Hydro Aluminium Deeside

Environmental Permit No. BK3638IF

2016 Performance Report

January 2017

Contents

1. Introduction

1.1 Condition 4.2.2 of the Environmental Permit for Hydro Aluminium Deeside requires a report on the performance of our activities over the previous year.

1.2 As required by condition 4.2.2, the following sections detail:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit, including an interpretive review of that data;

(b) the annual production / treatment data set out in Schedule 5, Table S5.2; and

(c) the performance parameters set out in Schedule 5, Table S5.3 using the forms specified in Table S5.4 of that Schedule.

1.3 There were no major breakdowns, modifications to the process or variations to the Permit in 2016. The installation operated at a level marginally (approximately 5%) below full capacity in order to meet market demand. The automated homogeniser, saw and packing line installed in 2014 was fully operational throughout 2016.

2. Emissions to Air

2.1 Particulate emissions to air from points A1, A12 and A13 are monitored using a PCME model DT780 continuous emissions monitor (an MCERTS-certified CEM). The results of continuous monitoring have been reported each quarter to Natural Resources Wales using permit reporting form Air1a.

2.2 Proprietary "Dust Monitor" software enables analysis of the data collected by the CEM. The maximum readings from 2016 for each emission point are detailed in the table below.

Table 2.1. Summary of PCME monitoring results for 2016

Emission Point	Limit	Max daily average in 2016
A1	10 mg/m^3 daily average	5.98 mg/m^3 (03/01/16)
A12	10 mg/m^3 daily average	0.32 mg/m^3 (12/06/16)
A13	10 mg/m^3 daily average	0.55 mg/m^3 (08/11/16)

Emission Point	Limit	Max result, average of daily average values
A1	5 mg/m^3 monthly average	0.74 mg/m^3 (September)
A12	5 mg/m^3 monthly average	0.22 mg/m^3 (June)
A13	No limit set	0.22 mg/m^3 (February)

2.3 No breaches of the emission limits for particulates were recorded in 2016.

2.4 Operational procedures have been reviewed and are deemed satisfactory to ensure continued data collection and analysis (site procedure OPL2905), and investigation of equipment alarms that may indicate a fault or limit breach (site procedure OPL2103). Alarms on the CEM are set at 3 mg/m^3 and 4.75 mg/m^3 to ensure that action is taken if the emission limit value of 5 mg/m^3 (monthly average limit) is in danger of being breached. Internal audits include checks that PCME alarms are being reported and acted upon.

2.5 Extractive sampling of particulates was undertaken between 27th and 29th June 2016 by Environmental Scientifics Group Ltd (MCERTS accredited) to enable calibration of the CEM. Servicing and calibration of the PCME Dust Monitor was also completed by ESG.

2.6 The Environmental Permit for the site requires twice-yearly extractive monitoring of stacks A1 and A12, and annual extractive monitoring of stack A13. All three stacks were tested between 27th June and 1st July by ESG (job no. LNO 13057). A1 and A12 were tested again by ESG on 31st October – 1st November (job no. LNO 13271).

2.7 The results of extractive monitoring have been reported to Natural Resources Wales using permit reporting forms Air1b, Air1c and Air1d. Analysis of these results shows that all results are below the emission limit values detailed in the permit, for both sampling exercises conducted in 2016.

3. Emissions to Water

3.1 Emissions to water from discharge point W1 are monitored whenever the contents of the Casting Pit are discharged. In 2016 this occurred in August and December. The results of this monitoring are summarised below.

Table 3.1. Summary of W1 monitoring results

Parameter	ELV	09/08/16	19/12/16	Average
BOD (mg/l)	10	<1	2.19	1.59
Suspended solids (mg/l)	35	<2	<2	<2
COD (mg/l)	125	15.9	9.43	12.67
Ammoniacal nitrogen (mg/l)	5	<0.2	<0.2	<0.2
Aluminium (mg/l)	0.5	0.02	0.03	0.025
Total hydrocarbon oil (mg/l)	2	<0.05	<0.05	<0.05
pH	6 – 9	7.36	7.86	7.61
Temperature (°C)	25	17	10	15.7
Flow (l/sec)	No limit	-	-	-

Notes:

- Flow rate at release point W1 is not measured, following the removal of the v-notch weir during installation of a penstock valve at W1. Agreed with EA that water emission volumes can be calculated from cooling water bleed-off and casting pit emptying (see EA Compliance Assessment Report no. I/110329/BK3638).

3.2 These results show that all releases are within the permitted limits, with some results being below the limit of detection in some cases (indicated by a "<" symbol in the table).

4. Environmental Noise

4.1 No complaints were received in 2016 regarding noise from site activities. An environmental noise survey was conducted on 30th June and 5th July 2016. Results from this are as follows, with the results from previous surveys included for comparison.

Table 4.1. Noise survey results

	Day, dB(A)						Night, dB(A)					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Measured noise (Factory operating)	46	49	47	48	49	49	46	43	42	46	43	42
Residual noise (Factory not operating)	45	44	46	46	47	48	43	39	36	42	38	37
Specific noise at nearest property	38	46	39	43	44	41	42	40	40	39	40	39
Background noise (L_{90})	42	39	43	42	42	43	41	38	35	41	35	35

4.2 The results of the 2016 noise survey indicate that the likelihood of complaints, during both the day and night time, would be of marginal significance at the nearest residential property on The Oval. This is an improved result on the 2015 survey, which indicated that complaints were "likely" in both the daytime and night time. The site has not received a noise complaint since 02/07/2013.

4.3 Noise reduction measures continue to be applied. The automated laydown station (where aluminium logs are placed after their removal from the casting pit) has removed the chiming created by rolling logs by hand along the old laydown station. The automated laydown station has also enabled the "turning frame" to be removed (this turned logs in the air through 90 degrees between the casting pit and the old laydown station), in turn removing the chiming noise created by logs hitting the frame and colliding with each other. The "anti-twist device" remains in use on the load hook of the overhead crane used to remove logs from the casting pit, helping to reduce chiming during the transfer from Caster to Laydown. Noise from sawing operations continues to be minimised, with sawing of logs and discharge of butt ends taking place within an acoustic enclosure. Cut logs are picked-up and carried by automated equipment to the packing area, in contrast to the old saw where logs rolled under gravity to a manual banding station. Preventative maintenance includes condition monitoring on all fans, including those serving the automated homogeniser and air cooling station. "White noise" reversing alarms are in use on all site vehicles to further reduce tonal noise emanating from on-site activities.

5. Operational Performance

5.1 Annual production data required by Table S5.2 is as follows.

Secondary aluminium produced	56,347 tonnes

5.2 Additional performance parameters are reported using permit reporting forms WaterUsage1, Energy1 and Performance1. These are included below.

Permit Number: EA/EPR/BK3638IF/V002 Operator: Hydro Aluminium Limited

Facility: Wrexham Aluminium Works **Form Number: WaterUsage1**

Reporting of Water Usage for the year 2016

Water Source	Usage (m^3/year	Specific Usage (m^3/unit output)
Mains water	31,469 m^3	0.56 m^3 per tonne of aluminium produced
TOTAL WATER USAGE	31,469 m^3	0.56 m^3 per tonne of aluminium produced

Operator's comments :

Slight increase in water consumption of 0.03 m^3 per tonne of aluminium produced compared to 2015. This is attributed to the increased production levels, up 3607 tonnes from 2015. As more logs are being cast, more cooling water is used resulting in increased evaporation at the casting pit and increased evaporative loss from the cooling tower.

Signed …….Joel Priest……. Date……12/01/17……..
(authorised to sign as representative of Operator)

Permit Number: EA/EPR/BK3638IF/V002 Operator: Hydro Aluminium Limited

Facility: Wrexham Aluminium Works **Form Number: Energy1**

Reporting of Energy Usage for the year 2016

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	Specific Usage (MWh/unit output)
Electricity *	7129.7 MWh (cf 6,638.5 in 2015)	18537.2 MWh	0.329 MWh per tonne of aluminium produced (cf 0.327 in 2015)
Natural Gas	66,936.82 MWh (cf 62,044.31 in 2015)		1.188 MWh per tonne of aluminium produced (cf 1.176 in 2015)
TOTAL	-	85474.02 MWh (cf 79304.41 MWh in 2015)	1.517 MWh per tonne of aluminium produced (cf 1.503 in 2015)

* Conversion factor for delivered electricity to primary energy = 2.6

Operator's comments:
7.4% increase in total electricity use which translates to 0.6% increase in electricity use per tonne of product, and 7.9% increase in total gas use translating to a 1% increase in gas consumption per tonne compared to 2015. Overall specific usage has increased by 0.9% compared to 2015, but is 7.5% lower than 2014 energy consumption. There will be increased focus on energy monitoring and control from 2017 onwards through the operation of an ISO 50001-compliant energy management system.

Signed …… Joel Priest ……. Date……12/01/17……..
(Authorised to sign as representative of Operator)

Permit Number: EA/EPR/BK3638IF/V002 Operator: Hydro Aluminium Limited

Facility: Wrexham Aluminium Works Form Number: Performance1

Reporting of other performance indicators for the period 01/01/2016 to 31/12/2016

Parameter	Tonne	Tonne / Tonne Product
Total raw material used (tonnes of primary aluminium)	13,436 (15,565 in 2015)	0.24 (0.30 in 2015)
Dross and skimmings, used filters and swarf produced	2,725 (2,595 in 2015)	0.048 (0.049 in 2015)
Bag plant residues and waste lime	100.02	0.002

Operator's comments :
Total prime use has decreased by 13.7% compared to 2015, and by 20% per tonne produced due to effective scrap purchasing strategy in 2016 and a drive to make alloys with higher recycled metal content.
Total dross production has increased slightly, but is 2% lower per tonne produced compared to 2015.
Lime consumption has reduced by 5 tonnes despite producing 3607 tonnes more in 2016.

Signed …… Joel Priest …….. Date……12/01/17……..
(Authorised to sign as representative of Operator)