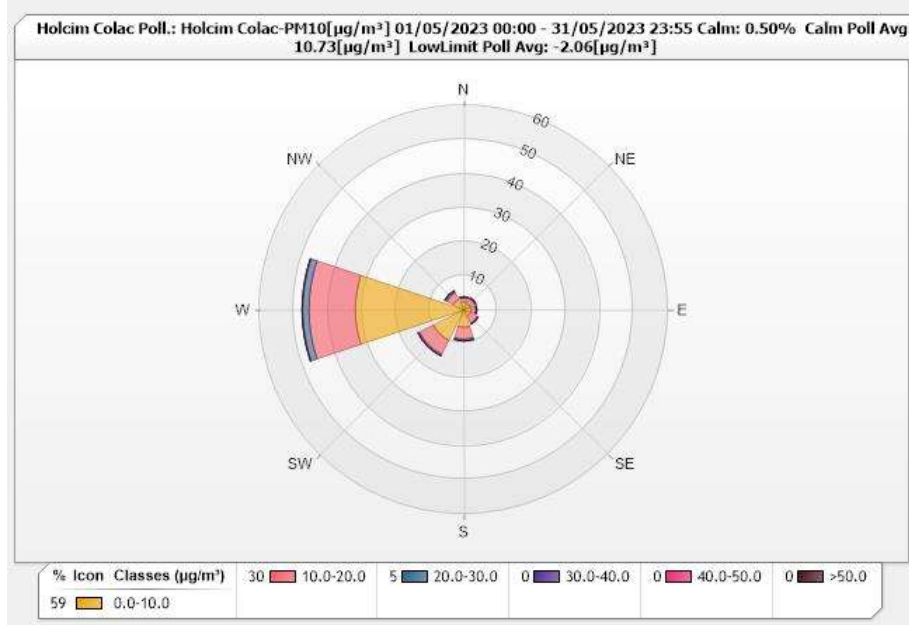
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Wind rose – May 2023



Pollution rose – May 2023

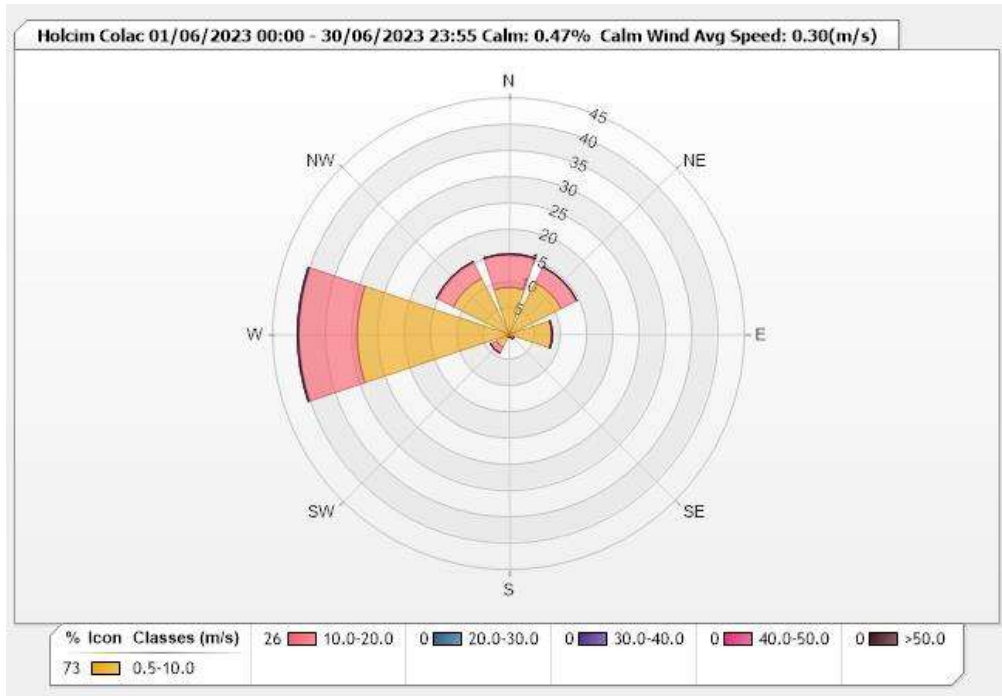


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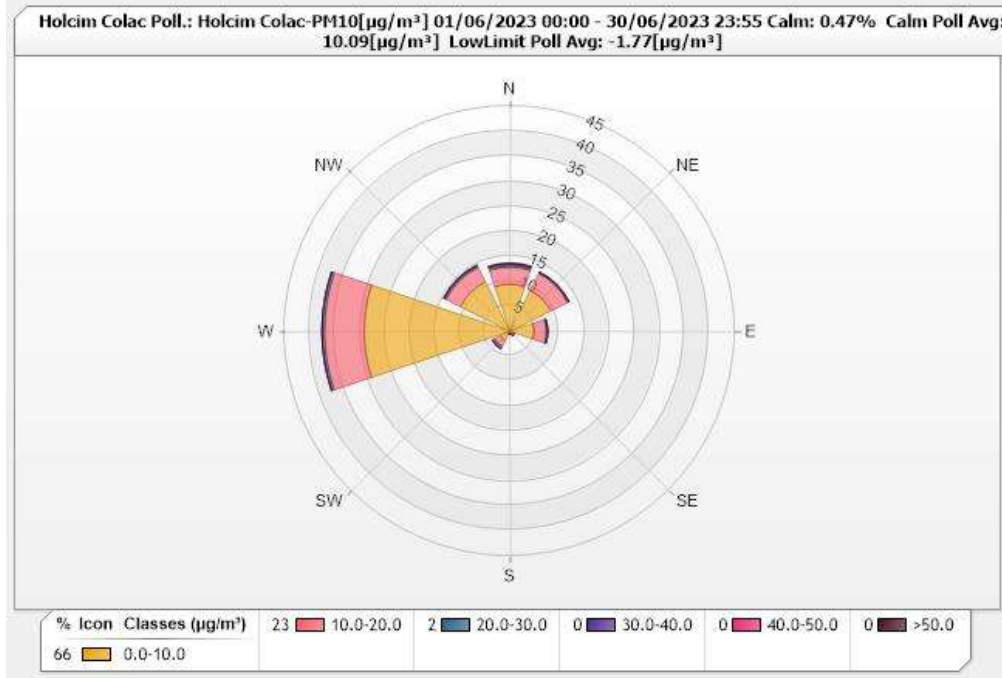
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Wind rose – June 2023



Pollution rose – June 2023

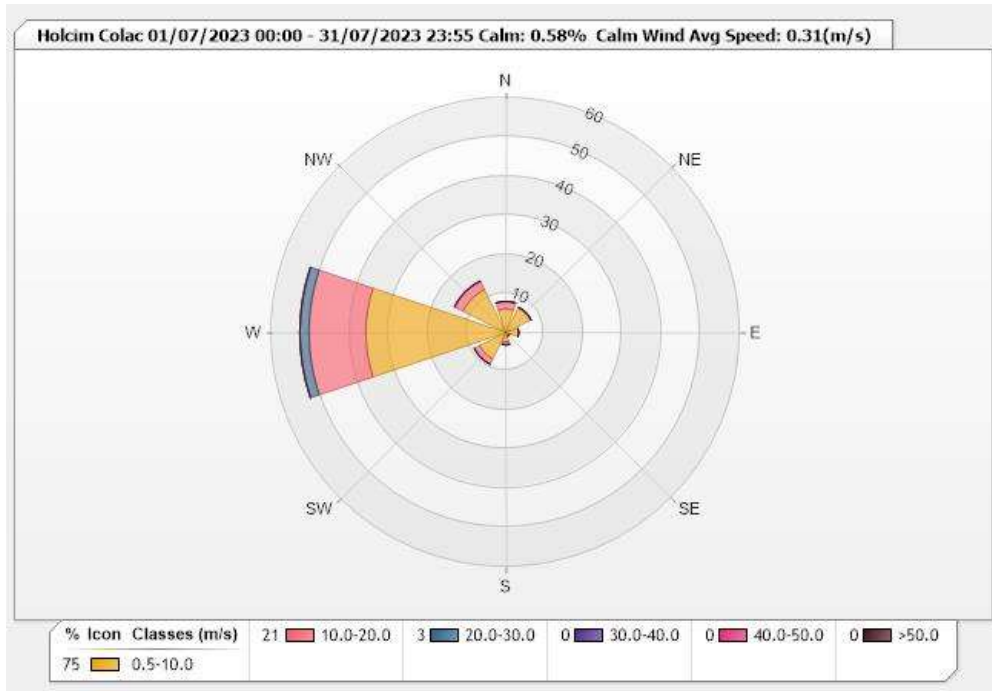


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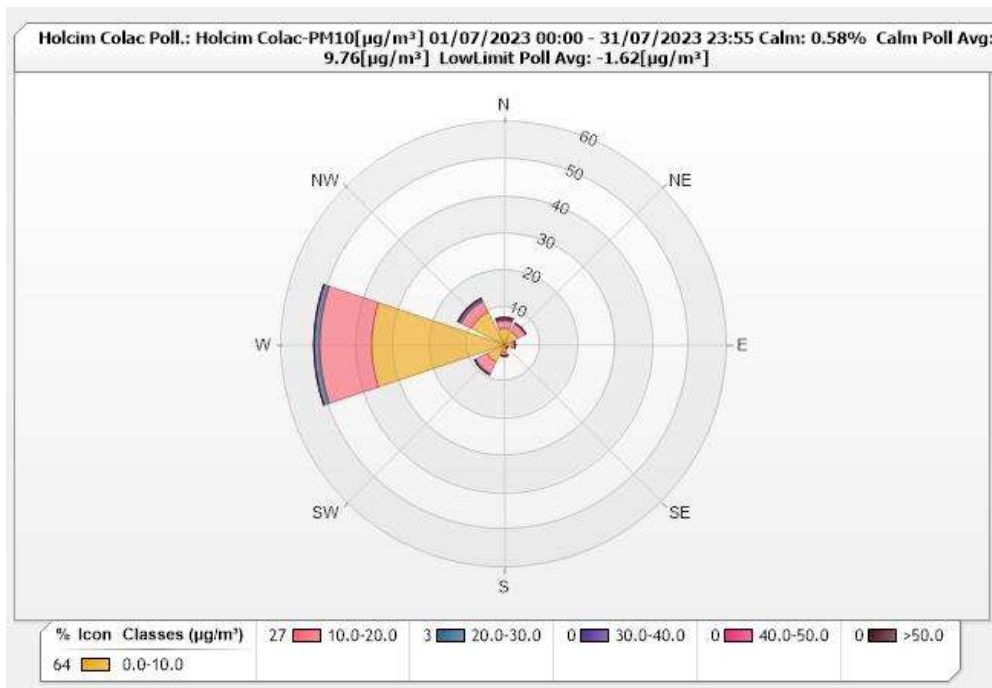
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Wind rose – July 2023



Pollution rose – July 2023

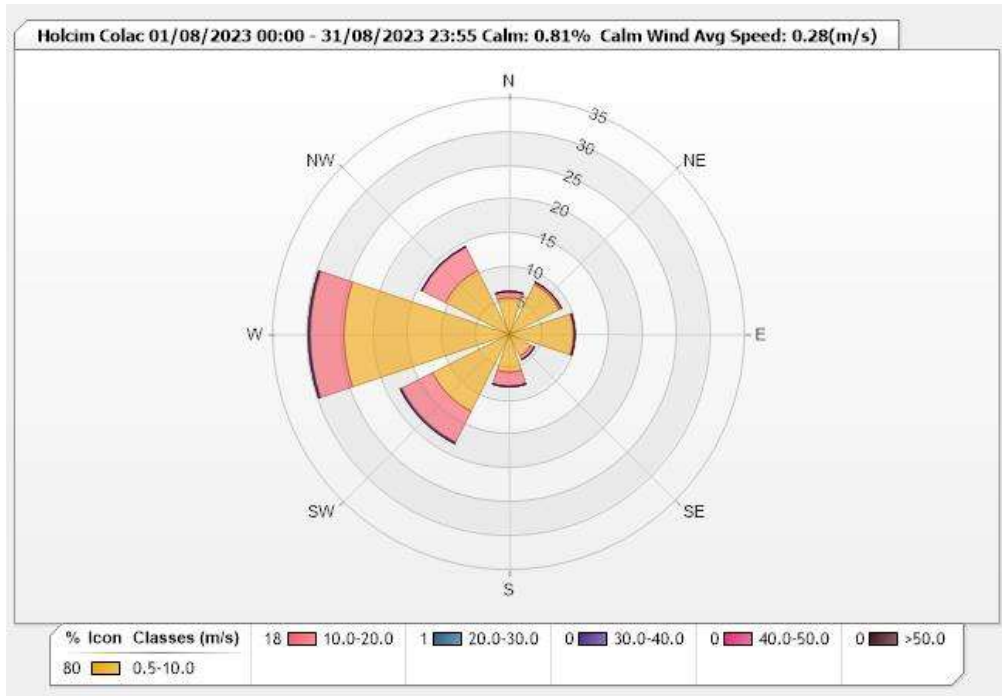


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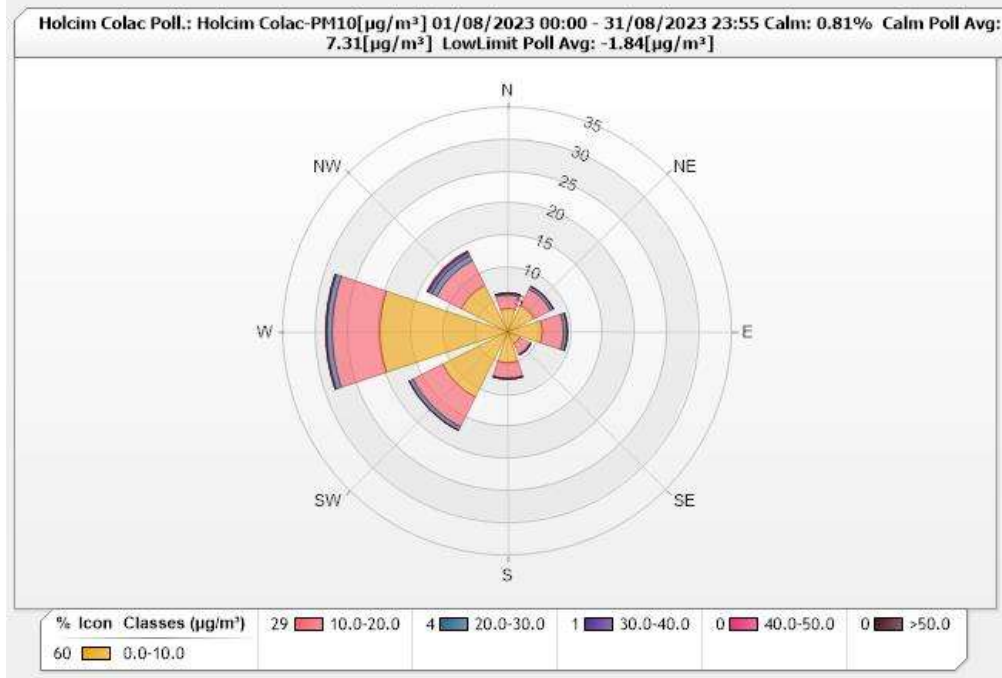
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Wind rose – August 2023



Pollution rose – August 2023

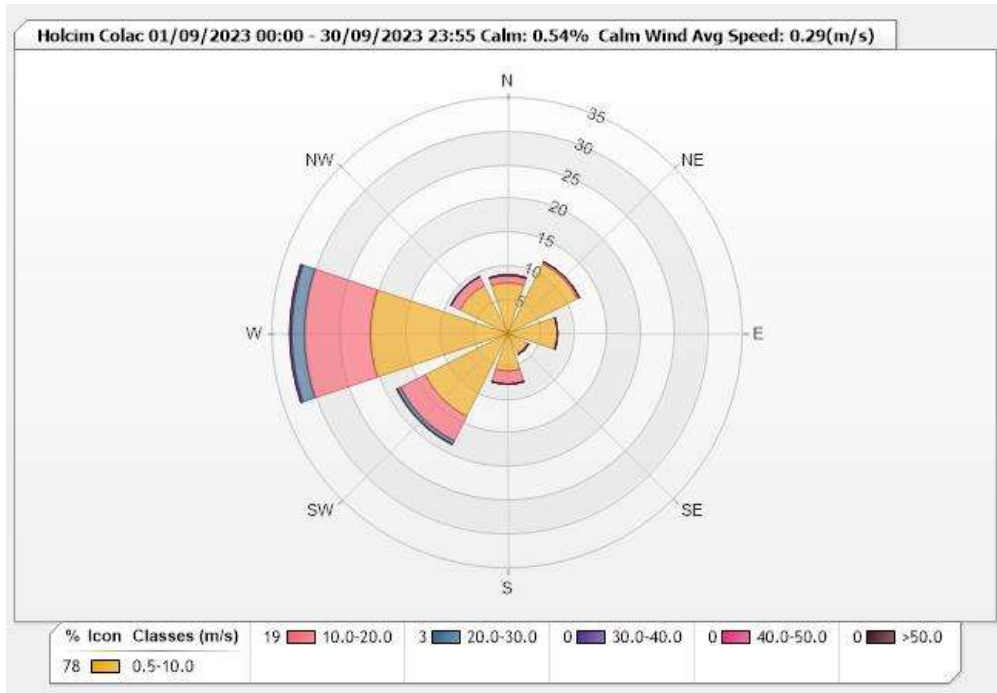


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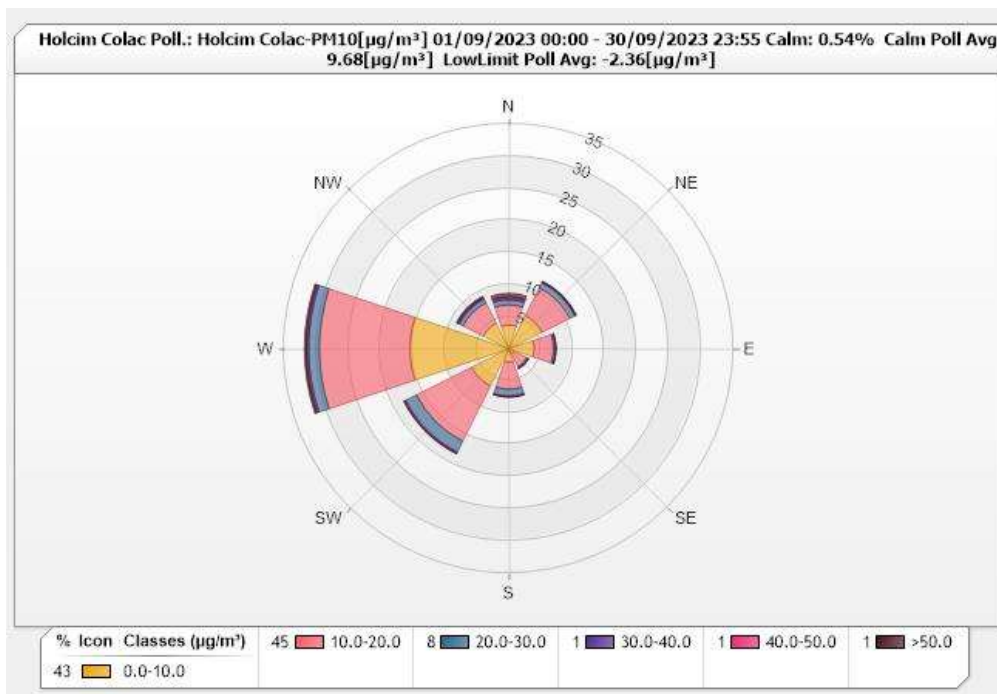
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Wind rose – September 2023



Pollution rose – September 2023

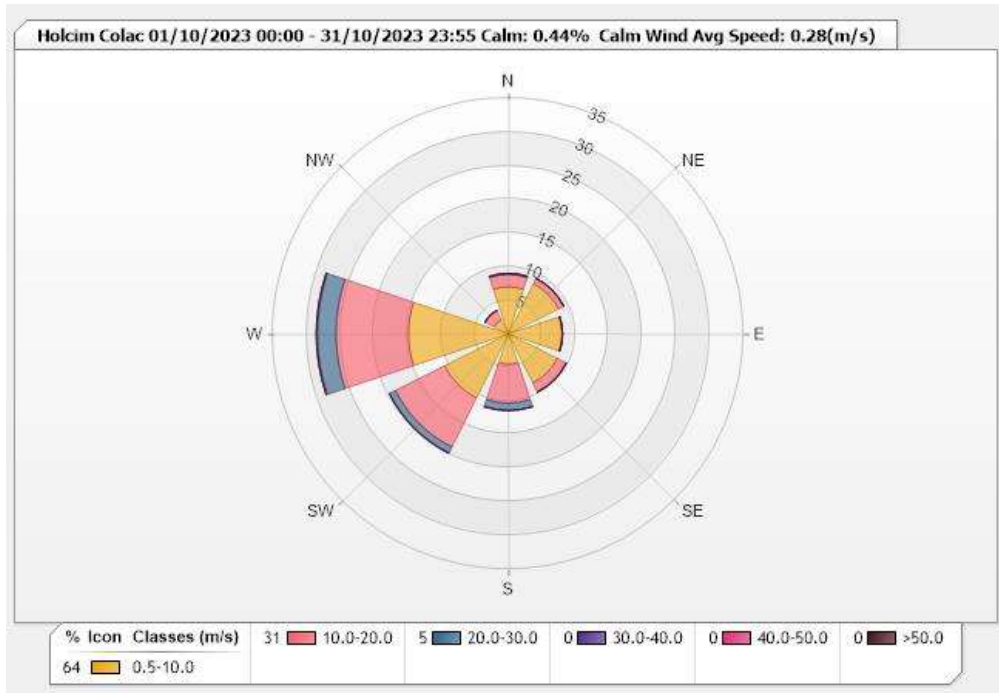


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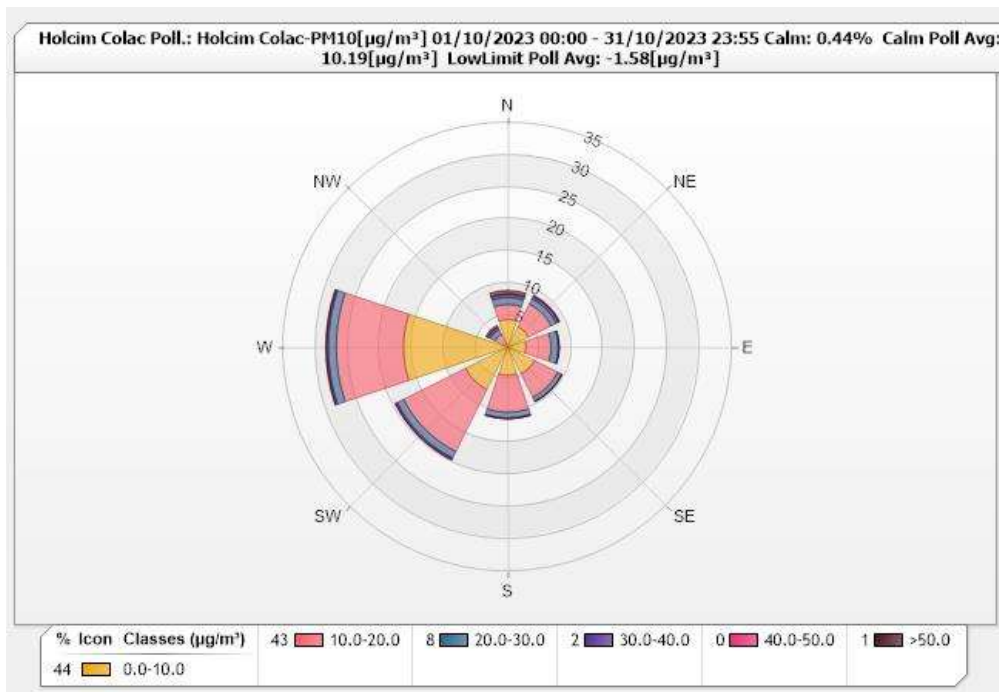
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Wind rose – October 2023



Pollution rose – October 2023

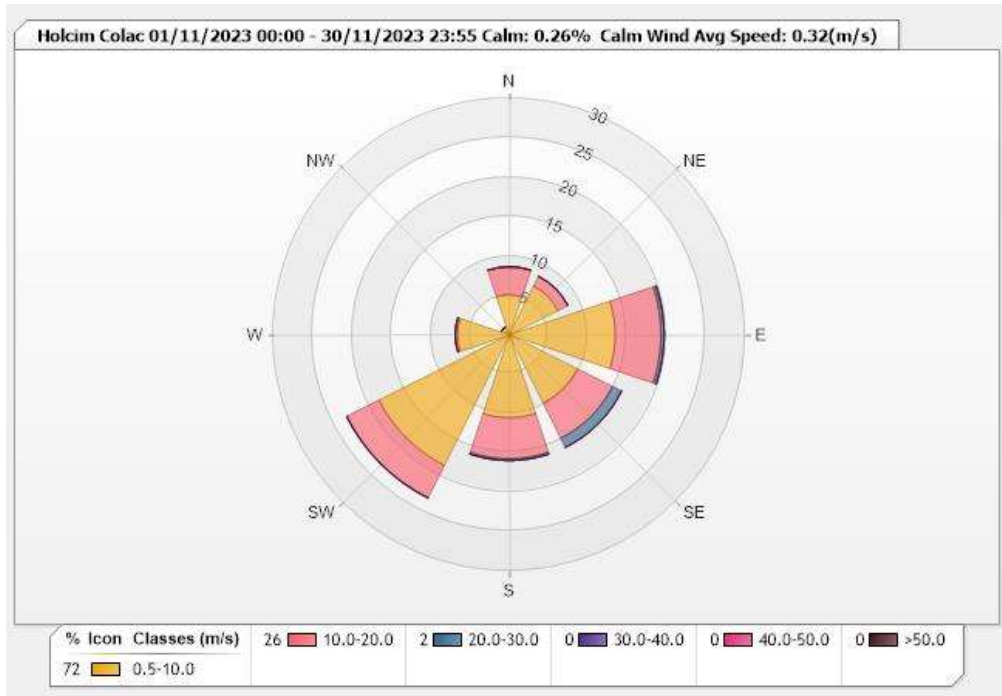


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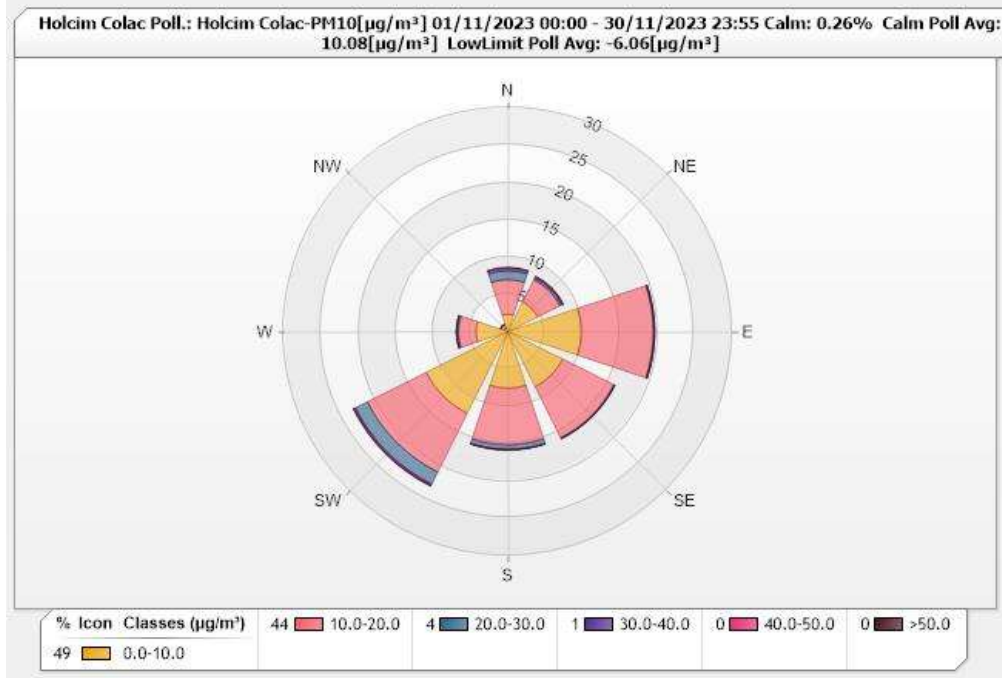
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Wind rose – November 2023



Pollution rose – November 2023

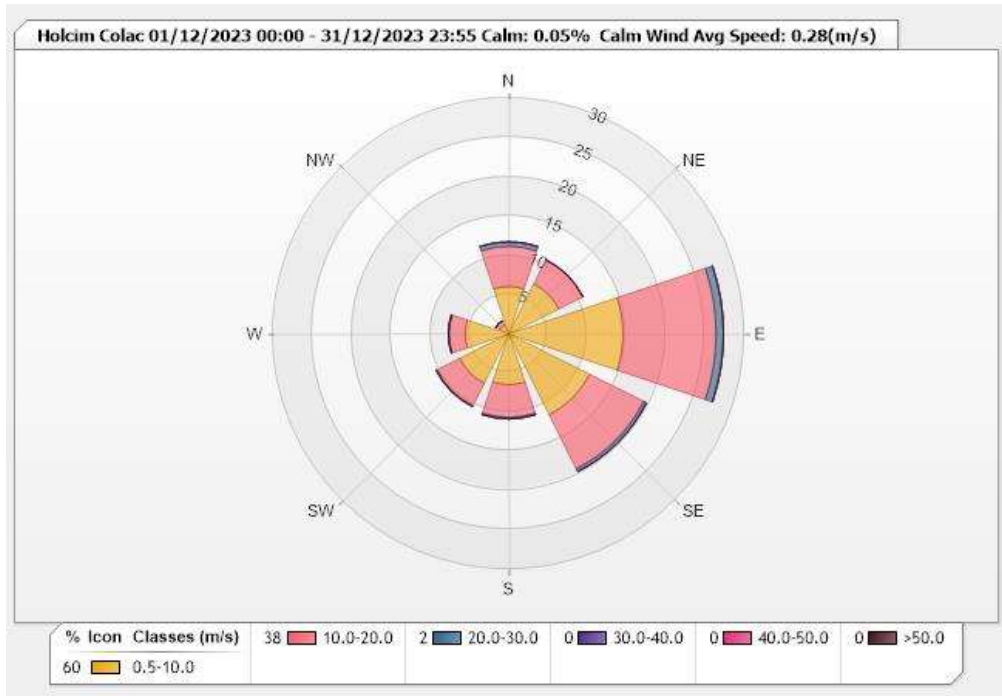


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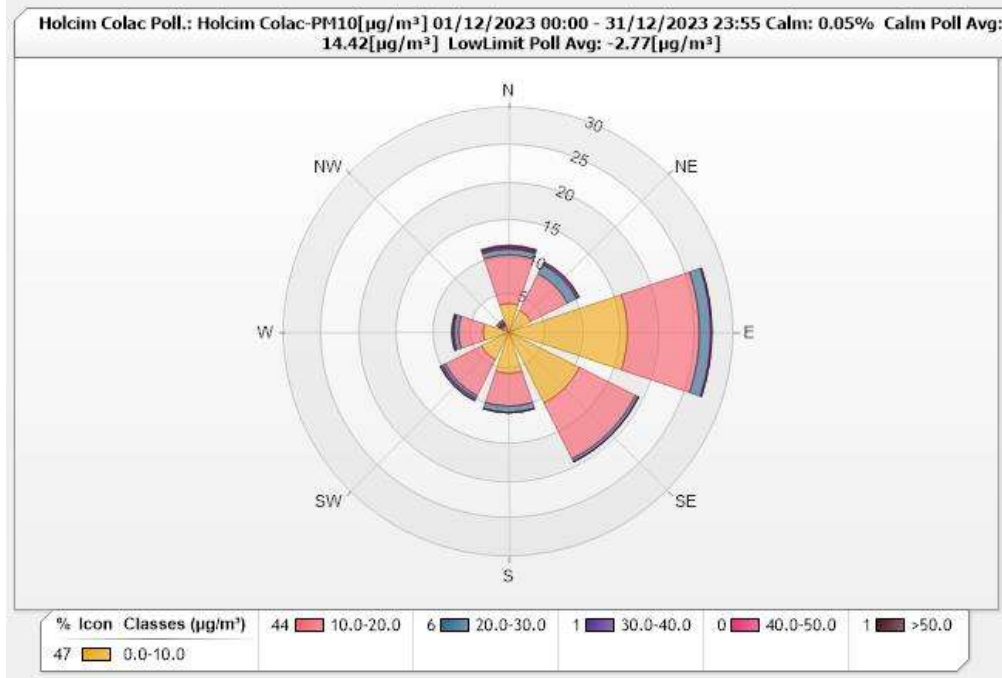
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Wind rose – December 2023



Pollution rose – December 2023

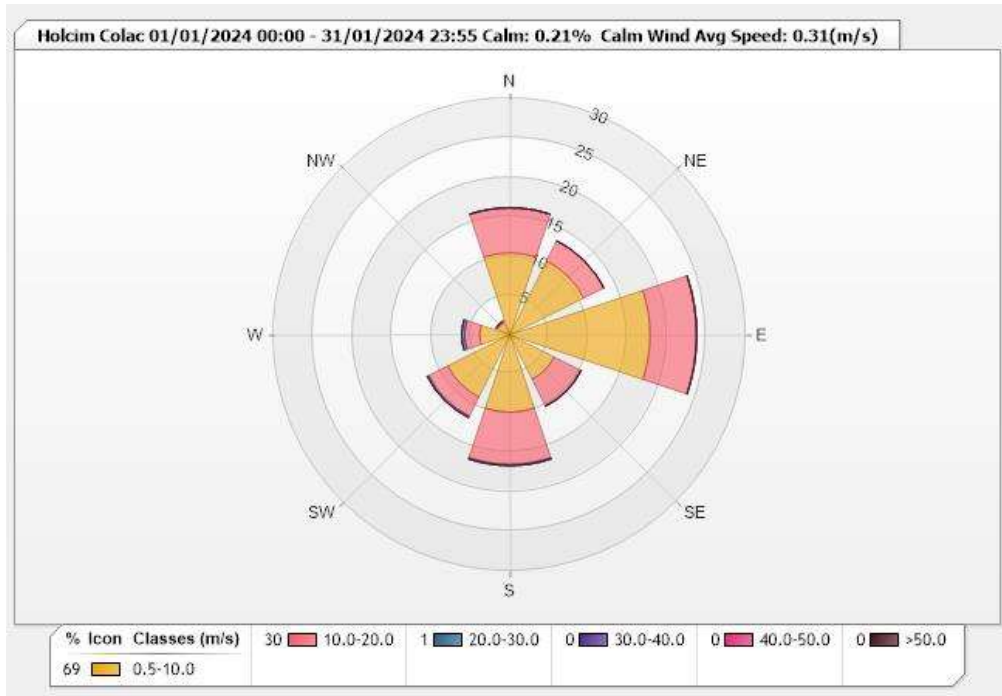


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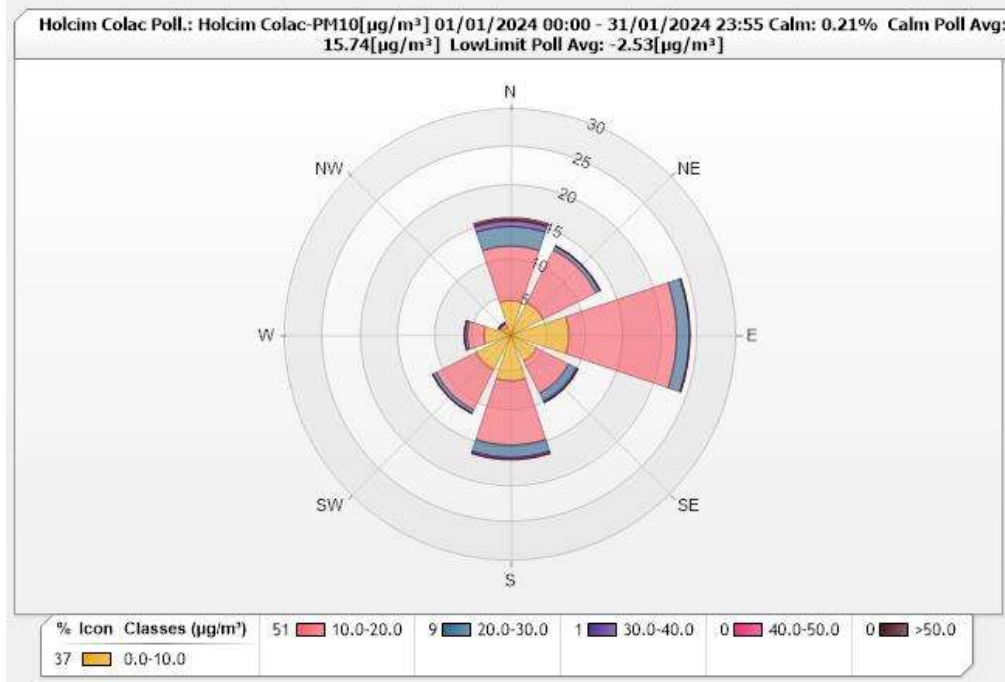
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Wind rose – January 2024



Pollution rose – January 2024

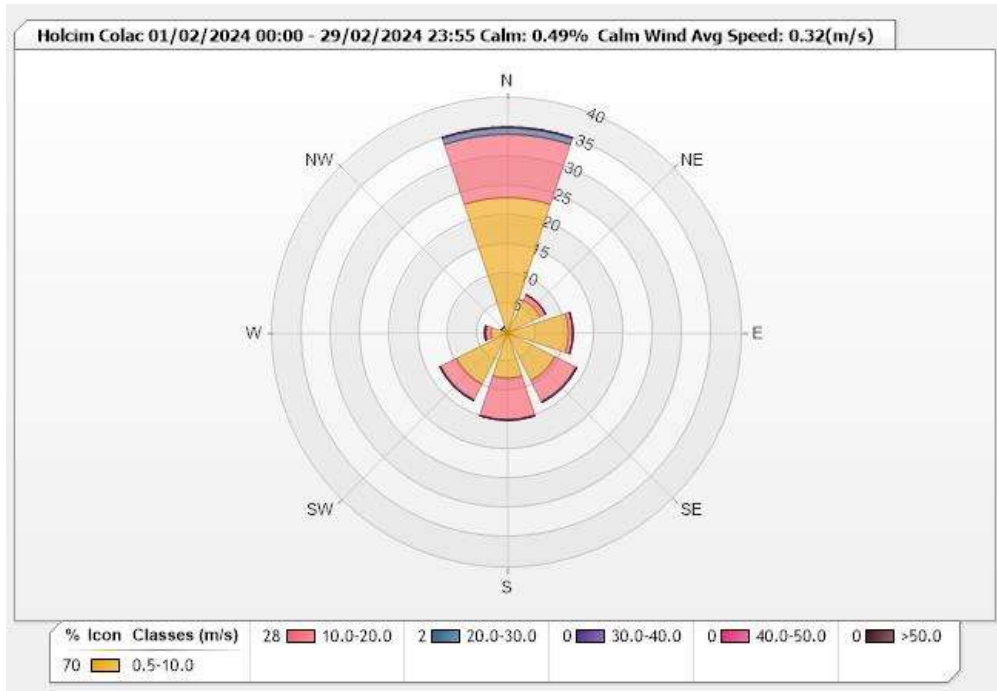


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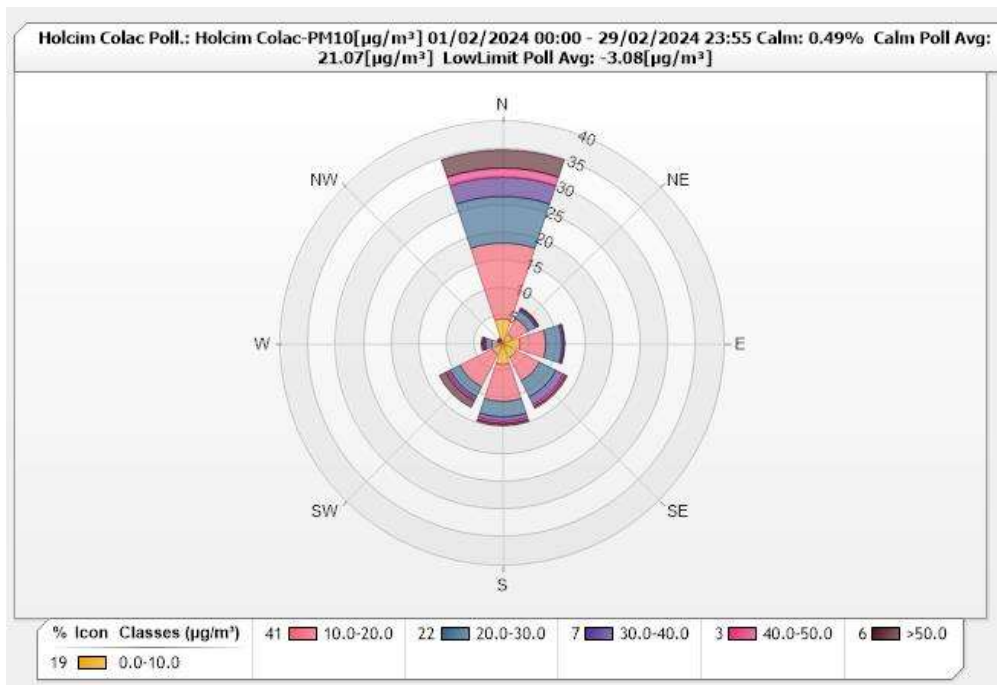
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Wind rose –February 2024



Pollution rose – February 2024

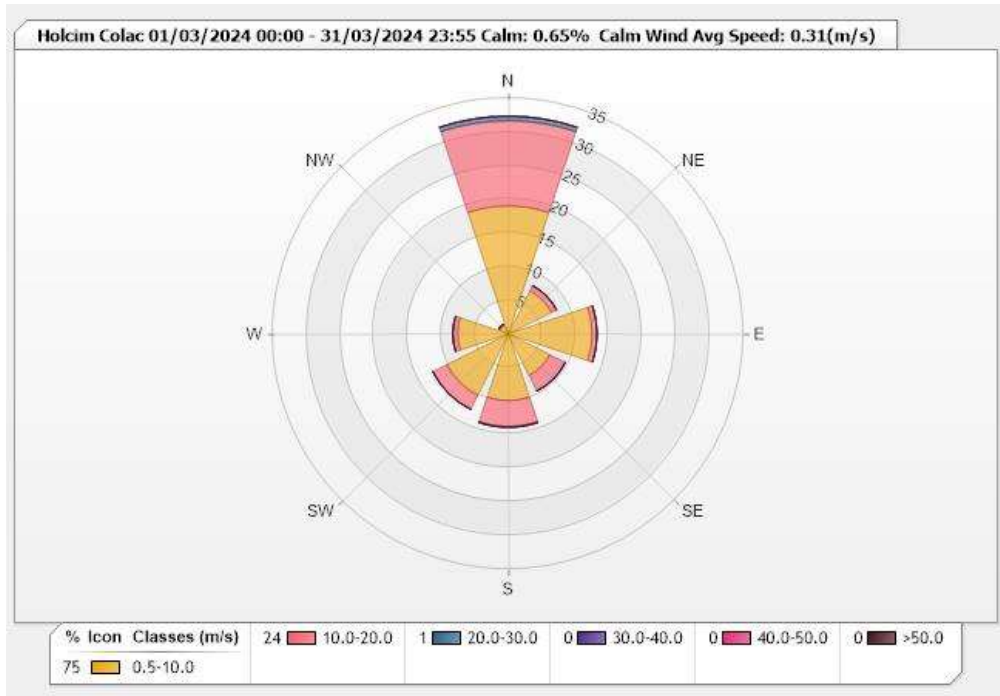


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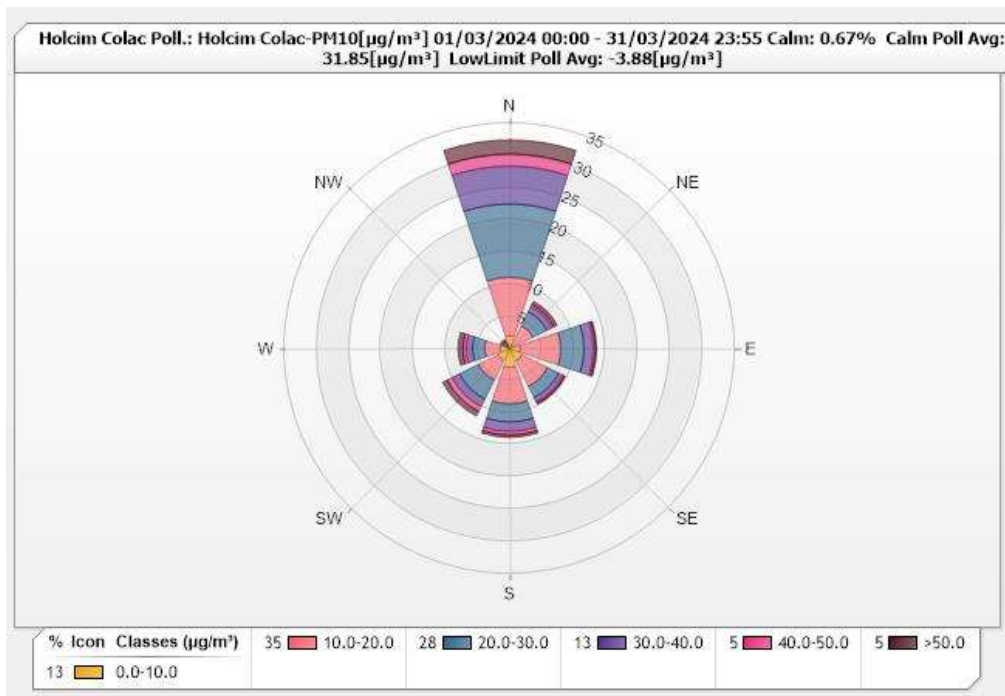
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Wind rose – March 2024



Pollution rose – March 2024

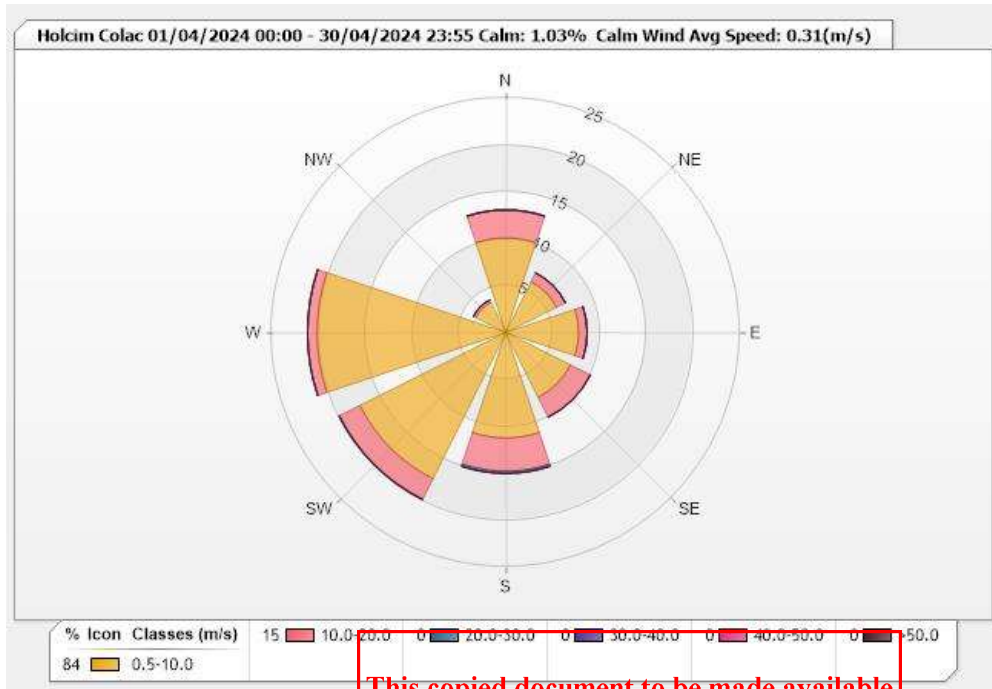


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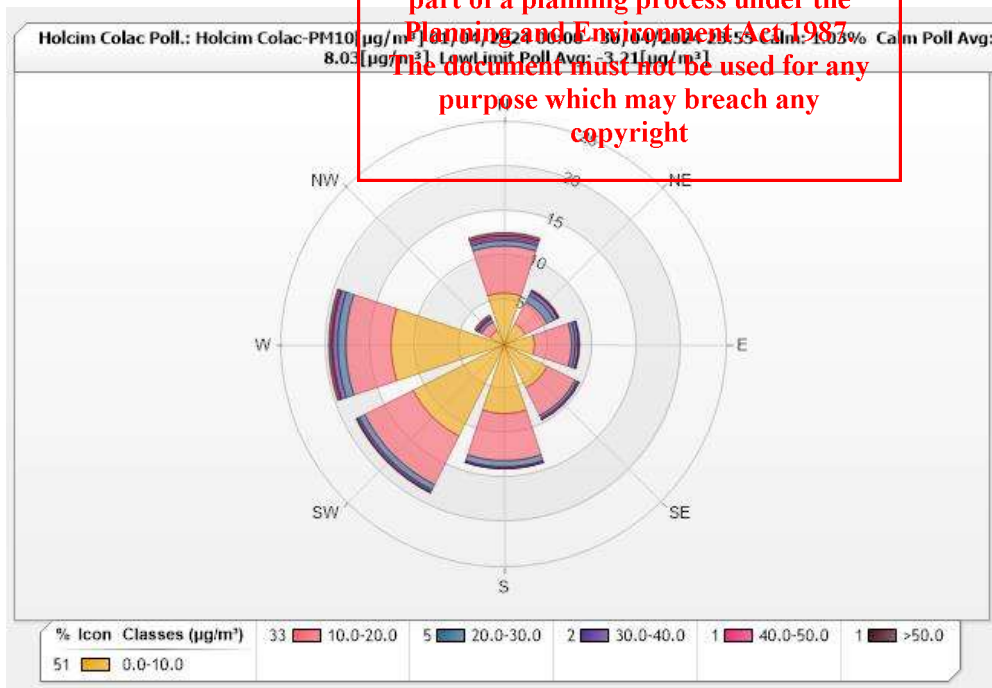
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Wind rose – April 2024



Pollution rose – April 2024

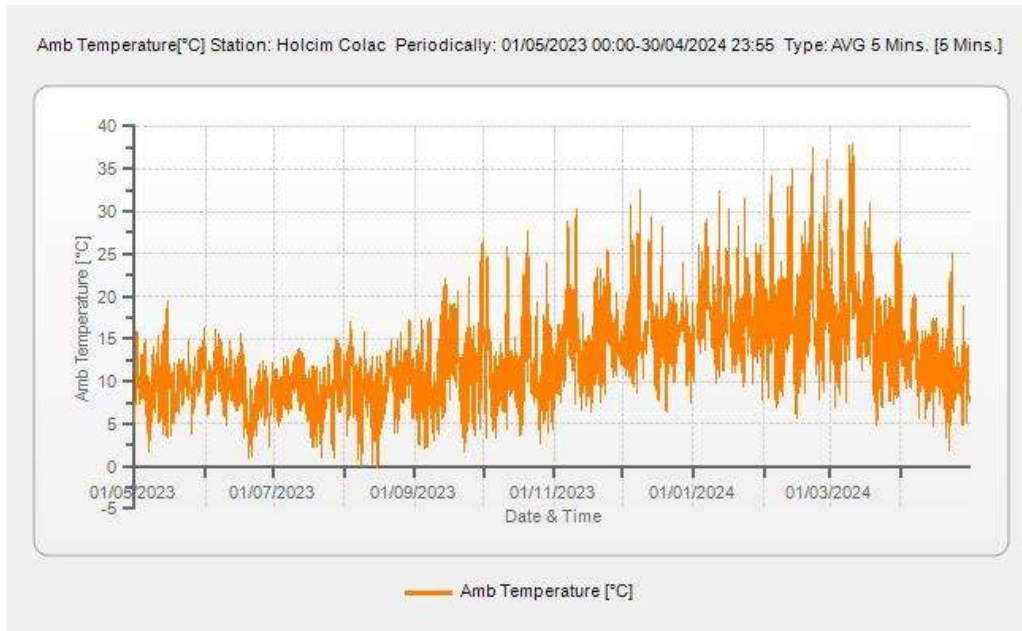


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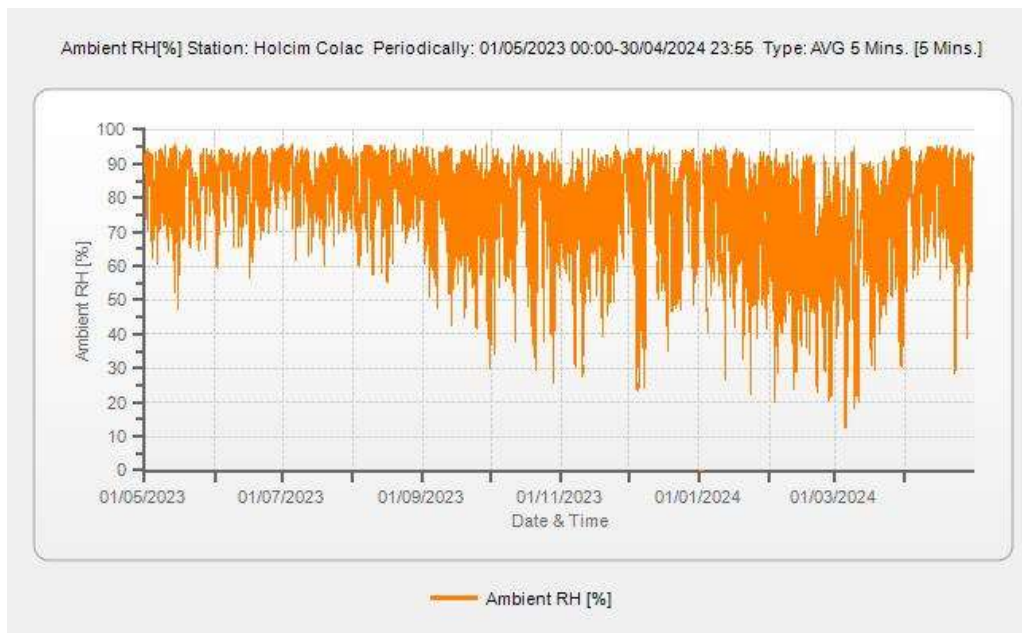
Obs: all Wind Rose and Pollution Rose charts have been generated using “blowing From” convention for the wind. All pollution Rose have same classes: 10, 20, 30, 40 and 50 for particulate concentration.

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Ambient Temperature Graph – from 5 min data



Relative Humidity Graph – from 5 min data



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Missing Data Report

Missing Data: Colac 12M: 05/2023 to 04/2024 - 5 Mins.

Site	Parameter	Start Date	End Date	Missing Data[%]
Colac	PM10	01 May, 2023 12:00 AM	31 April 2024 11:55 PM	0.58
Colac	AT	01 May, 2023 12:00 AM	31 April 2024 11:55 PM	0.33
Colac	RH	01 May, 2023 12:00 AM	31 April 2024 11:55 PM	0.33
Colac	WS	01 May, 2023 12:00 AM	31 April 2024 11:55 PM	0.29
Colac	WD	01 May, 2023 12:00 AM	31 April 2024 11:55 PM	0.29
Colac	Sigma	01 May, 2023 12:00 AM	31 April 2024 11:55 PM	0.29

Silviu Greenhill



Principal Scientist

Director

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