

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: A2 / Form Dated 1st February 2006

Reporting of Emissions to Air for the period from 1st January 2016 to 31st December 2016

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
A1	Oxides of nitrogen as NO ₂	50mg/m ³ ^[6]	14.0	TGN M22	23/11/2016, 10:00-11:00	MCERTS / UKAS	± 7.5 mg/m ³
A2	Oxides of nitrogen as NO ₂	200mg/m ³ ^[7]	62.6	BS EN 14792	24/11/2016 12:05-13:05	MCERTS / UKAS	± 24 mg/m ³
A2	Carbon monoxide	200mg/m ³ ^[7]	3.9	BS EN 15058	24/11/2016 12:05-13:05	MCERTS / UKAS	± 11.6 mg/m ³
A3	Oxides of nitrogen as NO ₂	None	79.5 (b)	BS EN 14792	24/11/2016 11:13-11:15, 11:30-11:32, 11:53-11:54 hrs	MCERTS / UKAS	± 24 mg/m ³
A3	Carbon monoxide	None	21.3 (b)	BS EN 15058	24/11/2016 11:13-11:15, 11:30-11:32, 11:53-11:54 hrs	MCERTS / UKAS	± 12 mg/m ³
A13	Formaldehyde	100g/hr ^[6] ^[8]	7.36	BS EN 13649	25/11/2016 09:50-10:50, 10:55-11:55, 12:00-13:00 (A13 & A24)	MCERTS / UKAS	± 36% mg/m ³

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Note: Result [1] are average values of sample results (where indicated), being more representative, as agreed with NRW

[1b] Results of site's only operational boiler B (during the sampling period the boiler was only operating for 7 min as it is now typically only on standby but testing was referenced to 3% Oxygen as stated in the Permit).

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given.

[3] For non-continuous measurements the date and time of the sample that produced the result is given.

[4] The accreditation status of the equipment and/or the monitoring organisation, as appropriate, for the methods used for both sampling and analysis.

[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated. The basis of any other uncertainty figure needs to be stated. Where no figure is available NRW will need to agree an appropriate uncertainty value.

[6] Corrected to 273K, 101.3KPa.

[7] Corrected to 273K, 101.3KPa, 3% oxygen, dry.

[8] Combined mass emission from A13 and A24 emission point corrected 273K, 101.3KPa.

Signed

(authorised to sign as representative of Operator)

Date: 26th January 2017

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: R1 / Form Dated 1st February 2006

Reporting of Waste Disposal and Recovery for the year 2016 (01/01/16 – 31/12/16)

Waste Description	Disposal Route	Recovery	
		Tonnes	Tonnes
1) Hazardous Wastes			
Hazardous waste from production and maintenance activities	D09, D10, D15, R09, R13	99.7	4.7
Other hazardous wastes	N/A	N/A	
Total hazardous waste		99.7	
2) Non-Hazardous Wastes			
Non-Hazardous silica waste to landfill from production activities (including packaging)	D01	328.5	
Non-Hazardous waste from production and maintenance activities	D01, D14, D15, R01, R03, R09, R13	2.43	88.05
Non-Hazardous waste from construction activities (subsoil and hardcore)			169
Total Non-Hazardous waste		330.9	257.05
TOTAL WASTE		430.6	261.75

Trends in Waste Disposal and Recovery			
Year	Parameter	Total Waste	Waste per unit output
2006	Named Waste	317.5	Report on P11
2007	134.7	293.2	Report on P11
2008	249.0		
2009	456.2	464.7	Report on P11
2010	154.8	162.8	Report on P11
2011	199.5	199.5	Report on P11
2012	245.4	245.4	Report on P11
2013	165.65	165.65	Report on P11
2014	214.31	214.31	Report on P11
2015	242.50	242.50	Report on P11
2016	258.72	258.72	Report on P11
	430.6	430.6	Report on P11

Operator comments: Maintenance of interceptor pits on site (68MT contributed to Haz waste totals), Spoil from Treated Plant civil works. An increase on CY15 totals in landfill silica mainly due to old silica stock, end of shelf life silica and some packaging with residual silica (not 2016 production OQ). 40.5MT general waste incinerated (RDF) energy recovery

(Signature)

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Date 26th January 2017

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: WU1 / Form Dated 1st February 2006

Reporting of Water Usage for the year 2015 (01/01/16 – 31/12/16)

Water Source	Usage (m ³)	Specific Usage (m ³ /t)
Mains water	78,272	6.63
Dow Corning	32,911	2.79
TOTAL WATER USAGE	111,182	9.41

Year	Trends in Water Usage		
	Mains water	Dow Corning	Total water usage
2006	103,892	94,047	197,939
2007	92,671	87,424	180,096
2008	49,805	73,734	123,539
2009	52,229	47,656	99,885
2010	58,643	43,664	102,307
2011	73,172	44,154	117,326
2012	76,828	42,204	119,032
2013	76,004	49,040	125,044
2014	68,392	41,828	110,220
2015	74,320	38,023	112,343
2016	78,272	32,911	111,182

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Date 26th January 2017

Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: E1 / Form Dated 1st February 2006

Reporting of Energy Usage for the year 2015 (01/01/16 – 31/12/16)

Energy Source	Energy Usage		CO ₂ Produced (Tonnes)
	Quantity	Primary Energy (MWh)	
Electricity	MWh	40,470	6718
Natural Gas	MWh	45437	8633
TOTAL		85,907	15,351

* Conversion factor for delivered electricity to primary energy = 2.4

** Conversion factor for Electricity CO₂ equivalent metric tonnes = MWh x 0.166

*** Conversion factor for Gas CO₂ equivalent metric tonnes = MWh x 0.190

Operator comments:

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Signed

(authorised to sign as representative of the Operator)

Date 26th January 2017

Year	Trends in Energy Usage		
	Primary Energy usage	CO ₂ produced	CO ₂ per unit output
2006	108,936	19,884	Report on PI1
2007	107,011	19,531	Report on PI1
2008	99,904	18,219	Report on PI1
2009	95,570	17,445	Report on PI1
2010	99,165	18,055	Report on PI1
2011	97,179	17,681	Report on PI1
2012	93,540	17,004	Report on PI1
2013	84,074	15,040	Report on PI1
2014	85,449	15,306	Report on PI1
2015	86,454	15,480	Report on PI1
2016	85,907	15,351	Report on PI1

Operator: Cabot Carbon Limited

Form Number: PI1 / Form Dated 1st February 2006

Reporting of Performance Indicators for the year 2015 (01/01/16 – 31/12/16)

	Annual Production/Treatment
Production of fumed silica	11812 tonnes

Environmental Performance Indicators

Parameter	Annual Average	Units
Carbon monoxide	22.90	kg/tonne
Water use	9.41	m ³ /tonne
Energy use	7,273	kWh/tonne
Carbon dioxide	0.73	tonne/tonne
Waste silica to landfill	27.5	kg/tonne
Chlorosilane	2.50	tonne/tonne
Hydrogen	583.3	Nm ³ /tonne

Trends in Environmental Performance							
Year	Parameter						
	CO	Water	Energy	CO ₂	Waste silica	Chloro-silane	H ₂
	kg/t	m ³ /t	kWh/t	t/t	kg/t	t/t	Nm ³ /t
2006	22.75	17.3	9,500	1.5523	4.16	2.65	580.14
2007	25.26	15.8	9,390	1.2285	8.31	2.57	571.87
2008	29.05	13.2	10,670	1.3855	8.30	2.73	694.81
2009	30.61	11.3	10,817	1.3790	4.87	2.60	766.64
2010	40.41	10.2	9,900	1.2640	7.56	2.59	604.20
2012	37.28	13.2	10,356	1.2990	8.63	2.83	628.90
2013	21.31	10.80	7,262	0.7401	11.89	2.41	575.30
2014	21.69	9.04	7,011	0.7282	17.06	2.51	503.51
2015	20.63	8.98	6,910	0.7143	14.13	2.53	579.39
2016	22.90	9.41	7,273	0.7309	27.5	2.50	583.30

Operator's comments: CO2 based on natural gas consumption only. Increase in silica to Landfill due to old stock/out of shelf life date.

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Date 26th January 2017

