



Address (Head Office)  
427 Canterbury Road  
SURREY HILLS VIC 3127

Office Locations  
VIC NSW WA QLD

Postal Address  
Unit 13, 9 Ambitious Link  
BIBRA LAKE WA 6163

Freecall: 1300 364 005  
[www.ektimo.com.au](http://www.ektimo.com.au)  
ABN: 86 600 381 413

**Report Number R002740**

---

**Emission Testing Report  
Industrial Galvanizers, Girraween**

---

## Document Information

Client Name: Industrial Galvanizers  
 Report Number: R002740  
 Date of Issue: 23 May 2016  
 Attention: John Bagley  
 Address: 20-22 Amax Ave  
 Girraween NSW 2145  
 Testing Laboratory: Ektimo (EML) ABN 98 006 878 342

## Report Status

Format	Document Number	Report Date	Prepared By	Reviewed By (1)	Reviewed By (2)
Preliminary Report	-	-	-	-	-
Draft Report	-	-	-	-	-
Final Report	R002740	23/05/2016	JWe/JKr	DHi	HTh
Amend Report	-	-	-	-	-

Template Version: 160330

## Amendment Record

Document Number	Initiator	Report Date	Section	Reason
Nil	-	-	-	-

## Report Authorisation



**Heath Thatcher**  
Operations Manager

NATA Accredited Laboratory  
No. 2732

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

## Table of Contents

---

1	Licence Comparison .....	<b>Error! Bookmark not defined.</b>
2	Executive Summary .....	4
3	Results .....	5
3.1	Main Stack .....	5
3.2	Spinning Mill Baghouse Stack .....	6
4	Plant Operating Conditions .....	7
5	Test Methods.....	7
6	Quality Assurance/ Quality Control Information .....	7
7	Definitions .....	8

## 1 EXECUTIVE SUMMARY

Ektimo was engaged by Industrial Galvanizers to perform emission testing to determine the emissions to air as detailed below;

Results from this stack emission monitoring program indicate that Industrial Galvanizers was compliant with requirements of Licence 1895 during the sampling period.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
Main Stack	9 May 2016	Solid particles, zinc
Spinning Mill Baghouse Stack	9 May 2016	Solid particles, zinc

\* Flow rate, velocity, temperature and moisture were determined unless otherwise stated

The sampling methodologies chosen by Ektimo are those recommended by the NSW Office of Environment and Heritage (as specified in the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007*).

All results are reported on a dry basis at STP. Unless otherwise indicated, the methods cited in this report have been performed without deviation.

Plant operating conditions have been noted in the report.

## 2 LICENCE COMPARISON

EPA No.	Location Description	Pollutant	Units	Licence limit	Detected values
					9/05/16
1	Main Stack	Solid particles	mg/m <sup>3</sup>	100	<2
2	Spinning Mill Baghouse Stack	Solid particles	mg/m <sup>3</sup>	100	2.8

Note: All analytes highlighted in green are below the licence limit set by the NSW EPA as per licence 1895 (last amended on 22/09/2015).

### 3 RESULTS

#### 3.1 Main Stack

Date	9/05/2016	Client	Industrial Galvanizers
Report	R002740	Stack ID	Main Stack
Licence No.	1895	Location	Girraween
Ektimo Staff	David Hill & Ryan Collins	State	NSW
Process Conditions	Please refer to client records.		

#### Sampling Plane Details

Sampling plane dimensions	1200 mm
Sampling plane area	1.13 m <sup>2</sup>
Sampling port size, number	4" BSP (x2)
Access & height of ports	Elevated work platform 25 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 15 D
Upstream disturbance	Junction 12 D
No. traverses & points sampled	2 12
Compliance of sample plane to AS4323.1	Ideal

#### Comments

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

#### Stack Parameters

Moisture content, %v/v	1.8
Gas molecular weight, g/g mole	28.8 (wet) 29.0 (dry)
Gas density at STP, kg/m <sup>3</sup>	1.28 (wet) 1.29 (dry)

#### Gas Flow Parameters

Measurement time (hhmm)	0945
Temperature, °C	31
Velocity at sampling plane, m/s	20
Volumetric flow rate, discharge, m <sup>3</sup> /s	22
Volumetric flow rate (wet STP), m <sup>3</sup> /s	20
Volumetric flow rate (dry STP), m <sup>3</sup> /s	20
Mass flow rate (wet basis), kg/hour	92000

#### Isokinetic Sampling Parameters

Sampling time, min	60
Isokinetic rate, %	100
Velocity difference, %	<1

Isokinetic Results	Results	
	Concentration mg/m <sup>3</sup>	Mass Rate g/min
Sampling time	0955-1055	
Solid Particles	<2	<2
Zinc	0.069	0.081

### 3.2 Spinning Mill Baghouse Stack

Date	9/05/2016	Client	Industrial Galvanizers
Report	R002740	Stack ID	Spinning Mill Baghouse Stack
Licence No.	1895	Location	Girraween
Ektimo Staff	David Hill & Ryan Collins	State	NSW
Process Conditions	Please refer to client records.		

Sampling Plane Details	
Sampling plane dimensions	450 mm
Sampling plane area	0.159 m <sup>2</sup>
Sampling port size, number	4" BSP (x2)
Access & height of ports	Elevated work platform 3 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 12 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 12
Compliance of sample plane to AS4323.1	Compliant but non-ideal <sup>(1)</sup>
Comments	
The discharge is assumed to be composed of dry air and moisture	

Stack Parameters		
Moisture content, %v/v	1	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m <sup>3</sup>	1.29 (wet)	1.29 (dry)
Gas Flow Parameters		
Measurement time (hhmm)	1130	
Temperature, °C	32	
Velocity at sampling plane, m/s	23	
Volumetric flow rate, discharge, m <sup>3</sup> /s	3.7	
Volumetric flow rate (wet STP), m <sup>3</sup> /s	3.3	
Volumetric flow rate (dry STP), m <sup>3</sup> /s	3.2	
Mass flow rate (wet basis), kg/hour	15000	
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	100	
Velocity difference, %	-2	

Isokinetic Results	Results	
	Concentration mg/m <sup>3</sup>	Mass Rate g/min
Sampling time	1140-1240	
Solid Particles	2.8	0.55
Zinc	0.18	0.035

**(1) The sampling plane is deemed to be non-ideal or non-compliant due to the following reasons:**

The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

## 4 PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See Industrial Galvanizers's records for complete process conditions.

## 5 TEST METHODS

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

Parameter	Sampling Method	Analysis Method	Method Detection Limit	Uncertainty*	NATA Accredited	
					Sampling	Analysis
Sample plane criteria	NSW TM-1	NA	NA	-	✓	NA
Moisture content	NSW TM-22	NSW TM-22	0.004	19%	✓	✓
Temperature	NSW TM-2	NA	0°C	2%	✓	NA
Flow rate	NSW TM-2	NA	Location specific	8%	✓	NA
Velocity	NSW TM-2	NA	2ms-1	7%	✓	NA
Solid particles	NSW TM-15	NSW TM-15	0.001g/m <sup>3</sup>	5%	✓	✓
Zinc	NSW TM-12, NSW TM-13, NSW TM-14	Envirolab inhouse	Analyte specific	15%	✓	✓ <sup>1</sup>

\* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

- 1 Analysis performed by Envirolab, NATA accreditation number 2901. Results were reported to Ektimo on 19 May 2016 in report number 146478

## 6 QUALITY ASSURANCE/ QUALITY CONTROL INFORMATION

Ektimo (EML) and Ektimo (ETC) are 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](http://www.nata.com.au).

Ektimo (EML) and Ektimo (ETC) are accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025. – General Requirements for the Competence of Testing and Calibration Laboratories. ISO/IEC 17025 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 Compliance Manager.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world –wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

## 7 DEFINITIONS

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

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, unless otherwise specified.
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.
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
TOC	The sum of all compounds of carbon which contain at least one carbon to carbon bond, plus methane and its derivatives.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
PM <sub>2.5</sub>	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PM <sub>10</sub>	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D <sub>50</sub>	'Cut size' of a cyclone defined as the particle diameter at which the cyclone achieves a 50% collection efficiency ie. half of the particles are retained by the cyclone and half are not and pass through it to the next stage. The D <sub>50</sub> method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D <sub>50</sub> of that cyclone and less than the D <sub>50</sub> of the preceding cyclone.
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
~	Approximately
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
DER	WA Department of Environment & Regulation
DECC	Department of Environment & Climate Change (NSW)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra Red
NATA	National Association of Testing Authorities
RATA	Relative Accuracy Test Audit
AS	Australian Standard
USEPA	United States Environmental Protection Agency
Vic EPA	Victorian Environment Protection Authority
ISC	Intersociety committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
APHA	American public health association, Standard Methods for the Examination of Water and Waste Water
CARB	Californian Air Resources Board
TM	Test Method
OM	Other approved method
CTM	Conditional test method
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
NIOSH	National Institute of Occupational Safety and Health
XRD	X-ray Diffractometry