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REPORT OF PERIODIC MONITORING OF EMISSIONS TO AIR

Part A2 Process: A09/09

EAST ANGLIAN GALVANIZING LTD.

Old North Road
Sawtry
Cambridgeshire
PE28 5XN

Monitoring Date: 11th April 2019

Cti Ref: E70745-2
Customer Ref: PE15996

Report Written By: Peter Holdsworth
MCERTS Registration No.: SIRA MM 04 563
Function: Monitoring Consultant

Signed: Peter Holdsworth

Report Approved By: Trevor Halliday
MCERTS Registration No.: SIRA MM 05 656
Function: Senior Environmental Consultant

Signed: T Halliday

Date: 20th May 2019

The University Of Sheffield.

Advanced Manufacturing Research Centre

MCERTS

UKAS TESTING
0144

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EXECUTIVE SUMMARY REPORT

1.0 MONITORING OBJECTIVES

Sampling of emissions at East Anglian Galvanizing was undertaken at the request of Mr Mark Hammond.

The aim of the monitoring campaign was to:

- undertake annual compliance monitoring.

in accordance with the Site Specific Protocol issued in April 2019 (Cti Ref: E70745-2SSP).

The company is regulated as a Part A2 Process. The available guidance note applicable to the process is:

Sector Guidance Note IPPC SG5 Secretary of State's Guidance for the A2 Galvanising Sector

Emission limits given in the results tables are taken from the requirements given in permit number A09/09.

Tests were performed to quantify the levels of emissions from the following process:

Stack Ref	Emission Source	Substances Monitored
EAG 1	Galvanizing Bath	Particulates

There were no special requirements applicable to the monitoring.

2.0 MONITORING RESULTS

Note: Uncertainty figures quote in this section represent the uncertainty at the 95% confidence level

Stack Ref.: EAG 1 Galvanizing Bath

Particulates	Test 1	Test 2	Emission Limit Value
Concentration:	6.4 mg m^{-3}	7.0 mg m^{-3}	< 15 mg m^{-3}
Mass Release:	89 g hr^{-1}	94 g hr^{-1}	-
Uncertainty:	± 0.93 mg m^{-3}	± 0.97 mg m^{-3}	-
Reference Conditions:	273K and 101.3kPa, without correction for water vapour content		
Date:	11/04/19	11/04/19	-
Test Period:	11:04 to 11:20 11:22 to 11:38	13:00 to 13:16 13:19 to 13:35	-
Duration:	32 mins	32 mins	-
Velocity:	6.6 m s^{-1}	6.3 m s^{-1}	-
Process Status:	Dipping as normal	Dipping as normal	-
Visibility:	No visible emission	No visible emission	Free from persistent visible emission
Monitoring Method:	BS EN 13284-1:2017 Determination of low range mass concentrations of dust		
Isokinetic Rate:	101 %	102 %	95 to 115 %
Blank Value:	0.42 mg m^{-3}	0.43 mg m^{-3}	< 10 % ELV
Cti Accreditation for Use of Method:	MCERTS	MCERTS	-
Accreditation Status of Test:	MCERTS	MCERTS	-

3.0 OPERATING INFORMATION

Stack Ref.	Date	Process Type	Fuel	Feedstock	Abatement Type & operational status if abnormal	Load	Substance	Periodic Monitoring Result	Units
EAG 1	11/04/19	Semi-continuous	Not applicable	Molten Zinc	None	Normal	Particulates [M]	6.7	mg m^{-3}

Accreditation Status of test – (M) MCERTS (U) UKAS (N) None

4.0 MONITORING DEVIATIONS

There were no deviations from the planned monitoring methods.

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APPENDIX I

GENERAL INFORMATION

A) Monitoring Organisation Staff Details

The following Cti staff were involved in the monitoring work reported:

Name	MCERTS Registration	Personnel Competency					Function
			TE1	TE2	TE3	TE4	
Peter Holdsworth	SIRA MM 04 563	L2	✓	✓	✓	✓	Monitoring Consultant
Lewis Pygott	SIRA MM 18 1510	Trainee	-	-	-	-	Monitoring Technician

B) Monitoring Organisation Method Details

The following methods were used for the monitoring work reported:

Substance	Standard Method	Cti OP	Accreditation
All	-	300, 303, 310	-
Moisture (Water Vapour)	BS EN 14790:2017	334	MCERTS
Velocity, Temperature & Pressure	BS EN ISO 16911-1:2013	311, 331 – 336, 361, 396	MCERTS
Particulates	BS EN 13284-1:2017	311, 331 – 336, 361	MCERTS

C) Monitoring Organisation Equipment Check List References

Specific equipment items used were recorded on site sampling datasheets during the monitoring campaign which are held in the Cti environmental monitoring files alongside the associated report.

D) Sub-contract Analysis Details

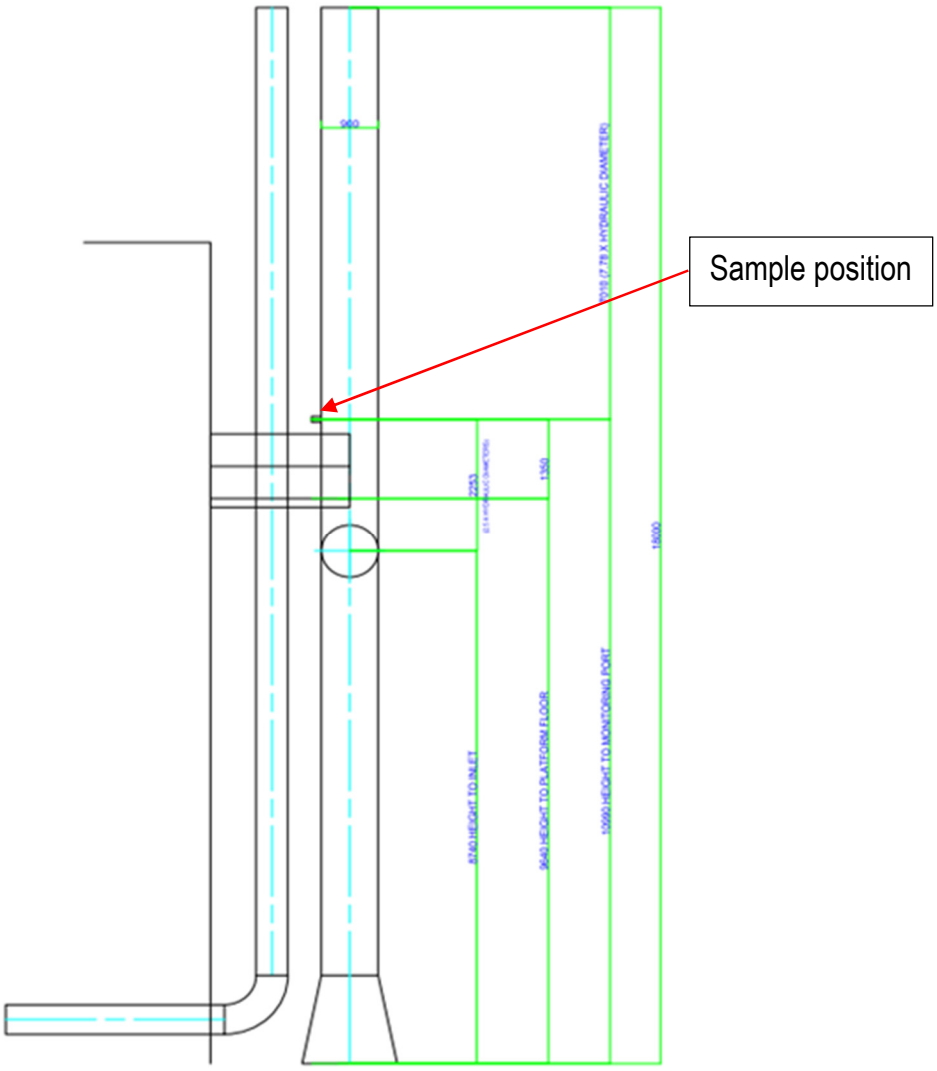
There was no sub-contract analysis associated with the work reported.

APPENDIX II

Stack Ref.: EAG 1 Galvanizing Bath

Emission Source	EAG 1	Galvanizing Bath
Substances monitored:	Particulates	
Arrestment:	None	

Emission Point Description:			13284 Compliant
	Duct dimensions:	0.90 m diameter	-
	Location of sampling plane:	In vertical outlet stack	✓
	Type of sampling port:	2 x 4 ” BSP	✓
	Number of sample lines:	Two	✓
	Arrangement of sample lines:	90°	✓
	Orientation of sample lines:	Horizontal	✓
	Gas flow parameters	Flow: angle < 15°, > 5Pa, Ratio < 3:1, no –ve flow	✓



PARTICULATES		QAF 462. Template Version 6 / Jan19 / TH										
VELOCITY CALCULATION												
Site: East Anglian Galv, Sawtry		Plant:	*EAG 1, Galv Extraction*			Date:	11/04/2019					
	Units											
Stack diameter(Ds):	m	0.90										
Stack dimensions(L,W):	m			0.00								
Stack area(As):	m^2	0.636										
Reference temp(Tr):	K	273										
Reference Pressure (Pr):	Pa	101300										
Barometric Pressure (Pb):	mb	1025	102500	Pa								
Static Pressure (Ps):	"H_2O	0.138	34	Pa								
	mmH_2O		0	Pa								
Pitot coefficient(Cp):		0.831	Note: Use 1 if raw data corrected									
TEST ONE:											STP	
				Stack					Vol Flow		Vol Flow	Vol Flow
	Delta Hs (mm)	Pitot mm H_20	Pa	Temp, ℃	DGM in	DGM out	V(m/s)	m^3/s	V(m/s)		m^3/s	m^3/min
	52.3	5.5	37.2	20	10	10	6.6	4.2	6.1		3.9	233
	52.3	5.5	37.2	24	11	10						
	15.2	1.6	10.8	28	11	10						
	17.1	1.8	12.2	30	10	9		Vol Flow			Vol Flow	
	23.8	2.5	16.9	22	11	10		cfm			cfm	
	26.6	2.8	19.0	21	12	10						
	58.9	6.2	42.0	26	12	10		8834			8223	
	61.8	6.5	44.0	20	15	11						
		Mean	27	23.9		11						
		Std	13	3.6								
			Pa	Temp, ℃		DGM						
TEST TWO:												
Barometric Pressure (Pb):	mb	1025.5	102550	Pa								
Static Pressure (Ps):	"H_2O	0.138	34	Pa								
	mmH_2O		0	Pa								
Pitot coefficient(Cp):		0.831										
											STP	
								Vol Flow			Vol Flow	Vol Flow
	Delta Hs (mm)	Pitot mm H_20	Pa	Temp, ℃	DGM in	DGM out	V(m/s)	m^3/s	V(m/s)		m^3/s	m^3/min
	19.5	2.0	13.5	22	15	13	6.3	4.0	5.9		3.7	225
	21.5	2.2	14.9	25	15	14						
	58.6	6.0	40.6	24	14	14						
	58.6	6.0	40.6	31	15	14		Vol Flow			Vol Flow	
	50.8	5.2	35.2	23	14	14		cfm			cfm	
	50.8	5.2	35.2	22	15	14						
	17.6	1.8	12.2	22	16	13		8521			7938	
	17.6	1.8	12.2	21	15	14						
		Mean	26	24		14						
		Std	13	3.0								
			Pa	Temp, ℃		DGM						

PARTICULATES		Template Version 4 / Feb15 / TH										
Site: East Anglian Galv, Sawtry			Plant:	EAG 1, Galv Extraction				Date:	11-Apr-19			
	Units											
Stack diameter(Ds):	m	0.90	0.45									
Stack dimensions(Ds):	m	0.00	0.00									
Stack area(As):	m^2	0.636										
Standard 9096 or 13284:		13284										
Filter ID:		3346		3347		3348						
Filter Size (mm) 37, 47, 110 or 4:		47		47		47						
Filter type:		Quartz		Quartz		Quartz						
Filter Sampling temp:	℃	24		24								
Pre-sampling Conditoning temp	℃	180		180		180						
Post-sampling Conditioning temp:	℃	160		160		160						
Sample Ref:		EAG 1-1		EAG 1-2		EAG 1-B						
Filter weights:						Blank						
Tare Test One:		0.14403	*Tare Test Two:*	0.14503		0.14399						
Gross Test One:		0.14770	*Gross Test Two:*	0.14881		0.14419						
mass collected:		0.00368		0.00378		0.00020						
Wash Out Weights:						Blank						
Tare Test One:		46.54342	*Tare Test Two:*	58.93688		47.97072						
Gross Test One:		46.54402	*Gross Test Two:*	58.93766		47.97088						
mass collected:		0.0006		0.0008		0.0002						
Control Weights:		**Test 1**		**Test 2**		**Blank**						
Mass Change:	***Filter:***	-0.00004		-0.00004		-0.00004						
Mass Change:	***Beaker:***	0.00067		0.00067		0.00067						
			Test 1		**Test 2**							
DGM Cal factor(Yd):			1.0133		1.0133					**Mass Emission without blank correction**		
Avg Delta H(DH):	Pa		377		362							
Barometric pressure(Pba):	Pa		102500		102550							
Reference pressure(Pr):	Pa	101325								6.4	7.0	
Avg DGM temp(Tm):	K		283.8		287.3							
Reference temp (Tr):	K	273								Mass Emission		
Duct O2(Od):	%									Test One	Test Two	
Ref O2(Or):	%											
Moisture(Bws):	%		1.0		1.1					25	26	mg/s
Gas vol sampled(Vm):	m^3		0.58		0.57							
Gas vol corrected(Vc):	m^3		0.57		0.55					89	94	g/hr
Moles Dry Gas(Mdg):	M		26		25							
										716	755	g/8 hr day
Particulates collected, (Mass):	mg		3.7		3.9							
Concentration at STP dry(Cm):	mg/m^3		6.5	6.8	7.1					3.6	3.8	kg/5 day week
Concentration at STP wet(Cw):	mg/m^3		6.4	6.7	7.0							
Concentration at ref O2(C-O2):	mg/m^3		6.5		7.1					172	181	kg/48 week year
Minus Blank:	mg		3.5		3.7							
	mg/m^3		6.0	6.3	6.6							
	mg/m^3		6.0	6.3	6.6							
	mg/m^3		6.0		6.6							
							Blank Acceptable?					
Overall Test Blank	mg		0.24		0.24							
	mg/m^3		0.42		0.44		Yes	Yes				
	mg/m^3		0.42		0.43		Yes	Yes				
	mg/m^3		0.42		0.44		Yes	Yes				
Acceptability Limit	mg/m^3		<1.50		<1.50							
Acetone Blank	mg		0.00		0.00							
	mg/m^3		0.00		0.00							
	mg/m^3		0.00		0.00							
	mg/m^3		0.00		0.00							
Emission Limit:	mg/m^3	15										
Test Detection limit:												
Particulates collected, (Mass):	mg		0.29		0.29							
Concentration at STP dry(Cm):	mg/m^3		0.50		0.51							
Concentration at STP wet(Cw):	mg/m^3		0.49		0.51							
Concentration at ref O2(C-O2):	mg/m^3		0.50		0.51							
Impinger weights:	g	**Imp 1**										
Before Test One:		580.0										
After Test One:		584.7										
H2O collected:		4.7	*Moles H_2O:*	0.26								
		Imp 1										
Before Test Two:		584.7										
After Test Two:		589.8										
H2O collected:		5.1	*Moles H_2O:*	0.28								
Test DGM readings:	l											
Before Test One:		235.62	*Before Test Two:*	822.16	Metric Millenium Inst							
After Test One:		815.63	*After Test Two:*	1388.34	Meter							
Sampled vol :		580.01		566.18								
%Isokinetic		*Test One:*		*Test Two:*								
Nozzle Dia:	"	0.3103		0.3103								
Nozzle >8mm Dia?		No		No								
Sampl time / point	mins	8		8								
Sample Duration:	mins	32		32								
Theoretical vol @ STP:	m^3	0.571		0.552								
% Isokinetic:		101	In Range	102	In Range							
Number of traverses:		2		2								
Theoretical Number of Traverses:		2		2								
Theoretical Points / Traverse		2		2								
Acuual Points / Traverse		2		2								
Standard Uncertainty	+/-	0.46	mg/m3	0.48								
Expanded Uncertainty:	+/-	0.93	mg/m^3	0.97								
% of ELV		6.2		6.5								
Acceptable?		Yes		Yes								