



Adelaide Brighton Cement Ltd

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adelaidebrighton.com.au

Adelaide Brighton Cement Ltd
ABN 96 007 870 199
PO Box 77
Port Adelaide SA 5015
+61 8 8300 0300

Ground Level Particulate Monitoring and Reporting Plan

Adelaide Brighton Cement Limited

Licence number: 1126

**Premises Address: Victoria & Elder Roads,
Peterhead
(Birkenhead Site)**

ENVIRONMENT PROTECTION AUTHORITY

THIS IS THE APPROVED Ground Level Particulate Monitoring and Reporting Plan

REFERRED TO IN CONDITION U-1555

OF EPA AUTHORISATION NUMBER 1126

October 2023

DELEGATE *K Williams* DATE 16/10/2023
A/Principal Adviser

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Glossary

Term	Definition
$\mu\text{g}/\text{m}^3$	micrograms per cubic metre
μm	micrometre
$^{\circ}\text{C}$	degrees Celsius
m	metre
m^3	cubic metres
m^3/s	cubic metres per second
Nomenclature	Definition
Facility	Premises of Licence 1126
PM10	Particulate matter with a diameter less than 10 micrometres
PM2.5	Particulate matter with a diameter less than 2.5 micrometres
24 hour period	Calendar day
24 hour real time	Previous 24 hour data available at start of next 24 hour period
TSP	Total Suspended Particulates
Abbreviations	Definition
ABC	Adelaide Brighton Cement
Air EPP	South Australian Environment Protection (Air Quality) Policy 2016
APMP	ABC's Air Particulate Management Plan
GLPMRP	ABC's Ground Level Particulate Monitoring and Reporting Plan
EPA	Environment Protection Authority
TARP	Trigger Action Response Plan

1.0 Purpose

To provide the framework for the measurement, monitoring and reporting of ground level particulate concentrations (TSP, PM₁₀ and PM_{2.5}), from a network of monitors located within and external to the site premises, to assist with managing and reducing fugitive particulate emissions from activities on the site.

2.0 Scope

The plan addresses

- Objectives of the monitoring
- Monitoring of particulate emissions at locations within and outside the site boundary
- Sampling and testing procedures
- Calibration and maintenance of particulate monitors
- Reporting methodology
- Public access to monitoring of particulate emissions measured by offsite monitor

3.0 Introduction

ABC has a network of onsite and offsite, ground level particulate monitors that continuously measure particulate size fractions (PM₁₀, PM_{2.5} and TSP), wind speed and direction.

These monitors provide data that assist with developing strategies to reduce fugitive particulate emissions from activities on the site.

4.0 Monitoring plan objectives

The objectives of this plan are to:

- Measure, monitor and report ground level particulate concentrations as TSP, PM₁₀ and PM_{2.5} at four locations within the site boundary (Block 9, Northern Grounds, Eastern Grounds and Southern Grounds) and at a location outside the site boundary (Community Park).
- Provide public access to monitoring of PM₁₀ and PM_{2.5} data from monitoring stations located outside the site boundary at Community Park.
- Provide public access, within 48 hours, to an explanation for particulate measurements from monitoring stations located outside the site boundary at the Community Park, when the measured particulate concentrations exceed the following criteria;
- PM₁₀ concentration of 50 micrograms per cubic metre over a 24-hour averaging period
- PM_{2.5} concentration of 25 micrograms per cubic metre over a 24-hour averaging period
- Provide data input to the Air Particulate Management Plan to facilitate ongoing implementation of dust control measures to minimise offsite dust from the Facility.

5.0 Licence requirements and applicable legislation

South Australian Environment Protection Act 1993

South Australian Environment Protection Regulations 2009

South Australian Environment Protection (Air Quality) Policy 2016 (Air EPP)

The air quality criteria that are relevant to dust emissions from the Facility are reproduced in Table 1.

Table 1 Relevant criteria from the Air EPP Schedule 2 (unless noted otherwise)

Pollutant	Classification	Averaging time	Maximum concentration ($\mu\text{g}/\text{m}^3$)
Particles as PM_{10}	Toxicity	24 hours	50
Particles as $\text{PM}_{2.5}$	Toxicity	24 hours	25
		12 months	8

Adelaide Brighton Cement's EPA Licence No1126, 1/11/2022, condition 4.4

4.4 GROUND LEVEL PARTICULATE MONITORING AND REPORTING PLAN (U - 1555)

The Licensee must:

4.4.1 *develop and submit to the satisfaction of the EPA by the compliance date listed below a Ground Level Particulate Monitoring and Reporting Plan;*

4.4.2 *ensure that the Ground Level Particulate Monitoring and Reporting Plan includes, but need not be limited to:*

- a measurement and monitoring of ground level particulate concentrations (as TSP, PM_{10} and $\text{PM}_{2.5}$) at various locations within the Premises and outside the Premises;*
- b a methodology and framework for the provision of public access to real-time monitoring data of PM_{10} and $\text{PM}_{2.5}$ from monitoring stations located outside the Premises;*
- c a methodology for providing public access to an explanation within 48 hours of why the following particulate limits are exceeded at monitoring locations outside the Premises;*
 - i a PM_{10} concentration of 50 micrograms per cubic metre over a 24 hour averaging period; and*
 - ii a $\text{PM}_{2.5}$ concentration of 25 micrograms per cubic metre over a 24 hour averaging period;*
- d a methodology and framework for providing public access to the Ground Level Particulate Monitoring and Reporting Plan (or any revised plan approved by the EPA) and to quarterly and annual reporting;*

4.4.3 *submit a quarterly report to the EPA by the last day of January, April, July and October of each year;*

- 4.4.4 submit an annual report to the EPA by the last day of October of each year; and
- 4.4.5 implement the Ground Level Particulate Monitoring and Reporting Plan approved in writing by the EPA (or any revised plan approved in writing by the EPA).

Compliance Date: 30-Jun-2023

Adelaide Brighton Cement's EPA Licence No1126, 1/11/2022, condition 1.2

1.2 GROUND LEVEL PARTICULATE NOTIFICATION (U - 765)

The Licensee must:

1.2.1 provide notification to the EPA, within 48 hours, when the following particulate limits are exceeded at any of its monitoring locations outside the Premises:

- a a PM10 concentration of 50 micrograms per cubic metre over a 24 hour averaging period; or
- b a PM2.5 concentration of 25 micrograms per cubic metre over a 24 hour averaging period;

1.2.2 ensure any notification provided under sub paragraph 1 of this condition includes but is not limited to:

- a the date;
- b the cause;
- c the measured particulate concentration over the 24 hour averaging period; and
- d remedial actions taken to reduce particulate emissions from the Premises.

6.0 Responsibilities

The following general responsibilities apply in relation to this management plan

Position	Responsibility
Manager - Reliability Birkenhead	Responsibility and authority to ensure <ul style="list-style-type: none"> • Maintenance of ambient monitoring equipment • Calibration of ambient monitoring equipment • Maintenance of calibration and service records • Maintenance staff have relevant skills/training to maintain monitoring equipment
Manager Production	Responsible for: <ul style="list-style-type: none"> • Implementation of this Ground Level Particulate Monitoring and Reporting plan
Advisor Environment - C&L (SA/NSW/NT)	Responsible for: <ul style="list-style-type: none"> • Annual, quarterly and exceedance reporting requirements of this plan

Position	Responsibility
	<ul style="list-style-type: none"> • Maintenance of website
General Manager Operations SA/NT/NSW	<ul style="list-style-type: none"> • Responsible for ensuring compliance with this Ground Level Particulate Monitoring and Reporting Plan • Ensuring employees are aware of the site EPA licence conditions, and reporting requirements relating to this plan • Provision of resources to reasonably and practically implement the intent of this plan

7.0 Background information

7.1 Activities conducted on site

- Cement Works
- Activities producing listed waste
- Bulk shipping facility
- Crushing, grinding or milling; rock, ores or minerals
- Fuel burning

7.2 Sources of particulate dust on the Birkenhead site

Fugitive particulate dust is generated on site by the following activities

- Exposed and unsealed areas
- External material stockpiles
- Vehicle movements
- Material conveyor and transfer systems
- Dust collector units associated with processing and storage facilities

7.3 Details of the receiving environment and sampling locations

- Plant is located adjacent to the Port River, Northern side of the Birkenhead Bridge
- Plant is adjacent to a residential area
- Proximity of sensitive receptors to the site is shown in figure 1

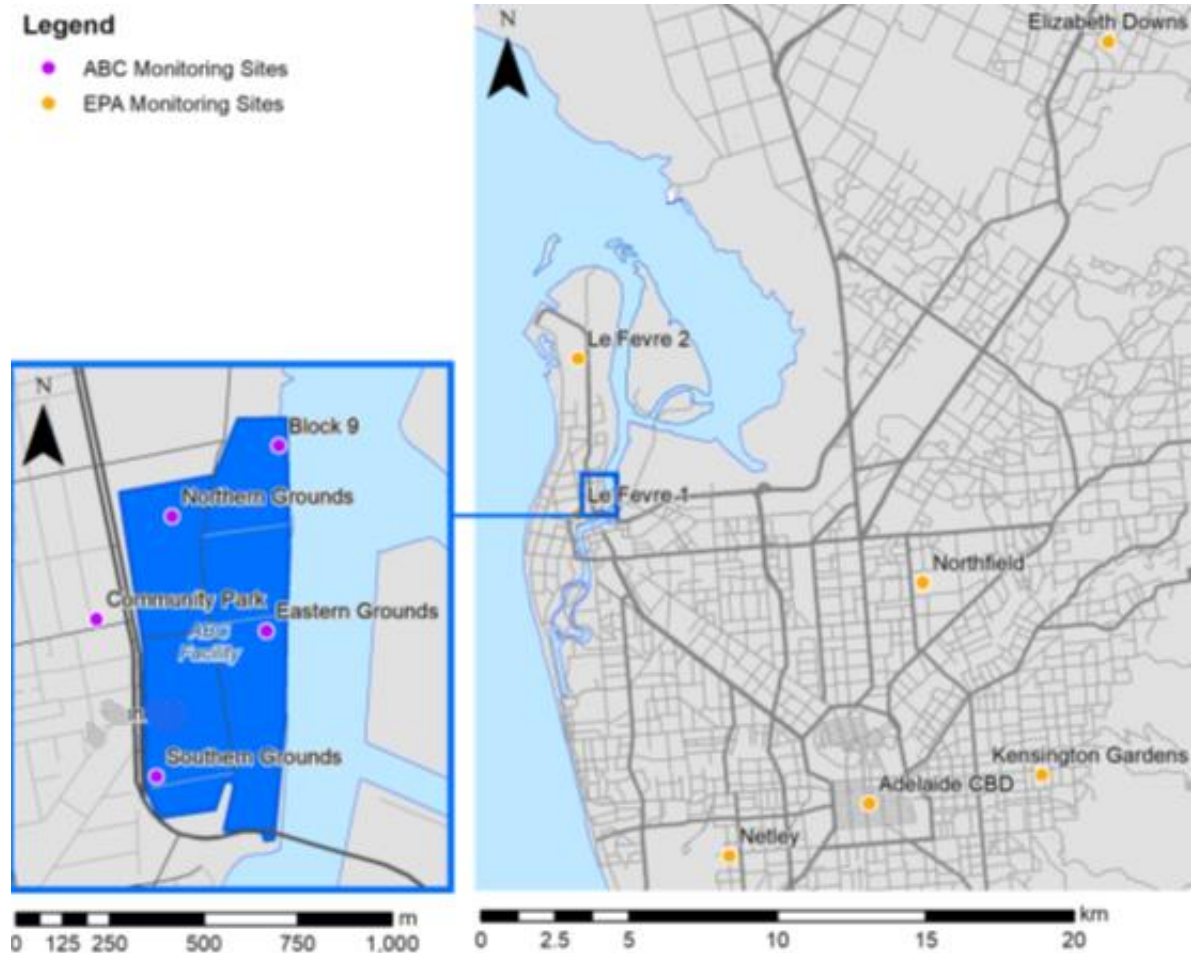


Figure 1:

On-site particulate monitors are located strategically around the site to allow ABC to manage dust emissions from site operations.

An offsite particulate monitor is located at the Community Park, located on the corner of Alfred Street and Hargrave Street, Peterhead, 5016. ABC, is currently seeking to find a suitable location for an air particulate monitor to replace the Gunn Street, Birkenhead 5015, monitor, following the sale and redevelopment of the site (not owned by ABC). Appendix A contains details of locations that are under consideration for a monitoring station and the process required for approval and implementation.

Sampling locations are indicated by colour coded points on the aerial photograph below.



8.0 Sampling and testing procedures

Particulate sampling details are as follows;

- Five DustTrak DRX Aerosol Monitors (model 8533), which continuously measure PM2.5, PM10 and TSP.
- Off-site monitor is located at the Community Park.
- On site monitors are located on the Northern, Southern and Eastern Grounds and Block 9.
- Wind speed and direction at each particulate monitor is measured continuously by a Vaisala Windcap Ultrasonic Wind Sensor WMT52.
- To provide continuity of monitoring during periods of calibration or outages for maintenance, a spare calibrated DustTraK DRX Aerosol Monitor (model 8533) is held.

8.1 Maintenance and calibration of particulate monitors

Calibration

- Particulate monitors are calibrated on an annual basis, by the supplier who are NATA accredited for the calibration. Calibration certificates are issued confirming the instrument accuracy against the relevant reference standards.

Service

- A yearly service in line with manufacturer's recommendations is performed by the supplier on an annual basis at the time of calibration.
- Routine maintenance and inspection checks are undertaken on a three monthly basis.

Maintenance and calibration records are kept onsite.

9.0 Reporting methodology

To meet its reporting requirements, ABC has developed and maintains

- A cloud based data collection and storage system
- A website for display of offsite monitoring data
- Particulate exceedance reporting for off-site monitor
- Reporting of monitoring data

9.1 Data collection and storage system

The data collection and storage system (Data System) consists of the following elements:

- A cloud based FTP server for receiving monitoring data from ABC's monitoring network
- Automated validation of all data, with alerts generated on missing or erroneous data
- Additional data streams such as EPA monitoring and meteorological forecasts
- Database for storage of all data
- Automated backup of all data.
- Automated alerts for loss of data availability

9.2 Web site

A website is used to provide public access to real time 24-hour average concentrations of PM₁₀ and PM_{2.5} measured at the ABC offsite monitor (Community Park).

The website has the following elements updated in real time:

- A time series graph showing the most recent week of 24-hour average data with the air quality standard clearly marked for the two ABC offsite monitor and the EPA Le Fevre 1 monitor
- Map of monitoring locations
- Summary of meteorological conditions in the form of a wind rose
- Estimate of the contribution of different wind directions to the ambient concentration in the form of a dust rose

- Incident report section, for providing public access to an explanation of an exceedance
- Information page that includes instructions on how to read a wind rose, how to read a dust rose, definitions of PM10 and PM2.5 and other dust metrics.

9.3 Exceedance reporting

An automatic reporting system for particulate exceedances at off site monitor (Community Park) where particulate levels exceed the following levels;

PM10 50 micrograms per cubic metre (24 hour average)

PM2.5 25 micrograms per cubic metre (24 hour average)

The report will include the following elements:

- Date
- Measured Particulate concentration over the 24 hr period
- Wind roses
- Dust roses
- Remedial actions taken to reduce particulate emissions from the site
- Explanation/interpretation of the monitoring data exceedance
- A public report will be published on the website within 48 hours

9.4 Quarterly and annual reporting to the EPA

All reports will clearly identify the EPA licence number, name and address where the licence activity is conducted, name and contact details of the person submitting the report.

9.4.1 Quarterly reports

Quarterly reports to include the following:

- Monitoring data for each monitor (on site and off site) as follows
 - Monthly wind rose showing the distribution of wind directions
 - Monthly dust rose showing the distribution of PM10 concentration
 - Monthly dust rose showing the distribution of PM2.5 concentration
- Particulate monitoring data for each ABC monitor (on site and off site) including EPA monitor (LeFevre 1) for comparison as follows;
- Monthly time series graph of 24-hour average PM10 concentration reported against the Air EPP for PM10 of 50 micrograms per cubic metre (24 hour average).
- Monthly time series graph of 24-hour average PM2.5 concentration reported against the Air EPP for PM2.5 of 25 micrograms per cubic metre (24-hour average).
- Quarterly reports will be submitted to the EPA, within 30 days of the end of the calendar quarter, i.e., reports due last day of January, April, July, October

9.4.2 Annual report

Annual report to include the following:

- Monitoring data for each monitor (on site and off site) including EPA monitor (LeFevre 1) for comparison as follows
 - Yearly time series graph of 24-hour average PM10 concentrations reported against the Air EPP for PM10 of 50 micrograms per cubic metre (24 hour average).
 - Yearly time series graph of 24-hour average PM2.5 concentrations reported against the Air EPP for PM2.5 of 25 micrograms per cubic metre (24 hour average).

Annual reports will be submitted to the EPA by 31 October each year.

9.4.3 Public access to reports and Ground Level Particulate Monitoring and Reporting Plan

- Quarterly and annual reports by the EPA, they will be made available on the ABC Community Web Site.
- A copy of the current version of this Plan, as approved by the EPA, will be made available on the ABC Community Web Site.

10.0 Plan review

This monitoring and reporting plan provides data input into the ABC Air Particulate Management Plan (APMP) to facilitate the ongoing implementation of dust control measures, development of trigger action response plans and strategies to reduce fugitive particulate emissions from activities on the site. The APMP review includes:

- a review of all trigger values
- a review of the effectiveness of all action and response strategies
- a trend analysis of data collected
- a review and analysis of community complaints with the exceedance of trigger values and 24 hour exceedance of PM10 and PM2.5 Air (EPP) criteria
- opportunities for improvement in dust management

At the end of each year, this plan will be reviewed in conjunction with the Air Particulate Management Plan and will include a review of:

- monitoring data
- data availability
- equipment reliability

If amendments to this plan are required, a revised plan is to be provided to the EPA for review and approval before implementation.

11.0 Plan Submission

Submitted by:

Name Craig Mackenzie

Position Advisor Environment

Authorised on behalf of

ADELAIDE BRIGHTON CEMENT LTD.

Dated: 09/10/2023

12.0 Plan Approval

Approved by:

.....

DELEGATE OF THE ENVIRONMENT PROTECTION AUTHORITY

Signed :

Dated :/...../.....

Appendix A

Potential community locations for an ambient particulate monitor and required approval process

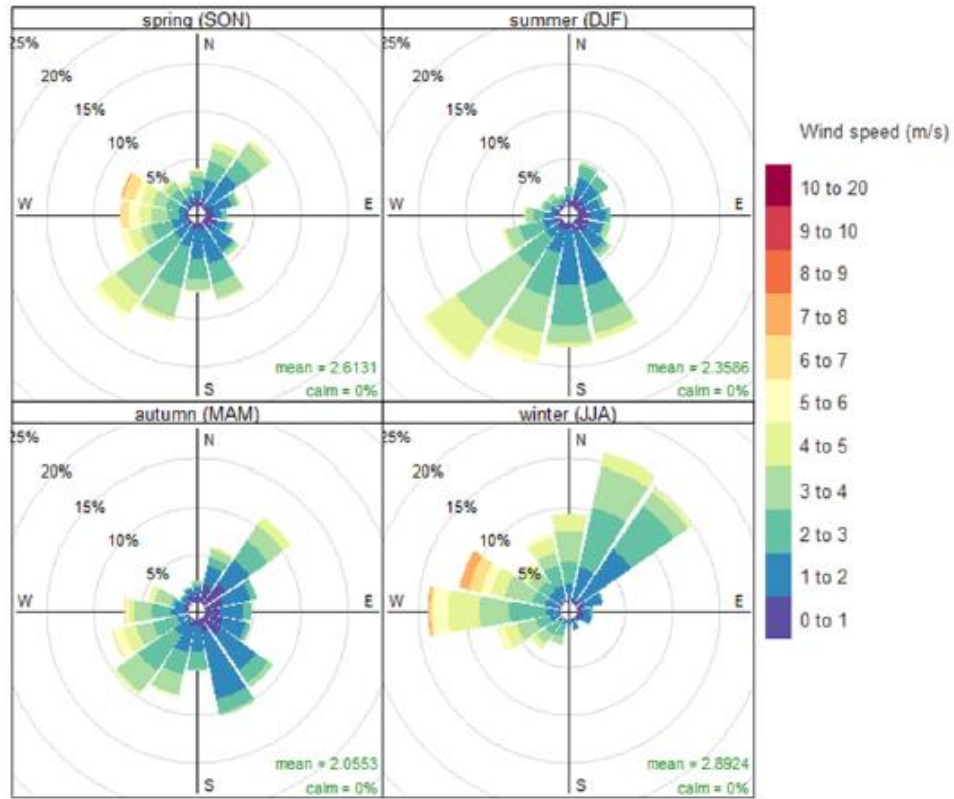
Monitoring locations need to meet a number of siting requirements in order to be suitable. The Australian standard AS/NZS 3580.1.1: 2016 Methods for sampling and analysis of ambient air Part 1.1: Guide to siting air monitoring equipment provides guidance for selection of suitable sites for locating monitors to measure ambient levels of PM10, PM2.5 and TSP particulates.

In summary a suitable monitoring location will also need to meet the following requirements:

- Located downwind of ABC operations (predominant wind directions in the area are N/E and SW - Wind roses for the Birkenhead area are shown in Figure A1 Seasonal distribution of winds at the Facility)
- Close to the ABC site
- Located in compliance with Australian Standards for ambient particulate monitoring
 - In free space, without interference from trees, buildings, and significant road traffic
- Preferably mains power availability or alternatively suitable space /orientation for solar panels
- Secure site (publicly safe installation and protection of equipment from vandalism etc.)
- Able to be accessed 24/7 for maintenance and service in a safe and secure environment in accordance with occupational health and safety regulatory requirements
- Noise from monitoring equipment and maintenance activities does not impact on residents
- The location of the monitoring station should minimise impact on the general activities of the local population and should not be restrictive on the intended use of the location area
- Ideally located on public property

In an urban environment it is likely that there will have to be some compromises in the ideal siting location.

Figure A1



Frequency of counts by wind direction (%)

Seasonal distribution of winds at the Facility (from CALMET)

For reference a typical ambient particulate monitoring station is shown in the photograph below.







The assessment of identified potential monitoring locations in the community is summarised in Table A1 Assessment of potential ambient particulate monitoring locations.



ABC's preferred location is the Naval Reserve in Birkenhead

Table A1: Assessment of potential ambient particulate monitoring locations

Location Description	Photograph of location	Suitability Comments
<p>Birkenhead Naval Reserve (near the toilet facility)</p> <p>Corner Fletcher Rd & Heath St. Birkenhead 5015</p> <p>Preferred Site location</p>		<ul style="list-style-type: none"> • Downwind impact from Birkenhead site operations • Mains power likely to be available • Could be mounted on roof or to building – minimising impact on intended use • Minimal impact on nearby residents • 24/7 Accessibility • Minimal interference from trees/buildings • Minimal impact on intended area use • A bit close to major roads (<50 m) • Potential impact from significant redevelopment of Fletcher Slip area

Location Description	Photograph of location	Suitability Comments
<p>Birkenhead Naval Reserve</p> <p>Alternative location in this reserve under consideration is near the corner Wells Street & Craigie Street Birkenhead 5015</p> <p>Possible location</p>		<ul style="list-style-type: none"> • Downwind impact from Birkenhead site operations • Mains power likely to be available • 24/7 Accessibility • Interference from trees (may require removal of tree plantings) • Monitor will need to be at height to avoid interference of adjacent residential buildings • Impact on nearby residents • Impact on intended area use - adjacent children's playground equipment • Community consultation
<p>Location in area that incorporates the stormwater retention basin, that lies between Victoria Road, Nelson Street and Semaphore Road, Birkenhead, 5015</p> <p>Possible location</p>		<ul style="list-style-type: none"> • Downwind impact from Birkenhead site operations • Mains power – would need to connect to street power supply • Minimal impact on nearby residents • 24/7 Accessibility • Minimal interference from trees/buildings • Minimal impact on intended area use • A bit close to significant traffic volumes on major roads <50 m • Potential impact from significant redevelopment of Fletcher slip area

Location Description	Photograph of location	Suitability Comments
<p>Peter Nicholls Reserve</p> <p>Corner of Fletcher Road & Hargrave Street Birkenhead 5015</p>		<ul style="list-style-type: none"> • Downwind impact from Birkenhead site operations • Mains power – would need to connect to street power supply • Minimal impact on nearby residents • 24/7 Accessibility • Minimal interference from trees/buildings • Impact on intended area use • A bit close to major suburban roads <50 m) • Directly in line (west) with existing Adelaide Brighton Cement Community Dog Park monitor may be of little benefit
<p>Reserve on Tim Hunt Way</p> <p>Peterhead, 5015</p>		<ul style="list-style-type: none"> • Limited downwind impact from Birkenhead site operations • Mains power – would need to connect to street power supply – difficult (underground) • Minimal impact on nearby residents • 24/7 Accessibility • Impact on intended area use • Interference from trees/buildings • A bit close to major suburban roads <50 m) •

Location Description	Photograph of location	Suitability Comments
<p>Stormwater retention basin between Alfred Street and May Street Peterhead 5015</p>		<ul style="list-style-type: none"> • Limited downwind impact from Birkenhead site operations • Mains power – would need to connect to street power supply • Minimal impact on nearby residents • Minimal Interference from trees/buildings • Minimal impact on intended area use • 24/7 Accessibility • Interference from trees/buildings • 100 - 150 m from major traffic (Victoria Road)
<p>115 Victoria Road Peterhead 5015</p>		<ul style="list-style-type: none"> • Limited downwind impact from Birkenhead site operations • Mains power – would need to connect to available power supply • Minimal impact on nearby residents • Minimal impact on intended area use • 24/7 Accessibility • Interference from trees/buildings • Very close to major traffic (Victoria Road) <30 m

The EPA has requested ABC investigate with the City of Port Adelaide Enfield the possibility of locating the monitor on the Northern side of Naval Reserve in preference to the current preferred location at the Southern end of the reserve. Table A2 summarises the approval process for installation of an ambient air particulate monitor in the community.

Table A2 Approval process for installation of an ambient monitor

Step	Responsibility	Indicative timing to complete
ABC to investigate the possibility of locating the monitor on the Northern side of Naval Reserve, Birkenhead	ABC/EPA/ City of Port Adelaide Enfield	31/10/2023
Council property staff prepare a report detailing the ambient air monitoring station for Council consideration	Council property staff	15/12/2023
Subject to completion of the report, Council consider the report.	Council meeting	16/01/2024
Subject to Council approval, Council will undertake community consultation	Council staff	16/02/2024
Council review Community consultation outcome	Council meeting	5/03/2024
Subject to successful community consultation ABC will submit a Development Application (DA)	ABC	30/03/2024
Subject to DA approval, ABC will install monitor	ABC	31/07/2024