

AIR MONITORING RISK ASSESSMENT
CRINGILA PUBLIC SCHOOL
35 SHEFFIELD STREET
CRINGILA NSW 2502

Weekly Report
05-12-2018

NSW Department
of Education

Cringila Public School

35 Sheffield Street
Cringila NSW 2502

December 2018
C107826: J153825: RC/TO

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1	Electronic	NSW Department of Education	Greg Mott Senior Group Leader – School Infrastructure NSW

Air Monitoring Risk Assessment - IAQ

Cringila Public School, 35 Sheffield Street, Cringila NSW 2502

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1. INTRODUCTION

At the request of the Department of Education, Greencap were engaged to undertake indoor air monitoring utilising real-time monitoring devices at Cringila Public School, 35 Sheffield Street Cringila NSW 2502. The aim of this monitoring program was primarily to investigate concerns raised by school employees and the Department of Education regarding the potential exposure to elevated concentrations of air pollutants, specifically carbon dioxide (CO₂), during the normal occupation of rooms within the school.

2. OBJECTIVES

Based on the correspondence provided by the NSW Department of Education, the objective of this assessment is to undertake an assessment of the indoor air quality to determine the concentration of CO₂ within school buildings at Cringila Public School.

This report presents the results relating to the weekly indoor air quality monitoring investigation carried out within the school hall (specifically, the stage area - 6R0003) in Building B006 at Cringila Public School. The location of the monitoring is displayed in **Appendix A: Site Map and Sample Locations**.

3. ASSESSMENT CRITERIA

Carbon Dioxide (CO₂) measurements are compared against the ASHRAE Standard 62-2010 *Ventilation for Acceptable Indoor Air Quality* (American Society of Heating, Refrigeration and Air-Conditioning Engineers).

CO₂ measurements provide an indication of the adequacy of fresh air levels supplied to rooms within a building. A person's comfort and health may be affected by high concentrations of CO₂.

For the purpose of this assessment, the recorded CO₂ measurements will be referenced against the ASHRAE Guideline value of 1,000 parts per million (ppm). This criteria is set for human comfort factors and is deemed to be the most conservative level to adopt.

3.1 CARBON DIOXIDE (CO₂)

CO₂ is a normal constituent of exhaled breath and is commonly measured as a screening tool to evaluate whether adequate volumes of fresh outdoor air are being introduced into indoor air.

The outdoor level of CO₂ usually ranges from 300 ppm to 400 ppm. The CO₂ level is usually greater inside a building than outside, even in buildings with few complaints about indoor air quality. If indoor carbon dioxide levels are more than 1,000 ppm, there is probably inadequate ventilation; and complaints such as headaches, fatigue, and eye and throat irritation may be prevalent.

4. INDOOR AIR QUALITY MONITORING METHODOLOGY

4.1 INDOOR AIR QUALITY MONITORING

Indoor air quality monitoring was conducted at a single location over the course of a school day to study the concentration of CO₂ within school buildings while they are occupied. Weekly monitoring was conducted within the school hall (6R0003), Building B006 at Cringila Public School.

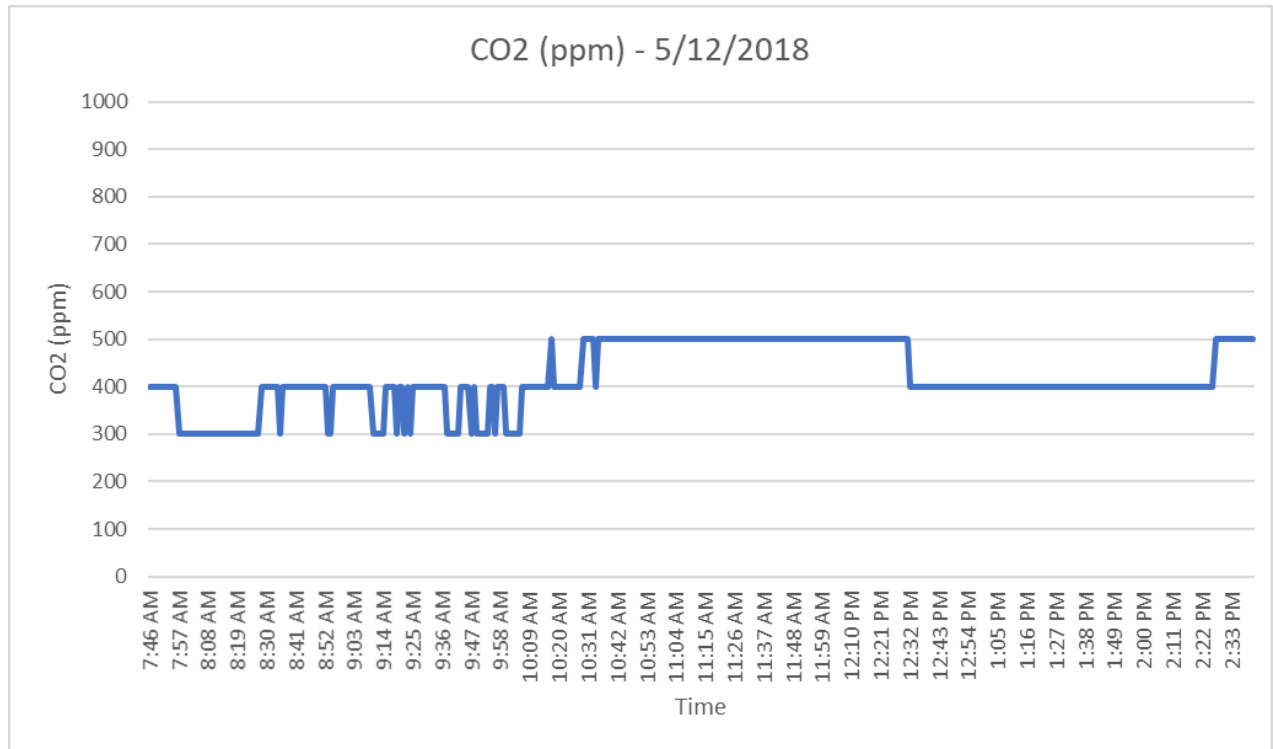
In this assessment, RAE Systems Multi RAE Gas Detectors were used with a specific sensor configuration to target CO₂ concentrations to be assessed against the adopted ASHRAE Guideline of 1,000 ppm as detailed above.

4.2 DATA ANALYSIS AND REPORTING

The units are configured to log data at one-minute intervals and run throughout the course of the school day. Logged data was downloaded from the device and tabulated to present the results. Refer to **Section 5: Indoor Air Quality Monitoring Results**.

5. INDOOR AIR QUALITY MONITORING RESULTS

The CO₂ concentration results for the monitoring conducted on 05/12/2018 are summarised below in Figure 1. Monitoring locations are displayed in **Appendix A: Site Map and Sampling Locations**.



6. DISCUSSION

Generally, the monitoring results for CO₂ within the school hall at Cringila Public School were between 300 ppm and 500 ppm during the monitoring. All results were below the ASHRAE guideline level of 1,000 ppm.

It should be noted that the adopted ASHRAE Guideline of 1,000 ppm is set for comfort only. A time weighted average (TWA) of 5,000 ppm has been set by Safe Work Australia for health purposes.

It should be noted that short term static monitoring results cannot be compared to exposure monitoring criteria and therefore may be used as guidance only with regard to concentrations of CO₂ in the school hall.

Adequate supply of fresh air is required to dilute CO₂ and other pollutants to acceptable levels for human comfort and health considerations.

This concludes the weekly indoor air quality monitoring report for monitoring conducted on the 5th December 2018. It is recommended that interim assessments are continued in order to gain firm and reliable data sets regarding the concentration of CO₂ within indoor environments at the school whilst further investigation of the site is undertaken.

Air Monitoring Risk Assessment

Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502

Appendix A: Site Map and Sampling Locations



Legend:

- ✕ Air monitor location
- North West Hotspot Investigation Area

Site	Cringila Public School
Area	School hall (Building B006)
Consultant	Rowan Clark/Tom Oyston
Date	Wednesday, 5 December 2018
Job Number	J153825
Report	AMR-IAQ-09
Version	1.0

Air Monitoring Risk Assessment

Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502

Appendix B: Calibration Certificates

Company: Active Environmental Solutions Hire
Contact: Aleks Todorovic
Address: 2 Merchant Avenue
 Thomastown Vic 3074
Phone: 03 9464 2300 | **Fax:** 03 9464 3421
Email: Hire@aesolutions.com.au

Manufacturer: RAE Systems
Instrument: MultiRAE Lite
Model: PGM 6208
Configuration: PID, OFCH
Wireless: -
Network ID: -
Unit ID: -

Serial #: MAA30042QB
Asset #: -
Part #: -
Sold: -
Last Cal: -
Job #: -
Cal Spec: Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>300 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	1.40
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen	O2	✓	
LEL	LEL	✓	
PID	10.6eV	✓	
Toxic 1	CO	✓	
Toxic 2	H2S	✓	
Toxic 3			
Toxic 4			
Toxic 5			

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen	O2	03420555UC	Fresh Air	20.9%	WO163704-3		20.9%	
			Oxygen	18.0%				18.0%
LEL	LEL	03110703T9	Methane	2.5% (50% LEL)	WO163704-3		0	50%
PID	10.6eV	03A30381QB	Isobutylene	100ppm	689134		0	100ppm
Toxic 1	CO	03060033N5	Carbon Monoxide	50ppm	WO163704-3		0	50ppm
Toxic 2	H2S	03AR0216Q3	Hydrogen Sulfide	10ppm	WO163704-3		0	10ppm
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: William Pak

Date: 12.07.2018

Next due: 12.01.2019

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 2 Merchant Avenue
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NSW Office – Ashfield
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 Unit 17, 23 Ashtan Place
 Banyo QLD 4014 Australia
 T: +61 7 3267 1433

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Company: Active Environmental Solutions Hire
Contact: Aleks Todorovic
Address: 2 Merchant Avenue
 Thomastown Vic 3074
Phone: 03 9464 2300 | **Fax:** 03 9464 3421
Email: Hire@aesolutions.com.au

Manufacturer: RAE Systems
Instrument: MultiRAE Lite
Model: PGM 6208
Configuration: NO, NO2, SO2, CO2
Wireless: -
Network ID: -
Unit ID: -

Serial #: M01C005735
Asset #: -
Part #: -
Sold: -
Last Cal: -
Job #: -
Cal Spec: Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>300 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	1.40
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen			
LEL			
PID			
Toxic 1	NO	✓	
Toxic 2	NO2	✓	
Toxic 3	SO2	✓	
Toxic 4	CO2	✓	
Toxic 5			

Engineer's Report
Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID								
Toxic 1	NO	03740026U9	Nitric Oxide	25ppm	WO153855-2		0	25ppm
Toxic 2	NO2	03750052RC	Nitrogen Dioxide	5ppm	WO169855-1		0	5ppm
Toxic 3	SO2	03AF0109T5	Sulfur Dioxide	5ppm	WO155612-5		0	5ppm
Toxic 4	CO2	03610036QC	Carbon Monoxide	5000ppm	WO169824-1		0	5000ppm
Toxic 5								

Calibrated/Repaired by: William Pak
 Date: 12.07.2018
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