



Date: 31<sup>st</sup> January 2024

Mr Tony Leakey  
Natural Resources Wales  
Rivers House  
St Mellons  
Cardiff  
CF3 0EY

Dear Mr Leakey

**Re: Permit Number EPR/BS6149IQ Monitoring Returns**

Please find enclosed a performance report for 2023 in accordance with Condition 4.2.2 of the Permit.

Should you have any queries please do not hesitate to contact us.

Yours sincerely,

[Redacted signature]

**Environmental Manager**

[Redacted name]

- 4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:
- (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 4 Table S4.2
  - (c) the performance parameters set out in Schedule 4 Table S4.3 using the forms specified in table S4.4 of that Schedule

- (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

## Emissions to Air

### (i) Continuous Measurements (A1, A2, A19)

ROCKWOOL replaced the existing in-house CEM spreadsheet data handling system with an MCERTS data acquisition and handling system (DAHS) during Q1 2023. The Olicem "ReportLoq" DAHS was in use for reporting purposes from Q2 2023. The DAHS meets the requirements of the standard EN 17255.

#### Line 1 Cupola (A1)

Line 1 cupola (emission point A1) was operational for only 8 days in 2023.

Parameter	Line 1 Operational Days	No. of exceedances	% in Compliance
Particulate Matter	8	0	100
Oxides of Nitrogen (NOx)	8	0	100
Sulphur Dioxide (SO <sub>2</sub> )	8	0	100
Carbon Monoxide (CO)	8	0	100

The cupola was used for limited operation in October and November. Emissions of nitrogen oxides, sulphur dioxide, carbon monoxide and particulate matter were within limits throughout the operational time.

#### Line 2 Cupola (A2)

Line 2 cupola (emission point A2) was operational on 287 days in 2023.

Parameter	Line 2 Operational Days	No. of exceedances	% in Compliance
Particulate Matter	287	5	98.3
Nitrogen Oxides	287	4	98.6
Sulphur Dioxide	287	0	100
Carbon Monoxide	287	1	99.7

Emissions of nitrogen oxides, sulphur dioxide, carbon monoxide and particulate matter were within limits throughout this time other than the occasions described below. Note of the 10 exceedances listed, 9 were determined invalid due to start-up or shut-down periods while 1 resulted in a Schedule 5 Notification.

- The Particulate Matter result was 15.4mg/Nm<sup>3</sup> and the NOx result was 545.4mg/Nm<sup>3</sup> on the 11<sup>th</sup> April 2023. Line 2 Cupola restarted at approximately 17:00 on 11<sup>th</sup> April following a week long shutdown. Both the Particulates and NOx readings were high following the initial start-up of the combustion system. There were several process stops due to high temperature. **There are only 13 half hourly valid averages for the relevant 24 hour period for each parameter. The daily average values for both parameters are therefore invalid as it included a start-up period.**
- The NOx result was 522.5mg/Nm<sup>3</sup> and the CO result was 109.1mg/Nm<sup>3</sup> on the 12<sup>th</sup> April 2023. Line 2 Cupola restarted at approximately 05:30 on 12<sup>th</sup> April following an unscheduled production stop. NOx and CO readings were high on initial start-up but the line was then shutdown again at approximately

08:30 to resolve a temperature probe fault. The Line restarted at approximately 13:00 and the combustion system was initially unstable providing erratic readings and high NOx and CO. **There are only 28 half hourly valid averages for the relevant 24 hour period for each parameter. The daily average values for both parameters are therefore invalid as it included a start-up period.**

- The NOx result was 525.0mg/Nm<sup>3</sup> on the 14<sup>th</sup> April 2023. Line 2 Cupola stopped at approximately 02:40 on 14<sup>th</sup> April due to a pilot burner trip. NOx readings were high on starting back up leading to NOx analyser checks with supplier but the stack temperature remained unstable. The line was stopped at 23:00 to allow the shift time to carry out further inspections of the combustion system dampers due to NOx levels rising again at 21:00pm. **There are only 42 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a shut-down period.**
- **The NOx result was 505.5mg/Nm<sup>3</sup> on the 8<sup>th</sup> May 2023, a 24 hour average and permit exceedance resulting in a Schedule 5 notification.** At the beginning of the 24 hour average a CO spike caused high temperatures and TC17 (fresh air damper) to open. TC17 was stuck open and the environmental readings, including NOx, spiked. TC17 was inspected by the maintenance team and cleaned on 15<sup>th</sup> May and this improved performance. A whole new damper was fitted on the next down day and TC17 valve inspections are scheduled during every planned shutdown.
- The Particulate Matter result was 12.3mg/Nm<sup>3</sup> on 22<sup>nd</sup> June 2023. High dust levels were noted between 04:00 and 08:00. The Production Team could not identify any issues in the process. The probe was inspected and cleaned at 08:00 and the readings returned to within permitted limits at 08:30. High dust readings occurred again at 19:30 so production was stopped to allow further more detailed inspection and cleaning of the dust probe. **There were only 41 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a shut-down period**
- The Particulate Matter result was 12.2mg/Nm<sup>3</sup> on 25<sup>th</sup> September 2023. Production started back up at 14:00 after a week long shutdown. Dust readings were initially high on start-up but settled to below permitted limits. However, an unscheduled stop occurred between 18:30 and 19:30, and then again at 23:00. **There were only 14 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a start-up period.**
- The Particulate Matter result was 10.9mg/Nm<sup>3</sup> on 23<sup>rd</sup> October 2023. Production stopped for a planned shutdown from 04:00 on 21<sup>st</sup> October to 15:30 on 23<sup>rd</sup> October. A series of particulate spikes occurred during the start-up. This was an abnormal situation but the particulate levels returned to below permit levels at 17:30 and continued to drop for the remainder of the 24 hours. **There were only 17 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a start-up period.**
- The Particulate Matter result was 22.5mg/Nm<sup>3</sup> on 6<sup>th</sup> November 2023. Production re-started at 15:00 on 6<sup>th</sup> November after a weekend shutdown. The particulate levels spiked and on inspection the control unit recommended “clean sensor”. The sensor was put into maintenance mode at 18:00, cleaned and inspected. During the inspection a loose connection was found and the readings stopped displaying on our Data Acquisition Handling System (DAHS). A shift electrician resolved the issue and particulate readings returned on the DAHS at 21:00. The particulate readings were well below the permit limit for the remainder of the 24 hours. **There were only 13 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a start-up period.**

### Line 3 Cupola (A19)

Line 3 cupola (emission point A19) was operational on 316 days in 2023.

Parameter	Line 3 Operational Days	No. of exceedances	% in Compliance
Particulate Matter	316	4	98.6
Nitrogen Oxides	316	0	100
Sulphur Dioxide	316	1	99.7
Carbon Monoxide	316	7	97.6

Emissions of nitrogen oxides, sulphur dioxide, carbon monoxide and particulate matter were within limits throughout this time other than the occasions described below. Note of the 11 exceedances listed, 8 were determined invalid due to start-up or shut-down periods while 3 resulted in a Schedule 5 Notification.

- The Particulate Matter result was 11.5, 11.4 and 11.3mg/Nm<sup>3</sup> on the 22<sup>nd</sup>, 25<sup>th</sup> and 26<sup>th</sup> April respectively. Process shutdown to inspect fly ash bags on 26<sup>th</sup> April. Dust found and bags being replaced prior to process re-starting. **There were 43, 41 and 40 half hourly valid averages**

respectively for the relevant 24 hour period. The daily average value is therefore invalid as it included a shut-down period.

- The CO result was 77.2mg/Nm<sup>3</sup> on the 11<sup>th</sup> May 2023. Line 3 Cupola had a scheduled 12 hour down day on 11<sup>th</sup> May but the start was delayed until 19:30. There was a CO spike prior to the down day at 03:30 and then again on start-up at 19:30 during the same 24 hour period. **There were only 15 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a start-up period.**
- **The CO result was 77.2mg/Nm<sup>3</sup> and the Particulate Matter result 10.7mg/Nm<sup>3</sup> on the 4<sup>th</sup> June 2023, a 24 hour average and permit exceedance for both parameters resulting in a Schedule 5 notification.** A failure of the fly ash bags occurred sometime after the Easter shutdown and led to large CO spikes and Particulate Matter exceedance scheduled line down day was moved forward to 6<sup>th</sup> June and extended to 48 hours to allow an inspection of the fly ash bags and combustion system.
- The CO result was 63.6mg/Nm<sup>3</sup> on the 1<sup>st</sup> July 2023. CO spikes occurred between 01:00 and 09:30 and then again at 19:30 to 20:30. Production was stopped at 21:00 to identify the cause of the CO instability. Contaminated heat exchangers from previous fly ash breakthrough identified as possible source of CO instability. Please note that the heat exchangers were visually inspected as part of the previous incident and no obvious issues were found. The scheduled line down day was moved forward to 3<sup>rd</sup> July and extended to 48 hours to allow full inspection and cleaning of the heat exchangers. **There are only 42 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a shut-down period**
- **The CO result was 51.1mg/Nm<sup>3</sup> on the 2<sup>nd</sup> July 2023, a 24 hour average and permit exceedance resulting in a Schedule 5 notification.** CO instability was monitored by the Operators and levels were within permit limits for the majority of the 24 hour period. However, a burner in the combustion system went out towards the end of the 24 hour period and pushed the CO average above permit limits. Contaminated heat exchangers from previous fly ash breakthrough identified as possible source of CO instability. Please note that the heat exchangers were visually inspected as part of the previous incident and no obvious issues were found. The scheduled line down day was moved forward to 3<sup>rd</sup> July and extended to 48 hours to allow full inspection and cleaning of the heat exchangers.
- The CO result was 89.4mg/Nm<sup>3</sup> on the 3<sup>rd</sup> July 2023. CO spikes occurred between midnight and 00:30, and again at 09:00 and 09:30. Production was planned to stop early to allow inspections to take place. Melting stopped at 10:30. Contaminated heat exchangers from previous fly ash breakthrough identified as possible source of CO instability. Please note that the heat exchangers were visually inspected as part of the previous incident and no obvious issues were found. The scheduled line down day was moved forward to 3<sup>rd</sup> July and extended to 48 hours to allow full inspection and cleaning of the heat exchangers. **There are only 21 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a shut-down period.**
- The CO result was 90.3mg/Nm<sup>3</sup> on the 14<sup>th</sup> July 2023. CO spikes occurred between 07:00 and 08:30 but settled back within permitted limits. However, a second CO spike occurred at 18:00 and the readings remained high. Production was stopped at 19:00 to allow investigations to take place as production output was decreasing. Following the investigation, a decision was taken to drop the contents of the Cupola. It was established that insufficient coke had reached the Cupola, which led to ineffective melting of the raw materials. This was an abnormal situation and the accepted resolution method is to drop all contents, re-brick and start a new campaign. Production ceased for 30 hours, recommencing at 01:00 on Sunday 16<sup>th</sup> July. **There are only 34 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a shut-down period.**
- The CO result was 70.3mg/Nm<sup>3</sup> and the SO<sub>2</sub> result 1,598.6mg/Nm<sup>3</sup> on the 22<sup>nd</sup> October 2023. Production had stopped for the majority of the day for maintenance. A large CO spike occurred due to low temperature in the Cupola after the line re-started at 17:30. This was an abnormal situation on start-up and the CO levels returned to below permit levels at 18:00 and continued to drop for the remainder of the 24 hours. Unfortunately, during the stop an electrical issue occurred with the desulphurisation plant. This resulted in higher SO<sub>2</sub> after production resumed at 17:30. The shift electrician resolved the issue and SO<sub>2</sub> levels returned to below permit levels at 01:30 the following day. **There are only 21 half hourly valid averages for the relevant 24 hour period. The daily average value is therefore invalid as it included a start-up period.**

### **(ii) Periodic Measurements**

Periodic measurements are carried out by an external laboratory with MCERTS and ISO 17025 accreditation. A total of 199 triplicate tests (597 individual tests) must be carried out in a year.

A summary of 2023's performance is shown below (completed tests alongside the required tests in brackets):

<b>Source (Emission Point)</b>	<b>No. Triplicate Tests</b>	<b>No. Exceedances</b>	<b>Details of Exceedances</b>
Cupolas (A1, A2, A19)	14 (21)	0	
Spinning Chambers (A3, A4, A21)	24 (36)	0	
Curing Ovens (A5, A6, A22)	42 (42)	0	
Cooling Zones (A7, A8, A23)	36 (36)	0	
Pipe Section Machines (A12, A13a, A13b, A13c, A14)	30 (40)	0	
Dust Filters (A9, A10, A11, A18, A24)	8 (8)	0	
Cement Briquette Plant (A25)	6 (6)	0	

NB – 160 triplicate tests (480 individual tests) were undertaken in 2023:

- Line 1 Cupola (A1) and Line 1 Spinning Chamber (A3) did not operate in the first half of the year and only operated for 8 days in the second half of the year. As a result, periodic testing could not be carried out for these sources in 2023.
- RSM1 (A13a) and RSM2 (A13b) were not tested in the Biannual 2 air emissions survey due to a shutdown in September and October and then limited operation in November and December 2023.
- RSM3 (A13c) was decommissioned in 2021 and therefore not tested in 2023. A13c was removed from the permit in Q3 2023 following the most recent variation EPR/BS6149IQ/V011.

All other emission points were tested as per the requirements of the Permit.

### **(iii) Impact Monitoring**

ROCKWOOL continues to monitor the ambient sulphur dioxide values in the local area by 2 different means; diffusion tubes and a continuous monitor. The continuous monitor is located in Soar Chapel, downwind of the prevailing westerly wind. The diffusion tubes are located within a 2km radius in all directions from the factory.

Both methods typically show values of less than 10µg/m<sup>3</sup>, which is below the sulphur dioxide annual mean of 20µg/m<sup>3</sup> in the Air Quality Strategy Volume 1 for the UK for the protection of vegetation and ecosystems (24 hour mean of 125µg/m<sup>3</sup> for protection of human health).

The data is sent to Bridgend County Borough Council on an annual basis and is also presented to residents at regular meetings.

Following a period of time where we weren't able to invite neighbours to site due to Covid restrictions, we were pleased this year to be able to hold two community meetings, in June and November, welcoming local councillors and residents to site and sharing more about what we do at ROCKWOOL UK. As well as providing an opportunity to meet our new Managing Director, the events featured a refreshed format designed to share more about the business and support constructive conversations. These were very positive sessions with lots of great input from the 30+ people who attended each one.



**(iii) Impact Monitoring**

One Freshwater Invertebrate Study measuring the quality of the stream that emission points W1 and W2 discharge into was carried out by an external consultant in August 2023. This was carried out after the discharge to stream via the overflow at W1.

Conclusion from August sampling report, issued September 2023, as follows:

“The data indicates that no deleterious effect has occurred to the watercourse between the upstream and downstream sampling points. Infrequent (rare) discharges of surface water that have passed through settlement tanks before entry into the Nant Ton-y-Groes are not considered to be significant.”

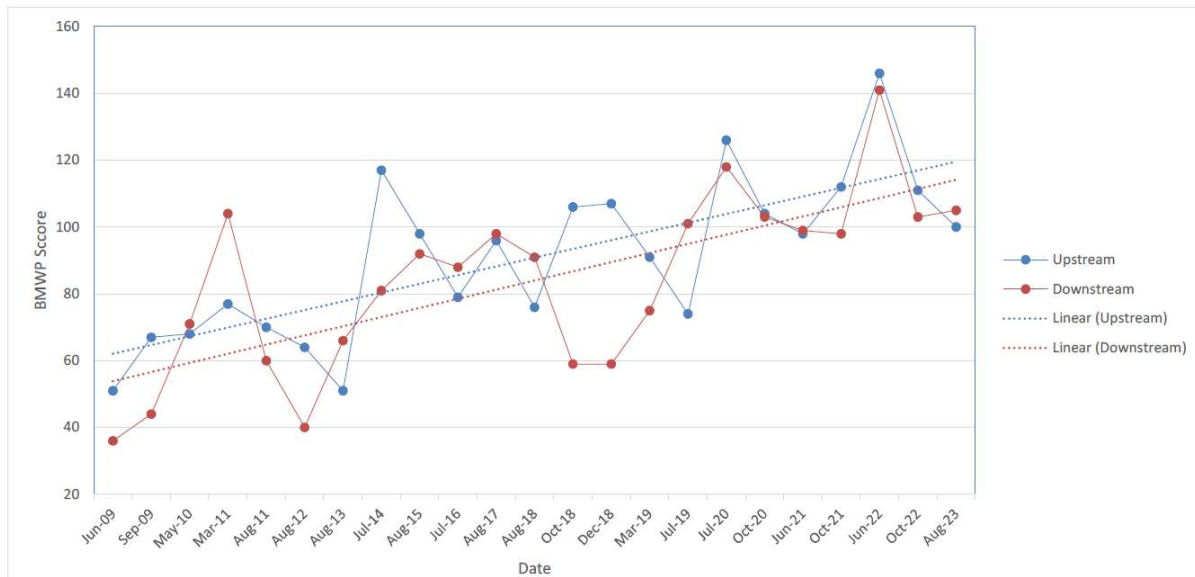
The report also discussed the data trends as follows:

“Combined BMWP data over the last 14 years continues to show an increasing positive trend despite much fluctuation (see Figure 2). The data indicates two significant falls in downstream scores around 2012/13 and in 2018 but no other occurrences of this type have been observed.”

“This provides continued confidence that the management of discharges to the watercourse from the Rockwool site is effective and that where discharges have occurred, these have not had a measurable impact on biological water quality.”

Figure 2 provided below:

Figure 2: Comparison of Combined Upstream and Combined Downstream Outflow BMWP scores June 2009 – August 2023.

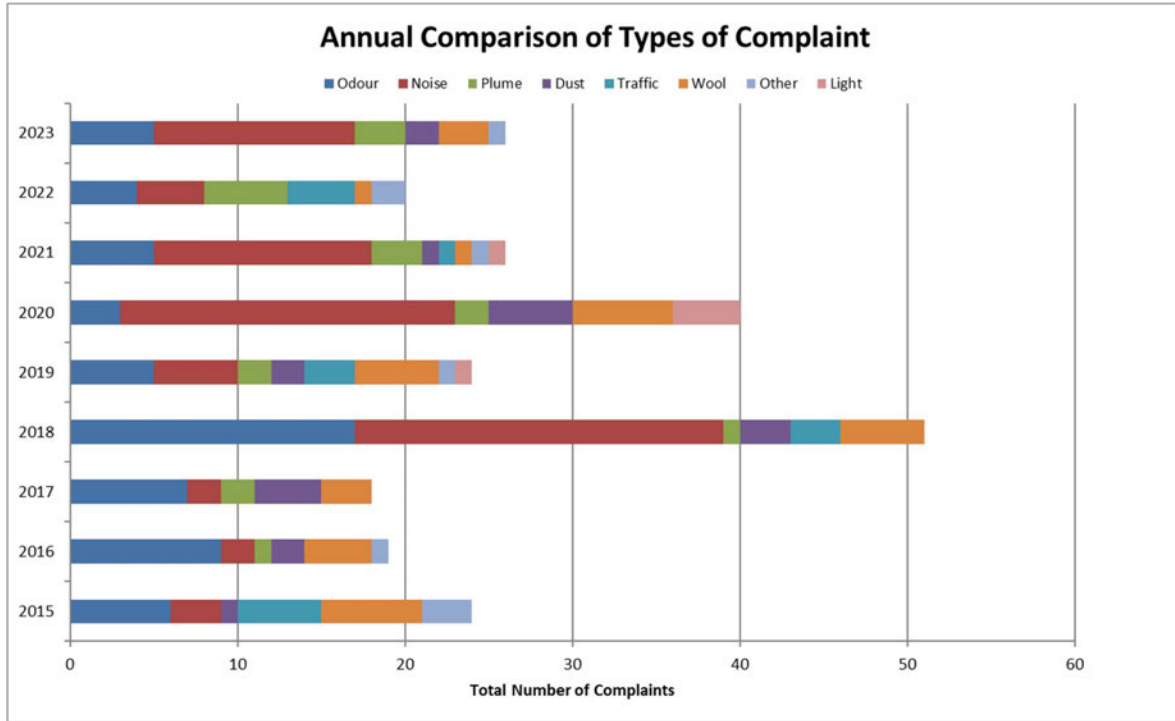


As a best practice going forward an annual Freshwater Invertebrate Study will be carried out, even if there are no discharges to stream.

# Environmental Complaints

The total number of complaints received in 2023 increased to 26 compared to 20 in 2022 but comparable to previous years and much lower than 2020 and 2018.

See the annual comparison graph for complaints below:



The majority of the complaints received in 2023 referenced noise (12) and odour (5).

Noise monitors have been purchased to continuously monitor noise levels at the site boundary. These have been installed at the West and East of the site and are used when investigating noise complaints to identify the sources.

An internal odour survey has been carried out to help identify the main sources of odour on site and has been communicated to our Process team to help reduce odour nuisance going forward.

All complaints are registered on an internal RockSHE system which aims to identify the root cause and allows the user to assign corrective actions. This is monitored by both ROCKWOOL Limited and our parent company ROCKWOOL Group.

## Energy, Water & Waste

In 2023, ROCKWOOL Ltd maintained certification to ISO 14001 and ISO 50001.

Sustainability goals are a priority for ROCKWOOL, with monthly energy analysis (gas, electricity and CO<sub>2</sub>) and an associated internal report helping maintain the focus on these key areas.

Electricity consumption decreased in 2023 compared to 2022. Electricity efficiency across all lines did not improve on the previous year due to an increased number of lines stops and less production.

Gas consumption decreased in 2023 compared to 2022. Gas efficiency across all lines did not improve on the previous year due to an increased number of lines stops and less production.

Coke consumption and efficiency were lower than 2022 due to a less production and a change of supplier.

Site total CO<sub>2</sub> emissions decreased in 2023 compared to 2022 due to less production but also due to energy efficiency drives such as improved burner maintenance to reduce gas consumption.

All energy efficiencies will continue to be monitored over the course of 2024 through weekly meter reads and monthly reports.

Water used in the process is supplemented where possible by rainfall, so mains water use remains as low as possible. There is also a dedicated process water storage room on site to store more water for reuse within the process. In 2023 our public water consumption decreased compared to the usage in 2022, and the water efficiency also improved, possibly due to the commissioning of the ORC heat recovery and use of rain water for dust suppression.

The only waste stream on site that went to landfill in 2023 is conveyor belts but this ceased in Q2 2023. Conveyor belts are now sent for incineration at an energy from waste plant.

The “RockCycle” recycling scheme accepted 1,873 tonnes of stone wool from external sources (waste product and off-cuts) for on-site processing and recycling in 2023. This tonnage increased from the previous year, due to an increase in returns from customers. All wool returned to site is milled and then mixed with other materials to form a cement briquette. Cement briquettes are then melted with basalt and slag in the cupola to form completely new stone wool products. None of the returned wool is landfilled – it is all used to create new products. This is an offering which is highly rated by our customers as it assists them with their waste management plans. In addition, 1,594 tonnes of stone wool was included in the internal recycle of ROCKWOOL products.

The ROCKWOOL Group has established Sustainability Goals covering energy (CO<sub>2</sub>), water and waste that apply to the global company with target date of 2030. Additionally, Group have supplemented existing sustainability targets with a decarbonisation goal that has been approved by the Science Based Targets initiative (SBTi). ROCKWOOL UK has aligned its targets accordingly.

The Environmental Team held an “Environment Day” in September 2023 for all main office staff. The day discussed the ISO 14001 and ISO 50001 policies and provided an overview of the environmental teams duties such as air, water, energy and waste. The main message to all attendees is that all workers (Employees and Contractors) must work in a way that does not impact the environment or affect energy consumption, but also bring to the attention of management anything that could potentially effect these. The day was a great success and received positive feedback. A factory based version is planned for March 2024.

**(b) the annual production/treatment data set out in Schedule 4 Table S4.2**

In 2023, ROCKWOOL produced 129,311 tonnes of mineral wool (as “NORM WOOL”)

**(c) the performance parameters set out in Schedule 4 Table S4.3 using the forms specified in table S4.4 of that Schedule**

The appropriate annual forms for water usage, energy usage, waste produced and recycled ROCKWOOL were sent to NRW on 26<sup>th</sup> January 2023.