

**Impact Fertilisers Pty Ltd, Derwent Park
Quarterly Monitoring Program
Emission Testing Report - October 2022
Report Number R013749**

Document Information

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Client Name: Impact Fertilisers Pty Ltd
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Report Authorisation



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No. 14601

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration, and inspection reports.

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Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.

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1 Executive Summary

1.1 Background

Ektimo was engaged by Impact Fertilisers Pty Ltd to perform emission monitoring as part of ongoing environmental compliance monitoring. The sampling conducted constituted the quarterly monitoring program.

1.2 Project Objective & Overview

The objective of the project was to conduct a monitoring programme to quantify emissions from various locations to determine whether they were compliant with Impact Fertilisers Pty Ltd's EPN licence 7316/2.

Monitoring was performed as follows:

Location	Test Date	Test Parameters
Broadfield Mixer Scrubber Stack (Den Stack)*	13 October 2022	Total particulate matter Total gaseous and particulate fluoride
Mill Baghouse*		Total particulate matter
Ambient Site: Birch Rd **	11 – 12 October 2022	Ambient fluoride (as HF)

* Flow rate, velocity, temperature, and moisture were also determined.

** Flow rate, velocity, temperature, and moisture were not determined.

All results are reported on a dry basis at STP.

1.3 Licence Comparison

The following licence comparison table shows that all analytes highlighted in green are within the licence limit set by the Tasmanian Environmental Protection Notice (EPN) as per licence 7316/2 (last amended on 8 July 2019).

Location Description	Pollutant	Units	Licence limit	Detected values 11 - 13 October 2022
Broadfield Mixer Scrubber Stack	Fluoride (as F)	mg/m ³	50	21
	Particulates	mg/m ³	100	26
Mill Baghouse Stack	Particulates	mg/m ³	250	12
Birch Road	Ambient fluoride (as HF)	µg/m ³ 24 hour average	2.9	1.6

Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.

Refer to the Test Methods table for the measurement uncertainties.

2 Results

2.1 Broadfield Mixer Scrubber Stack (Den Stack)

Date	13/10/2022	Client	Impact Fertilisers Pty Ltd
Report	R013749	Stack ID	Broadfield Mixer Scrubber Stack
Licence No.	7316/2	Location	Derwent Park
Ektimo Staff	G Trenear & T Bakas	State	TAS
Process Conditions	Feed rate: 27.5t/hr Rock type: Straight Egyptian in S1C = rate of 47%, Straight Egyptian in S1D = rate of 49%, 2 buckets of Egyptian, 1 bucket of Bauxite in S1E = rate of 4%		

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Sampling Plane Details	
Sampling plane dimensions	900 mm
Sampling plane area	0.636 m ²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Horizontal Circular
Downstream disturbance	Centrifugal fan 1 D
Upstream disturbance	Bend 1 D
No. traverses & points sampled	1 10
Sample plane conformance to AS 4323.1	Non-conforming
Comments	
The number of traverses sampled is less than the requirement	
The number of points sampled is less than the requirement	
The discharge is assumed to be composed of dry air and moisture	
The sampling plane is deemed to be non-conforming due to the following reasons:	
The highest to lowest gas velocity ratio exceeds 1.6:1	
The upstream disturbance is <2D from the sampling plane	
The stack or duct does not have the required number of access holes (ports)	
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D	

Stack Parameters		
Moisture content, %v/v	17	
Gas molecular weight, g/g mole	27.1 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.21 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	0.97	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1334 & 1452	
Temperature, °C	61	
Velocity at sampling plane, m/s	16	
Volumetric flow rate, actual, m ³ /min	600	
Volumetric flow rate (wet STP), m ³ /min	480	
Volumetric flow rate (dry STP), m ³ /min	400	
Mass flow rate (wet basis), kg/hour	35000	

Isokinetic Results	Sampling time	Results	
		Concentration mg/m ³	Mass Rate g/min
Total particulate matter		26	10
Particulate fluoride (as F)		1	0.4
Gaseous fluoride (as F)		20	8.1
Total fluoride (as F)		21	8.5
Isokinetic Sampling Parameters			
Sampling time, min		60	
Isokinetic rate, %		93	
Gravimetric analysis date (total particulate)		27-10-2022	

2.2 Mill Baghouse

Date	13/10/2022	Client	Impact Fertilisers Pty Ltd
Report	R013749	Stack ID	Mill Baghouse
Licence No.	7316/2	Location	Derwent Park
Ektimo Staff	G Trenear & T Bakas	State	TAS
Process Conditions	Feed rate: 27.5 t/hr Rock type: Straight Egyptian in S1C = rate of 47%, Straight Egyptian in S1D = rate of 49%, 2 buckets of Egyptian, 1 bucket of Bauxite in S1E = rate		

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Sampling Plane Details	
Sampling plane dimensions	600 mm
Sampling plane area	0.283 m ²
Sampling port size, number	1 Holes (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2 D
Upstream disturbance	Centrifugal fan 2 D
No. traverses & points sampled	2 12
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments
 The discharge is assumed to be composed of dry air and moisture

The sampling plane is deemed to be non-ideal due to the following reasons:
 The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
 The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	3.7	
Gas molecular weight, g/g mole	28.6 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.27 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	1.09	

Gas Flow Parameters	
Flow measurement time(s) (hhmm)	1347 & 1513
Temperature, °C	44
Velocity at sampling plane, m/s	13
Volumetric flow rate, actual, m ³ /min	220
Volumetric flow rate (wet STP), m ³ /min	190
Volumetric flow rate (dry STP), m ³ /min	180
Mass flow rate (wet basis), kg/hour	15000

Isokinetic Results	Sampling time	Results	
		Concentration mg/m ³	Mass Rate g/min
Total particulate matter		12	2.3
Isokinetic Sampling Parameters			
Sampling time, min		60	
Isokinetic rate, %		95	
Gravimetric analysis date (total particulate)		27-10-2022	

2.3 Ambient Site: Birch Rd



Ambient Fluoride Sampling Location	Birch Rd
Co-ordinates	S 42°50'09 E 147°18'45
Siting in compliance with AS2922	Yes
Start Date and Time	11/10/2022 13:00
Finish Date and Time	12/10/2022 12:50
Average Temp (°C)	16
Barometric pressure (mBar)	1019
Particulate Fluoride Concentration (as HF) ($\mu\text{g}/\text{m}^3$) at Wet NTP (average per day)	0.32
Gaseous Fluoride Concentration (as HF) ($\mu\text{g}/\text{m}^3$) at Wet NTP (average per day)	1.3
Total Fluoride Concentration (as HF) ($\mu\text{g}/\text{m}^3$) at Wet NTP (average per day)	1.6

Refer to "WEATHER OBSERVATIONS" in the appendix.

Refer to "AMBIENT FLUORIDE SAMPLING LOCATIONS" in the appendix.

3 Test Methods

All sampling and analysis performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited	
				Sampling	Analysis
Sampling points - Selection	AS 4323.1	NA	NA	✓	NA
Flow rate & velocity	AS 4323.1	AS 4323.1	8%, 7%	✓	✓
Moisture	USEPA Method 4	USEPA Method 4	8%	✓	✓
Moisture (stacks <60°C)	Ektimo 050	Ektimo 050	not specified	✓	✓
Total particulate matter	AS 4323.2	AS 4323.2	7%	✓	✓ ^{††}
Total fluoride	USEPA Method 13B	ALS in-house method EA144C & Ektimo 235	17%	✓	✓ ^{#,†}
Ambient gaseous & acid soluble particulate fluoride	AS 3580.13.2	AS 3580.13.2 & ALS in-house method EA144C	not specified	✓	✓ [#]

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* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

† Analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601. Results were reported on:
 3 November 2022 in report LV-003489.
 3 November 2022 in report LV-003488.

†† Gravimetric analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601.

Analysis (solid fluoride only) performed by Australian Laboratory Services Pty Ltd, NATA accreditation number 825. Results were reported to Ektimo on 28 October 2022 in report EN2210381.

4 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

5 Definitions

The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
D	Duct diameter or equivalent duct diameter for rectangular ducts
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
EPA	Environment Protection Authority
FTIR	Fourier transform infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NIOSH	National Institute of Occupational Safety and Health
NT	Not tested or results not required
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
TOC	Total organic carbon. This is the sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
XRD	X-ray diffractometry
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range.

6 Appendix 1: Weather Observations

Hobart Tasmania October 2022

Date	Day	Temps		Rain	Max wind gust			9:00 AM					3:00 PM					
		Min °C	Max °C		Dir	Spd km/h	Time local	Temp °C	RH %	Cld g ^h	Dir	Spd km/h	MSLP hPa	Temp °C	RH %	Cld g ^h	Dir	Spd km/h
11	Tu	7.9	19.8	0.4	NE	37	15:57	12.4	71	NNW	13	1024.6	17.6	53	E	13	1020.8	
12	We	10.5	18.8	0	NNE	44	18:36	15.3	69	NNE	7	1021.5	18.3	65	NNE	22	1018.8	
13	Th	14.3	17.7	0.6	N	56	19:29	16.3	75	NNE	17	1011.7	16.9	76	NE	19	1007.7	
Statistics for October 2022																		
	Mean	8.7	16.9					12.3	70		14	1014.3	15.4	60		18	1012.5	
	Lowest	3.1	12.3	0				8.2	48	Calm		978.6	10.6	38	SSW	9	979	
	Highest	14.3	24.3	18.6	WNW	91		18.1	98	S	35	1036	23.2	94	WNW	39	1032.9	
	Total			90.2														

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7 Appendix 2: Ambient Fluoride Sampling Locations



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