



Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number:	IE-GHG145-10416-2
Operator:	CRH Plc 42 Fitzwilliam Square Dublin 2 D02 R279
Installation Name:	Clogrennane Lime Limited (Toonagh Lime Works)
Site Name:	Clogrennane Lime Limited (Toonagh Lime Works)
Location:	Ballybrody Ennis County Clare V95 E431 Ireland

Introductory Note

This introductory note does not form a part of the Greenhouse Gas Emissions Permit.

This Greenhouse Gas Emissions Permit authorises the holder to undertake named activities resulting in emissions of Carbon Dioxide from the listed emission sources. It also contains requirements that must be met in respect of such emissions, including monitoring and reporting requirements. This Greenhouse Gas Emissions Permit places an obligation on the Operator to surrender allowances to the Agency equal to the annual reportable emissions of carbon dioxide equivalent from the installation in each calendar year, no later than four months after the end of each such year.

Contact with Agency:

If you contact the Agency about this Greenhouse Gas Emissions Permit please quote the following reference: Greenhouse Gas Emissions Permit N^o IE-GHG145-10416.

All correspondence in relation to this permit should be addressed to:

Email: help.ets@epa.ie

By Post: Climate Change Unit, Environmental Protection Agency
P.O. Box 3000, Johnstown Castle Estate,
Co. Wexford

Updating of the permit:

This Greenhouse Gas Emissions Permit may be updated by the Agency, subject to compliance with Condition 2. The current Greenhouse Gas Emissions Permit will normally be available on the Agency's website at www.epa.ie and [ETSWAP](#).

Surrender of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially surrendered, a written application must be made to the on-line ETS portal, and written permission received from, the Agency through [ETSWAP](#).

Transfer of the permit or part of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially transferred to another Operator a joint written application to transfer this Greenhouse Gas Emissions Permit must be made (by both the existing and proposed Operators) to, and written permission received from, the Agency through the on-line ETS portal [ETSWAP](#).

Licence held pursuant to the Environmental Protection Agency Act 1992, as amended. (as of the date of this permit):

IPC/IE Licence Register Number
P0771-02

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG145-10416-2	30 June 2014	08 February 2018	Addition of new source stream F3 -ACETYL (acetylene) and related emission source S1-3;Updates to Approach Description and Measurement Devices Table.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG145-10416-1	GHG Permit Application	05 December 2012	05 February 2013	

End of Introductory Note

Glossary of Terms

For the purposes of this permit the terms listed in the left hand column shall have the meaning given in the right hand column below:

The Agency	Environmental Protection Agency.
Agreement	Agreement in writing.
Allowance	Permission to emit to the atmosphere one tonne of carbon dioxide equivalent during a specified period issued for the purposes of Directive 2003/87/EC by the Agency or by a designated national competent authority of a Member State of the European Union.
Annual Reportable Emissions	Reportable Emissions of carbon dioxide made in any calendar year commencing from 1 January 2005 or the year of commencement of the activity, whichever is the later.
A & V Regulation	Commission Regulation (EU) No 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Category A Installation	As defined in Article 19.2 (a) of the M&R Regulation.
Category B Installation	As defined in Article 19.2 (b) of the M&R Regulation.
Category C Installation	As defined in Article 19.2 (c) of the M&R Regulation.
The Directive	Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
Emissions	The release of greenhouse gases into the atmosphere from sources in an installation.
EPA	Environmental Protection Agency.
Fall-Back Methodology	As defined in Article 22 of the M&R Regulation.
GHG	Greenhouse gas.
GHG Permit	Greenhouse gas emissions permit.
Greenhouse Gas	Any of the gases in Schedule 2 of the Regulations.
IPC/IE	Integrated Pollution Control/Industrial Emissions.
Installation	Any stationary technical unit where one or more activities listed in Schedule 1 to the Regulations are carried out. Also any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution. References to an installation include references to part of an installation.

Installation with low emissions	As defined in Article 47 of the M&R Regulation.
Major Source Streams	As defined in Article 19.3 (c) of the M&R Regulation.
M&R Regulation	Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Mis-statement	An omission, misrepresentation or error in the Operators reported data, not considering the uncertainty permissible pursuant to Article 12(1)(a) of Regulation (EU) no 601/2012.
N/A	Not applicable.
Monitoring Plan	The Plan submitted and approved in accordance with Condition 3.1 of this permit and attached at Appendix 1.
Non-conformity	Any act or omission by the Operator, either intentional or unintentional, that is contrary to the greenhouse gas emissions permit and the requirements of the Monitoring Plan.
The National Administrator	The person so designated in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC.
The Operator (for the purposes of this permit)	CRH Plc
“operator”	Any person who operates or controls an installation or to whom decisive economic power over the functioning of the installation has been delegated.
Person	Any natural or legal person.
Reportable emissions	The total releases to the atmosphere of carbon dioxide (expressed in tonnes of carbon dioxide equivalent) from the emission sources specified in Table 2 and arising from the Schedule 1 activities which are specified in Table 1.
The Regulations	European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 (S.I. No 490 of 2012) and any amendments or revisions thereto.
The Verifier	A legal person or another legal entity carrying out verification activities pursuant to Regulation (EU) No 600/2012 and accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 and Regulation (EU) No 600/2012 or a natural person otherwise authorised, without prejudice to Article 5(2) of Regulation (EC) No 765/2008, at the time a verification report is issued.
The Registry	The Registry as provided for under Article 19 of Directive 2003/87/EC.

Schedule 1

Schedule 1 to the Regulations.



Reasons for the Decision

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this permit, the Operator is capable of monitoring and reporting emissions in accordance with the requirements of the Regulations.

Activities Permitted

Pursuant to the Regulations the Agency issues this Greenhouse Gas Emissions Permit, subject to any subsequent revisions, corrections or modifications it deems appropriate, to:

The Operator:

CRH Plc
42 Fitzwilliam Square
Dublin 2
D02 R279

Company Registration Number: 12965

to carry out the following

Categories of activity:

Annex 1 Activity

Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day
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at the following installation(s):

Clogrennane Lime Limited (Toonagh Lime Works) **Installation number:** 116

located at

Ballybrody
Ennis
County Clare
V95 E431
Ireland

subject to the five conditions contained herein, with the reasons therefor and associated tables attached thereto.

Conditions

Condition 1. The Permitted Installation

- 1.1 This permit is being granted in substitution for the previous GHG permit granted to the Operator as listed in the Status Log of this GHG permit.
- 1.2 The Operator is authorised to undertake the activities and/or the directly associated activities specified in Table 1 below resulting in the emission of carbon dioxide:

Table 1 - Activities which are listed in Schedule 1 of the Regulations and other directly associated activities carried out on the site:

Installation No.: 116

Activity Description
Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day

Directly Associated Activity Description
N/A

- 1.3 Carbon dioxide from Schedule 1 activities shall be emitted to atmosphere only from the emission sources as listed in Table 2 below:

Table 2 Emission Sources and Capacities:

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S1.1	Kiln	379	tonnes/day
S1.2	Fuel Drying Burner	0.6	MW
S1.3	Acetylene Bottles - Mobile Welding Equipment	0.01	MW

- 1.4 The activity shall be controlled, operated and maintained so that emissions of carbon dioxide shall take place only as set out in this GHG Emissions Permit. The permit does not control emissions of gases other than carbon dioxide. All agreed plans, programmes and methodologies required to be carried out under the terms of this permit, become part of this permit.
- 1.5 This GHG Permit is for the purposes of GHG emissions permitting under the European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 and any amendments to the same only and nothing in this permit shall be construed as negating the Operator's statutory obligations or requirements under any other enactments or regulations unless specifically amended by the Regulations.
- 1.6 Any reference in this permit to 'installation' shall mean the installation as described in the Greenhouse Gas Emissions Permit application and any amendments approved by the Agency.

Reason: To describe the installation and clarify the scope of this permit.

Condition 2. Notification

- 2.1 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in a change in:
- 2.1.1 the nature or functioning of the installation;
 - 2.1.2 the capacity of the installation as detailed in this permit;
 - 2.1.3 the fuels used at the installation;
 - 2.1.4 the range of activities to be carried out at the installation
- that may require updating of the GHG permit shall be carried out or commenced without prior notice to and without the prior written agreement of the Agency.
- 2.2 The Operator shall notify the Agency in writing of the cessation of all or part of any activity listed in Table 1 of this permit no later than one month from the date of cessation or by 31 December of the year of cessation, whichever is sooner.
- 2.3 The Operator shall apply for an update of this GHG Permit where there is a change to the Operator name and/or registered address of the Operator, within seven days of the change.
- 2.4 For installations or parts of installations which have not come into operation when the application for this permit was made the Operator shall notify the Agency of the date of commencement of the activity within seven days of commencement.
- 2.5 The Operator shall notify the Agency in writing within three days of becoming aware of any factors which may prevent compliance with the conditions of this permit.
- 2.6 The Operator shall submit to the Agency by 21 January of each year a declaration of operability. The declaration submitted shall be in the format required by the Agency.
- 2.7 All notifications required under Condition 2 above shall be made to the address given in the Explanatory Note included with this permit.
- 2.8 The Operator shall submit to the Agency by 31 December of each year all relevant information about any planned or effective changes to the capacity, activity level and operation of an installation. The information submitted shall be in the format required by the Agency.

Reason: To provide for the notification of updated information on the activity.

Condition 3. Monitoring and Reporting

- 3.1 The Operator shall monitor and record greenhouse gas emissions on site in accordance with the M&R Regulation and the approved Monitoring Plan attached at Appendix 1 to this GHG permit and in compliance with any other guidance approved by the Agency for the purposes of implementing the Directive and/or the Regulations.
- 3.2 The Operator shall modify the monitoring plan in any of the following situations:
- 3.2.1 new emissions occur due to new activities carried out or due to the use of new fuels or materials not yet contained in the monitoring plan;
 - 3.2.2 the change of availability of data, due to the use of new measurement instrument types, sampling methods or analysis methods, or for other reasons, leads to higher accuracy in the determination of emissions;

- 3.2.3 data resulting from the previously applied monitoring methodology has been found incorrect;
- 3.2.4 changing the monitoring plan improves the accuracy of the reported data, unless this is technically not feasible or incurs unreasonable costs;
- 3.2.5 the monitoring plan is not in conformity with the requirements of the M&R Regulation and the Agency requests a change;
- 3.2.6 it is necessary to respond to the suggestions for improvement of the monitoring plan contained in the verification report.

The Operator shall notify any proposals for modification of the monitoring plan to the Agency without undue delay. Any significant modifications of the monitoring plan, as defined in Article 15 of the M&R Regulation, shall be subject to approval by the Agency. Where approved these changes shall be implemented within a timeframe agreed by the Agency.

3.3 Temporary changes to the monitoring methodology:

3.3.1 Where it is for technical reasons temporarily not feasible to apply the tier in the monitoring plan for the activity data or each calculation factor of a fuel or material stream as approved by the Agency, the Operator shall apply the highest achievable tier until the conditions for application of the tier approved in the monitoring plan have been restored. The Operator shall take all necessary measures to allow the prompt restoration of the tier in the approved monitoring plan. The Operator shall notify the temporary change to the monitoring methodology without undue delay to the Agency specifying:

- (i) The reasons for the deviation from the tier;
- (ii) in detail, the interim monitoring methodology applied by the Operator to determine the emissions until the conditions for the application of the tier in the monitoring plan have been restored;
- (iii) the measures the Operator is taking to restore the conditions for the application of the tier in the approved monitoring plan;
- (iv) the anticipated point in time when application of the approved tier will be resumed.

3.3.2 A record of all non-compliances with the approved monitoring plan shall be maintained on-site and shall be available on-site for inspection by authorised persons of the Agency and/or by the Verifier at all reasonable times.

3.4 The Operator shall appoint a Verifier to ensure that, before their submission, the reports required by Condition 3.5 below are verified in accordance with the criteria set out in Schedule 5 of the Regulations, the A&V Regulation and any more detailed requirements of the Agency.

3.5 The written report of the verified annual reportable emissions and the verification report in respect of each calendar year shall be submitted to the Agency by the Operator no later than 31 March of the following year. The reports shall be in the format required by the Agency and meet the criteria set out in the M&R and A&V Regulations.

3.6 The Operator shall enter the verified annual reportable emissions figure for the preceding year into the Registry no later than 31 March of the following year. This figure shall be electronically approved by the Verifier in the registry no later than 31 March of each year.

3.7 Where an Operator is applying the Fall-Back methodology, the Operator shall assess and quantify each year the uncertainties of all parameters used for the determination of the annual emissions in accordance with the ISO Guide to the Expression of Uncertainty in Measurement or another equivalent internationally accepted standard and include the verified results in the written report of the verified annual reportable emissions to be submitted to the Agency by 31 March each year.

- 3.8 An Operator shall submit to the Agency for approval a report containing the information detailed in (i) or (ii) below, where appropriate, by the following deadlines:
- (a) for a category A installation, by 30 June every four years;
 - (b) for a category B installation, by 30 June every two years;
 - (c) for a category C installation, by 30 June every year.
- (i) Where the Operator does not apply at least the tiers required pursuant to the first subparagraph of Article 26(1) and to Article 41(1) of the M&R Regulation, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply the required tiers. Where evidence is found that measures needed for reaching those tiers have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan and submit proposals for implementing appropriate measures and its timing.
- (ii) Where the Operator applies a fall-back monitoring methodology, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply at least tier 1 for one or more major or minor source streams. Where evidence is found that measures needed for reaching at least tier 1 for those source streams have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan, submit proposals and a timeframe for implementing appropriate measures.
- 3.9 Where the verification report states outstanding non conformities, misstatements or recommendations for improvements the Operator shall submit a report to the Agency for approval by 30 June of the year in which the verification report is issued. This requirement does not apply to the Operator of an installation with low emissions where the verification report contains recommendations for improvements only. The report shall describe how and when the Operator has rectified or plans to rectify the non-conformities identified and to implement recommended improvements. Where recommended improvements would not lead to an improvement of the monitoring methodology this must be justified by the Operator. Where the recommended improvements would incur unreasonable costs the Operator shall provide evidence of the unreasonable nature of the costs. The Operator shall implement the improvements specified by the Agency in response to the report submitted in accordance with this Condition in accordance with a timeframe set by the Agency.
- 3.10 The Operator shall make available to the Verifier and to the Agency any information and data relating to emissions of carbon dioxide which are required in order to verify the reports referred to in Condition 3.5 above or as required by the Agency to facilitate it in establishing benchmarks and/or best practice guidance.
- 3.11 Provision shall also be made for the transfer of environmental information, in relation to this permit, to the Agency's computer system, as may be requested by the Agency.
- 3.12 The Operator shall retain all information as specified in the M&R Regulation for a period of at least 10 years after the submission of the relevant annual report.
- 3.13 A record of independent confirmation of capacities listed in this permit shall be available on-site for inspection by authorised persons of the Agency at all reasonable times.
- 3.14 The Operator shall keep records of all modifications of the monitoring plan. The records shall include the information specified in Article 16.3 of the M&R Regulation.
- 3.15 The Operator shall ensure that members of the public can view a copy of this permit and any reports submitted to the Agency in accordance with this permit at all reasonable times. This

requirement shall be integrated with the requirements of any public information programme approved by the Agency in relation to any other permit or licence held by the Operator for the site.

Reason: *To provide for monitoring and reporting in accordance with the Regulations.*

Condition 4. Allowances

4.1 Surrender of Allowances

- 4.1.1 The Operator shall, by 30 April in each year, surrender to the Agency, or other appropriate body specified by the Agency, allowances equal to the annual reportable emissions in the preceding calendar year.
- 4.1.2 The number of allowances to be surrendered shall be the annual reportable emissions for the preceding calendar year plus such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due. This includes allowances to cover the amount of any annual reportable emissions in respect of which allowances were not surrendered in accordance with Condition 4.1.1 in the previous year, and the amount of any reportable emissions which were discovered during the previous year to have been unreported in reports submitted under Condition 3 in that or in earlier years.
- 4.1.3 In relation to activities or parts of activities which have ceased to take place and have been notified to the Agency in accordance with Condition 2.2 above, the Operator shall surrender to the Agency allowances equal to the annual reportable emissions from such activities in the preceding calendar year or part thereof, together with such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due as described in Condition 4.1.2 above.
- 4.1.4 The Operator may, from 2008 onwards, subject to the provisions of the Regulations and the relevant National Allocation Plan for that compliance year, surrender emission reduction units (ERUs) and certified emission reduction units (CERs) in place of allowances.

4.2 The holding, transfer, surrender and cancellation of allowances shall be in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC, any amendment or revision to the same and any guidance issued by the Agency or the National Administrator.

4.3 The Operator shall provide the National Administrator with all the necessary information for the opening of an Operator holding account for the installation described in Condition 1 of this permit within twenty working days of the issue of this permit, unless such an account is already open.

Reason: *To provide for the surrendering, holding, transfer and cancellation of allowances in respect of reported emissions.*

Condition 5. Penalties

- 5.1 Any Operator who fails to comply with Condition 4.1 above shall be subject to the provisions of the Regulations, including, but not limited to the payment of penalties.

Reason: To provide for the payment of excess emissions penalties as required under the Regulations.

Sealed by the seal of the Agency on this the 08 February 2018:

PRESENT when the seal of the Agency was affixed hereto:

Ms. Annette Prendergast
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG145-10416

Monitoring Plan

1. Guidelines & Conditions

1. Directive 2003/87/EC as amended by Directive 2009/29/EC (hereinafter "the (revised) EU ETS Directive") requires operators of installations which are included in the European Greenhouse Gas Emission Trading Scheme (the EU ETS) to hold a valid GHG emission permit issued by the relevant Competent Authority and to monitor and report their emissions and have the reports verified by an independent and accredited verifier.

The Directive can be downloaded from:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF>

2. The Monitoring and Reporting Regulation (Commission Regulation (EU) No 601/2012) (hereinafter the "MRR") defines further requirements for monitoring and reporting.

The MRR can be downloaded from:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0030:0104:EN:PDF>

Article 12 of the MRR sets out specific requirements for the content and submission of the monitoring plan and its updates. Article 12 outlines the importance of the Monitoring plan as follows:

The monitoring plan shall consist of a detailed complete and transparent documentation of the monitoring methodology of a specific installation [or aircraft operator] and shall contain at least the elements laid down in Annex I.

Furthermore Article 74(1) states:

Member States may require the operator and aircraft operator to use electronic templates or specific file formats for submission of monitoring plans and changes to the monitoring plan as well as for submission of annual emissions reports tonne-kilometre data reports verification reports and improvement reports. Those templates or file format specifications established by the Member States shall at least contain the information contained in electronic templates or file format specifications published by the Commission

3. All Commission guidance documents on the Monitoring and Reporting Regulation will be published at the link below as they become available:

http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

(a) Information sources:

EU Websites:

EU-Legislation: <http://eur-lex.europa.eu/en/index.htm>

EU ETS general: http://ec.europa.eu/clima/policies/ets/index_en.htm

Monitoring and Reporting in the EU ETS: http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

Environmental Protection Agency Website:

<http://www.epa.ie>

Environmental Protection Agency Contact:

GHGpermit@epa.ie

2. Application Details

The Installation Name, Site Name and the address of the site of the installation are detailed below. The Site Name and address can be updated from the Organisation Details Page on the ETSWAP website. The Installation Name can only be updated by your Competent Authority.

Installation name	Clogrennane Lime Limited (Toonagh Lime Works)
Site name	Clogrennane Lime Limited (Toonagh Lime Works)
Address	Ballybrody Ennis County Clare V95 E431 Ireland

Grid reference of site main entrance	130155 E , 183351 N
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Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes
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IPC/IE Licence Register Number	Licence holder	Competent body
P0771-02	Clogrennane Lime Ltd, Toonagh Lime Works	EPA

Has the regulated activity commenced at the Installation? Yes

Date of Regulated Activity commencement	01 January 2008
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This information is only required to identify the first relevant reporting year of an installation. If the installation was in operation from the beginning of 2008 and held a Greenhouse Gas Emissions Permit from this point, 1 January 2008 will be used where the actual date of commencement is not readily known.

3. About the Operator

The information about the "Operator" is listed below. The "Operator" is defined as the person who it is proposed will have control over the relevant Regulated Activities in the installation in respect of which this application is being made.

(b) Operator Details

The name of the operator and where applicable the company registration number are detailed below. These details can only be updated by the Environmental Protection Agency.

Operator name	CRH Plc
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Company Registration Number	12965
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Operator Legal status

The legal status of the operator is:	Company / Corporate Body
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(c) Company / Corporate Body

Is the trading / business name different to the operator name? No

Details of the individual authorised to submit this application on behalf of the company / corporate body.

Title	█
Forename	█
Surname	██████
Position	Technical Manager

Registered office address

Address Line 1	42 Fitzwilliam Square
Address Line 2	N/A
City/Town	Dublin 2
County	N/A
Postcode	D02 R279

Principal office address

Is the principal office address different to the registered office address? No

Holding company

Does the company belong to a holding company? No

(d) Operator Authority

Does the operator named above have the authority and ability to:

- | | |
|---|-----|
| a. manage site operations through having day-to-day control of plant operation including the manner and rate of operation | Yes |
| b. ensure that permit conditions are effectively complied with | Yes |
| c. control monitor and report specified emissions | Yes |
| d. be responsible for trading in Allowances so that at the | Yes |

end of a reporting period allowances can be balanced against reported emissions.

4. Service Contact

e. Service Contact

Name

[REDACTED]

Address / Email Address

Clogrennane Lime Limited
Clogrennane
County Carlow
Ireland

5. Installation Activities

f. Installation Description

Below is a description of the installation and its activities, a brief outline description of the site and the installation and the location of the installation on the site. The description also includes a non-technical summary of the activities carried out at the installation briefly describing each activity performed and the technical units used within each activity.

The purpose of the installation is the production of lime. Limestone purchased from an adjacent quarry is calcined in a kiln. The kiln is the main emissions source on site. Emissions from the kiln include both process emissions (from the conversion of carbonates to oxides) and emissions from the fuel used in heating. Fuel used on site consists mainly of petcoke. Other emissions sources include a fuel dryer using diesel/gas oil and mobile equipment using acetylene bottles. All parts of the installation are operated by the applicant.

g. Annex 1 Activities

The table below lists the technical details for each Annex 1 activity carried out at the installation.

Note that 'capacity' in this context means:

- Rated thermal input (for combustion installations) which is defined as the rate at which fuel can be burned at the maximum continuous rating of the installation multiplied by the calorific value of the fuel and expressed as megawatts thermal.
- Production capacity for those specified Annex I activities for which production capacity determines ETS eligibility.

Annex 1 Activity	Total Capacity	Capacity units	Specified Emissions
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Annex 1 Activity	Total Capacity	Capacity units	Specified Emissions
Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day	379	tonnes/day	Carbon Dioxide

h. Site Diagram

The table below lists attachments (if available) that provide a simple diagram showing emissions sources source streams sampling points and metering/measurement equipment.

Attachment	Description
Toonagh Sitemap.pdf	Toonagh Sitemap

i. Estimated Annual Emissions

Detail of the estimated annual emission of CO₂ equivalent. This information enables categorisation of the installation in accordance with Article 19 of the MRR and is based on the average verified annual emissions of the previous trading period data OR if this data is not available or is inappropriate a conservative estimate of annual average emissions including transferred CO₂ excluding CO₂ from biomass.

Estimated Annual Emissions (tonnes CO_{2(e)}) 74500

6. Emissions Details

j. About your emissions

Annex I of the Monitoring and Reporting Regulations (MRR) requires that monitoring plans include a description of "the installation" and activities to be carried out and monitored including a list of emission sources and source streams. The information provided in this template relates to the Annex I activity(ies) comprised in the installation in question and should relate to a single installation. It includes any activities carried out by the operator and does not include related activities carried out by other operators.

k. Emission Sources

The table below lists all the emission sources at the installation, which may include directly associated activities/excluded activities.

Emission Source Reference	Emission Source Description
S1.1	Kiln

Emission Source Reference	Emission Source Description
S1.2	Fuel Drying Burner
S1.3	Acetylene Bottles - Mobile Welding Equipment

The table below lists the emission sources which are linked to the Regulated Activities at the installation.

Emission Source Reference	Emission Source Description
S1.1	Kiln
S1.2	Fuel Drying Burner
S1.3	Acetylene Bottles - Mobile Welding Equipment

I. Emission Points

The table below lists all the emission points at the installation, which may include directly associated activities/excluded activities.

Emission Point Reference	Emission Point Description
A1.1	Kiln Stack
A1.2	Burner Stack
A1.3	Acetylene Bottles - Mobile Welding Equipment

m. Source Streams (fuels and/or materials)

The table below lists the source streams which are used in Schedule 1 Activities at the installation.

Source Stream Reference	Source Stream Type	Source Stream Description
M1 - Ca	Lime / dolomite / magnesite: Carbonates (Method A)	Limestone
M2 - Mg	Lime / dolomite / magnesite: Carbonates (Method A)	Limestone
F1 - PC	Combustion: Solid fuels	Petroleum Coke
F2 - DSL	Combustion: Commercial standard fuels	Gas/Diesel Oil
F3 - ACETYL	Combustion: Other gaseous & liquid fuels	Acetylene bottles

n. Emissions Summary

The table below provides a summary of the emission source and source stream details in the installation.

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
M1 - Ca	S1.1	A1.1	Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day
M2 - Mg	S1.1	A1.1	Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day
F1 - PC	S1.1	A1.1	Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day
F2 - DSL	S1.2	A1.2	Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day
F3 - ACETYL	S1.3	A1.3	Production of lime or calcination of dolomite or magnesite in rotary kilns or in other furnaces with a production capacity exceeding 50 tonnes per day

o. Excluded Activities

Certain activities that result in greenhouse gas emissions may be excluded under the EU ETS Directive for example truly mobile sources such as vehicle emissions.

Do you have any excluded activities which need to be identified in your monitoring plan? No

7. Low Emissions Eligibility

p. Low Emissions Eligibility

The operator may submit a simplified monitoring plan for an installation where no nitrous oxide activities are carried out and it can be demonstrated that:

(a) the average verified annual emissions of the installation during the previous trading period was less than 25 000 tonnes CO_{2(e)} per year or;

(b) where this data is not available or inappropriate a conservative estimate shows that emissions for the next 5 years will be less than 25 000 tonnes CO_{2(e)} per year.

Note: the above data shall include transferred CO₂ but exclude CO₂ stemming from biomass.

Does the installation satisfy the criteria for installations with low emissions (as defined by Article 47 of the MRR)? ☐ No

8. Monitoring Approaches

q. Monitoring Approaches

Emissions may be determined using either a calculation based methodology ("calculation") or measurement based methodology ("measurement") except where the use of a specific methodology is mandatory according to the provisions of the MRR. [MRR Article 21].

Note: the operator may subject to competent authority approval combine measurement and calculation for different sources. The operator is required to ensure and demonstrate that neither gaps nor double counting of reportable emissions occurs.

Please specify whether or not you propose to apply the following monitoring approaches. Select all monitoring approaches that are applicable to you. The consecutive sections will become mandatory based on the selected approaches.

Calculation	<input type="checkbox"/> Yes
Measurement	<input type="checkbox"/> No
Fall-back approach	<input type="checkbox"/> No
Monitoring of N ₂ O	<input type="checkbox"/> No
Monitoring of PFC	<input type="checkbox"/> No
Monitoring of transferred / inherent CO ₂	<input type="checkbox"/> No

9. Calculation

r. Approach Description

The calculation approach including formulae used to determine annual CO₂ emissions:

A) For each source stream, where default values for calculation factors are used (diesel/gas oil and acetylene), the activity data is first summed up, then the calculation formula according to Article 24(1) is used.

$$\text{CO}_2 = \text{Activity data (Fuel Consumed (Ktonnes or Nm}^3\text{))} * \text{NCV(TJ/kt or TJ/Nm}^3\text{))} * \text{Emission Factor (tCO}_2\text{/TJ)} * \text{Oxidation Factor}$$

A.1) Diesel/Gas Oil

Diesel/gas oil consumption is determined using suppliers invoices and the opening and closing stock is determined annually by a stock survey. $OS + P - CS = U$ where P is purchases detailed in the suppliers invoices and OS and CS refer to opening and closing stocks. The density of diesel/gas oil is provided by the supplier. Tier 2a country specific NCV and Tier 2a country specific Emission Factor are applied. These values are as provided by the EPA on an annual basis. The Tier 1 Oxidation Factor (1.0) is applied.

$$\text{Activity data (fuel consumption} * \text{NCV)} * \text{emission factor} * \text{oxidation factor} = \text{final emission of CO}_2 \text{ (t)}$$

A.2) Acetylene

Acetylene consumption is determined using suppliers invoices of the number of bottles. An opening and closing stock is determined annually by an internal stock survey.

$$OS + P - CS = U$$

Cubic meters of each type of bottle is provided by the supplier.

Tier 1 NCV and Tier 1 Emission Factor for acetylene are applied as provided by the EPA on an annual basis. The Tier 1 Oxidation Factor (1.0) is applied.
$$\text{Activity data (fuel consumption} * \text{NCV)} * \text{emission factor} * \text{oxidation factor} = \text{CO}_2 \text{ emission.}$$

B) For each source stream, where analysis results are used for calculation factors (CaCO₃/MgCO₃, kiln dust, petcoke), the activity data and calculation factors of each batch, to which the analyses relate, are first used for the calculation formula according to Article 24(1). The resulting emissions for each batch are then summed up to the annual emissions value of the source stream.

B.1) Carbonate emissions (stone/lime/kiln dust) -(Method A)

The annual quantity of limestone (t) is measured by a loadcell as it is fed into the kiln. (M1-Ca and M2-Mg source streams). The Tier 1 emission factors for M1-Ca and M2-Mg are calculated based on the relevant carbonate content of the input material (Calcium Carbonate and Magnesium Carbonate respectively) determined by analysis in an ISO17025 accredited laboratory and the relevant stoichiometric ratio listed in Table 2 of Annex VI of the Monitoring and Reporting Regulations (MRR). Carbonate content is adjusted for moisture and gangue content of the material. In accordance with Section 10.B of Annex IV of the MRR, carbonates of calcium and magnesium and any other relevant carbonates in the raw materials shall always be taken into account. In addition annual analysis will be carried to determine if there is any relevant organic carbon in the kiln input material and this will be taken into account where relevant.

For calcium carbonate source stream (M1-Ca) the Tier 2 Conversion factor is determined by analysis of the input material and the residual CaCO₃ carbonate leaving the kiln in both the lime and the kiln dust.

Conversion factor $f(M1-Ca) = 1 - (t \text{ lime output} * \% \text{ residual CaCO}_3 \text{ in lime} + t \text{ kiln dust output} * \% \text{ CaCO}_3 \text{ in kiln dust}) / (t \text{ limestone input} * \% \text{ CaCO}_3 \text{ purity})$

For $MgCO_3$, due to the lower conversion temperature, all $MgCO_3$ is converted to MgO and so a Tier 1 conversion factor of 1 is applied. Lime and kiln dust is therefore not analysed for residual $MgCO_3$. $(MgCO_3) \text{ consumed} = (t \text{ limestone input} * \% MgCO_3 \text{ purity})$

B.2) Petcoke

Petcoke consumption (t) is determined based on the following; Opening stock at the beginning of the reporting year. This is determined by a stock survey. Petcoke brought onto site in the reporting year ('purchases') is weighed over a calibrated weighbridge. Closing stock at the end of the reporting year. This is determined by a stock survey with the bulk density of the pet coke determined in the on site laboratory. $OS + P - CS = \text{Pet Coke combusted}$.

Calculation factors (NCV and Emission Factor) are determined based on analysis of the fuel as it is loaded onto the ship prior to arrival at Clogrennane. The pet coke is sampled and analysed in an ISO 17025 accredited laboratory in accordance with Article 32 to 35 and Annex VII of the MRR and therefore a Tier 3 NCV and Tier 3 Emission Factor are applied. An oxidation factor of 1.0 is applied.

Petcoke from more than one ship may be used in the course of the reporting year. At no time is petcoke from any ship mixed at the storage locations (off site). The amount of petcoke from each ship is known and this amount, used in the reporting year, has the relevant calculation factors applied. Emissions from each set of petcoke used (determined using the activity data and calculation factors as above) are then summed to give a total emission from the petcoke stream.

s. Measurement Devices

Below is a description of the specification and location of the measurement systems used for each source stream where emissions are determined by calculation

Also a description of all measurement devices including sub-meters and meters used to deduct non-Annex I activities to be used for each source and source stream.

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
M1 - Ca,M2 - Mg	S1.1	MD1	Loadcell	0.5-10.5	tonnes	0.10	Kiln Building
F1 - PC	S1.1	MD2	Weighbridge	0-50000	kg	0.12	Yard
F2 - DSL	S1.2	MD3	Truck Meter	0-2200	Litres	0.1	Delivery Truck
F3 - ACETYL	S1.3	MD4	Surveyor Quantity	0-1	Units	2	Fuel storage area
F1 - PC	S1.1	MD5	Bulk Density Apparatus	0-5	kg	2.16	On site laboratory
F1 - PC	S1.1	MD6	Surveyor-Solids	N/A	m3	2	Fuel Storage Area
F2 - DSL	S1.2	MD7	Surveyor Stock Take	N/A	m3	2	Fuel Storage Area

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Control Of	Under	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
M1 - Ca,M2 - Mg	MD1	Batch	Operator		N/A	N/A	N/A
F1 - PC	MD2	Batch	Operator		N/A	N/A	N/A
F2 - DSL	MD3	Batch	Trade partner		Yes	Yes	Yes
F3 - ACETYL	MD4	Batch	Trade partner		Yes	Yes	Yes
F1 - PC	MD5	Batch	Operator		N/A	N/A	N/A
F1 - PC	MD6	Batch	Trade partner		Yes	Yes	Yes
F2 - DSL	MD7	Batch	Trade partner		Yes	Yes	Yes

t. Applied Tiers

The table below identifies the tiers applied against the relevant input data for each source stream and confirms whether a standard (MRR Article 24) or mass balance (MRR Article 25) approach is applied.

(i) The highest tiers as defined in Annex II of the MRR should be used by Category B and C installations to determine the activity data and each calculation factor (except the oxidation factor and conversion factor) for each major source stream. Category A installations should apply as a minimum the tiers listed in Annex V.

(ii) Operators may apply a tier one level lower than those referred to in sub paragraph (i) above for Category C installations and up to two levels lower for Category A and B installations with a minimum of tier 1 if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier. The justification for not applying the higher tier should be recorded when completing the tier table.

(iii) The competent authority may allow an operator to apply even lower tiers than those referred to in the sub paragraph (ii) with a minimum of tier 1 for a transition period of up to three years if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier and provides an improvement plan detailing how and by when at least the tier referred to in sub paragraph (ii) will be achieved. The improvement plan should be referenced in subsequent table and provided to the competent authority at the time of submission of this plan.

(iv) For minor source streams operators shall apply the highest tier which is technically feasible and will not lead to unreasonable costs with a minimum of tier 1 for activity data and each calculation factor. For de-minimis source streams operators may use conservative estimations rather than tiers unless a defined tier can be achieved without additional effort (MRR Article 26(2)).

(v) Installations with low emissions as identified in section 6(d) may apply as a minimum tier 1 for determining activity data and calculation factors for all source streams unless higher accuracy is achievable without additional effort.

* Note 1: For commercial standard fuels the minimum tiers listed in Annex V of the MRR may be applied for all activities in all installations.

* Note 2: If you are intending to apply a fall-back approach please complete the table below and select "n/a" for the tiers to be applied for each source stream where a fall-back approach is used. Section 10 "Fall-back" must also be completed for these source streams.

* Note 3: For biomass or mixed fuels the emission factor is the preliminary emission factor as defined in Definition 35 Article 3 of the MRR.

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions tCO _{2(e)}	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
M1 - Ca	S1.1	MD1	<1.5%	Standard	3	N/A	1	N/A	N/A	2	N/A	50650	67.99	Major	Yes	n/a	n/a
F1 - PC	S1.1	MD2	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	22600	30.34	Major	Yes	n/a	n/a
F2 - DSL	S1.2	MD3	<1.5%	Standard	2	2a	2a	N/A	1	N/A	N/A	200	0.27	De-minimis	Yes	n/a	n/a
M2 - Mg	S1.1	MD1	<1.5%	Standard	3	N/A	1	N/A	N/A	1	N/A	1050	1.41	De-minimis	Yes	n/a	n/a
F3 - ACETYL	S1.3	MD4	<5.0%	Standard	No tier	1	1	N/A	1	N/A	N/A	0.1	0	De-minimis	Yes	n/a	n/a

Total Estimated Emissions for Calculation (tonnes CO_{2(e)})

74500.1

u. Uncertainty Calculations

The table below lists evidence attached to the application that demonstrates compliance with the applied tiers in accordance with Article 12 of the MRR.

Attachment	Description
Uncertainty Associated With Measurement of Petcoke Activity Data_T.pdf	Uncertainty for F1
AMC - Jul 2012 - 1 of 2.pdf	Uncertainty for F2 (1)
AMC - Jul 2012 - 2 of 2.pdf	Uncertainty for F2 (2)
Uncertainty Associated with Kiln Loadcell_T.pdf	Uncertainty associated with kiln load cell
Acetylene Output Levels.docx	Acetylene Output Levels
20180130 Procon Calibration - Kiln Load Cells Toonagh.pdf	2018 Certificate of Calibration for load cell at Toonagh
Clogrennane Stock Measurement Accuracy 160527.pdf	Clogrennane Stock Measurement Accuracy
Precia Calibration 21125.pdf	2017 Weighbridge Calibration Cert

v. Applied tiers

Applied tiers for each source stream

Source Stream Ref.	Emission Source Refs.	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied
M1 - Ca	S1.1	3	N/A	1	N/A	N/A	2	N/A
F1 - PC	S1.1	4	3	3	N/A	1	N/A	N/A
F2 - DSL	S1.2	2	2a	2a	N/A	1	N/A	N/A
M2 - Mg	S1.1	3	N/A	1	N/A	N/A	1	N/A
F3 - ACETYL	S1.3	No tier	1	1	N/A	1	N/A	N/A

w. Justification for Applied tiers

Justifications for the applied tiers for each major source stream where highest tiers are not currently achieved.

Source Stream Ref.	Emission Source Refs.	Justification for the applied tier	Improvement Plan Reference (where applicable)
N/A	N/A	N/A	N/A

10. Calculation Factors

x. Default Values

The table below lists, for each parameter, where default values are to be used for calculation factors.

Source Stream Refs.	Emission Source Refs.	Parameter	Reference Source	Default Value applied (where appropriate)
M1 - Ca	S1.1	Emission Factor	MRR Annex VI (2)	0.44
M2 - Mg	S1.1	NCV	MRR Annex VI (2)	0.522
F2 - DSL	S1.2	NCV and Emission Factor	Irelands National Greenhouse Gas Inventory (EPA Website)	n/a
F3 - ACETYL	S1.3	NCV and Emission Factor	EPA Website Tier 1 NCV & EF	n/a
F1 - PC,F2 - DSL,F3 - ACETYL	S1.1,S1.2,S1.3	Oxidation Factor	MRR Annex II	n/a

Sampling and Analysis

Do you undertake sampling and analysis of any of the parameters used in the calculation of your CO₂ emissions? Yes

y. Analysis

The table below lists, for each source stream, where calculation factors are to be determined by analysis.

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
M1 - Ca,M2 - Mg	S1.1	Emission Factor (Carbonate Content in Input Material)	Standard Methods, EN12485, EN459	Once every 50000 tonnes and at least 4 times per year	IKM	Yes	n/a

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
M1 - Ca	S1.1	Conversion Factor (Residual Carbonate in kiln dust and lime product)	Standard Methods, EN12485, EN459	Once every 50000 tonnes and at least 4 times per year	IKM	Yes	n/a
M1 - Ca, M2 - Mg	S1.1	Total Organic Carbon in limestone/kiln feed	DIN EN 13639	Annually	IKM	Yes	n/a
F1 - PC	S1.1	NCV	ASTM D5865	Once every 20000 tonnes and at least 6 times per year	Incolab Services B.V.; Andrew S. McCreath	Yes	n/a
F1 - PC	S1.1	Emission Factor (Carbon Content)	ASTM D 5373; ASTM D5292	Once every 20000 tonnes and at least 6 times per year	Incolab Services B.V.; Andrew S. McCreath	Yes	n/a
F1 - PC	S1.1	Moisture Content	ASTM D4931	Once every 2000t and at least 6 times per year	Incolab Services B.V.	Yes	n/a

Detail about the written procedures for the above analysis.

Where a number of procedures are used details of an overarching procedure which covers the quality assurance of analyses methods and links together individual analytical methods is listed.

Title of procedure	Details of External Materials Testing
Reference for procedure	GHG 09
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the materials and fuels to be tested, the approved laboratories and the testing requirements for each parameter
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	EN12485
	EN459
	ASTM D 5865
	ASTM D 4931

z. Sampling Plan

Details about the procedure covering the sampling plan for the analysis table above.

The procedure below covers the elements of a sampling plan as required by Article 33 of the MRR. Where a number of procedures are used, details of an overarching procedure which covers the sampling methods and links together individual sampling methods are listed.

Attachment	Description
GHG 14.1 Sampling Plan - Limestone.pdf	Sampling Plan for Limestone
GHG 14.2 Sampling Plan - Lime.pdf	Sampling Plan for Lime
GHG 14.3 Sampling Plan - Kiln Dust.pdf	Sampling Plan for Kiln Dust
GHG 14.4 Sampling Plan - Petcoke.pdf	Sampling Plan for Petcoke

Title of procedure	Sampling Plan
Reference for procedure	GHG 14
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the general provisions for sampling stone, lime, kiln dust and petcoke, including preparation of samples, retention of samples and approved laboratories.
	Links to the individual sampling plans for each source stream.
Post or department responsible for the procedure and for any data generated	Technical Manager

Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

aa. Sampling Plan Appropriateness

The procedure to be used to revise the appropriateness of the sampling plan.

Title of procedure	Revision of Sampling Plan
Reference for procedure	GHG 16
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Details the inclusion in the internal audit programme. Describes the parameters to be reviewed. Describes actions to be taken if a failure / improvement is identified.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

Are stock estimates carried out as part of the emission calculations?	Yes
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bb. Year-end reconciliations

The procedure to be used to estimate stocks at the beginning/end of a reporting period where applicable. This should include any source streams monitored using batch metering e.g. where invoices are used.

Title of procedure	Annual Stock Survey
Reference for procedure	GHG 17
Diagram reference	N/A
Brief description of procedure.	Describes materials to be surveyed. Details data handling of the results of the survey. Details any corrections to year end.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

cc. Tracking Instruments

The procedure used to keep track of instruments installed in the installation used for determining activity data.

Title of procedure	Calibration List
Reference for procedure	GHG 18
Diagram reference	N/A
Brief description of procedure.	Lists the GHG equipment on site.
	Describes the calibration schedule and minimum requirements.
	References the relevant procedure in the event of a failure.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

11. Management

dd. Monitoring and Reporting Responsibilities

Responsibilities for monitoring and reporting emissions from the installation are listed below:

Relevant job titles/posts and provide a succinct summary of their role relevant to monitoring and reporting are listed below.

Job Title / Post	Responsibilities
Technical Manager	Primary contact for all GHG correspondence. Responsible for preparation of permit, monitoring plans and submissions. Responsible for complying with timeframes for submission of allowances.
Managing Director	Final responsibility for ensuring compliance with GHG process
Quality and Environmental Officer	Preparation of quarterly and other samples
Financial Director	Review of GHG calculations and inputs

Attachment	Description
N/A	N/A

ee. Assignment of Responsibilities

Details of the procedure used for managing the assignment of responsibilities for monitoring and reporting within the installation and for managing the competencies of responsible personnel in accordance with Article 58(3)(c) of the MRR:

This procedure identifies how the monitoring and reporting responsibilities for the roles identified above are assigned and how training and reviews are undertaken.

Title of procedure	Roles and Responsibilities
Reference for procedure	GHG 03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the roles, responsibilities, competencies and training requirements for those involved in GHG operations.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

ff. Monitoring Plan Appropriateness

Details of the procedure used for regular evaluation of the monitoring plan's appropriateness covering in particular any potential measures for the improvement of the monitoring methodology:

Title of procedure	Definition and Evaluation of the Control System
Reference for procedure	GHG 02
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Checklist of compliance with current stated tiers and uncertainty thresholds.
	Statement of inclusion in the internal audit process.
	Reference to procedure for actions in the event of identified improvements / changes / errors
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

gg. Data Flow Activities

Details of the procedures used to manage data flow activities in accordance with Article 57 of the MRR:

Title of procedure	Sequence and Interaction of Data Acquisitions & Handling Activities, Including Methods of Calculations and Measurements
Reference for procedure	GHG 01
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the relevant inputs, calculations and outputs of the GHG system.
	Describes data flow.
	Describes calculations and measurements.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A
List of primary data sources	Weighbridge dockets
	Loadcell records
	Surveyors reports
	Invoices
	Laboratory test certificates
Description of the relevant processing steps for each specific data flow activity.	calculation approach including formulae used to determine annual CO ₂ emissions:
Identify each step in the data flow and include the formulas and data used to determine emissions from the primary data. Include details of any relevant electronic data processing and storage systems and other inputs (including manual inputs) and confirm how outputs of data flow activities are recorded	<p>A) For each source stream, where default values for calculation factors are used (diesel/gas oil and acetylene), the activity data is first summed up, then the calculation formula according to Article 24(1) is used.</p> $\text{CO}_2 = \text{Activity data (Fuel Consumed (Ktonnes or Nm}^3\text{))* NCV(TJ/kt or TJ/Nm}^3\text{))* Emission Factor (tCO}_2\text{/TJ)* Oxidation Factor}$ <p>A.1) Diesel/Gas Oil</p> <p>Diesel/gas oil consumption is determined using suppliers invoices and the opening and closing stock is determined annually by a stock survey. $OS + P - CS = U$ where P is purchases detailed in the suppliers invoices and OS and CS refer to opening and closing stocks. The density of diesel/gas oil is provided by the supplier. Tier 2a country specific NCV and Tier 2a country specific Emission Factor are applied. These values are as provided by the EPA on an</p>

annual basis. The Tier 1 Oxidation Factor (1.0) is applied.

Activity data (fuel consumption*NCV) * emission factor*oxidation factor = final emission of CO₂ (t)

A.2) Acetylene

Acetylene consumption is determined using suppliers invoices of the number of bottles. An opening and closing stock is determined annually by an internal stock survey.

$$OS + P - CS = U$$

Cubic meters of each type of bottle is provided by the supplier.

Tier 1 NCV and Tier 1 Emission Factor for acetylene are applied as provided by the EPA on an annual basis. The Tier 1 Oxidation Factor (1.0) is applied. Activity data (fuel consumption*NCV) * emission factor*oxidation factor = CO₂ emission.

B) For each source stream, where analysis results are used for calculation factors (CaCO₃/MgCO₃, kiln dust, petcoke), the activity data and calculation factors of each batch, to which the analyses relate, are first used for the calculation formula according to Article 24(1). The resulting emissions for each batch are then summed up to the annual emissions value of the source stream.

B.1) Carbonate emissions (stone/lime/kiln dust) -(Method A)

The annual quantity of limestone (t) is measured by a loadcell as it is fed into the kiln. (M1-Ca and M2-Mg source streams). The Tier 1 emission factors for M1-Ca and M2-Mg are calculated based on the relevant carbonate content of the input material (Calcium Carbonate and Magnesium Carbonate respectively) determined by analysis in an ISO17025 accredited laboratory and the relevant stoichiometric ratio listed in Table 2 of Annex VI of the Monitoring and Reporting Regulations (MRR). Carbonate content is adjusted for moisture and gangue content of the material. In accordance with Section 10.B of Annex IV of the MRR, carbonates of calcium and magnesium and any other relevant carbonates in the raw materials shall always be taken into account. In addition annual analysis will be carried to determine if there is any relevant organic carbon in the kiln input material and this will be taken into account where relevant.

For calcium carbonate source stream (M1-Ca) the Tier 2 Conversion factor is determined by analysis of the input material and the residual CaCO_3 carbonate leaving the kiln in both the lime and the kiln dust.

Conversion factor $f(\text{M1-Ca}) = 1 - (\text{t lime output} * \% \text{ residual } \text{CaCO}_3 \text{ in lime} + \text{t kiln dust output} * \% \text{ CaCO}_3 \text{ in kiln dust}) / (\text{t limestone input} * \% \text{CaCO}_3 \text{ purity})$

For MgCO_3 , due to the lower conversion temperature, all MgCO_3 is converted to MgO and so a Tier 1 conversion factor of 1 is applied. Lime and kiln dust is therefore not analysed for residual MgCO_3 . $(\text{MgCO}_3) \text{ consumed} = (\text{t limestone input} * \% \text{MgCO}_3 \text{ purity})$

B.2) Petcoke

Petcoke consumption (t) is determined based on the following; Opening stock at the beginning of the reporting year. This is determined by a stock survey. Petcoke brought onto site in the reporting year ('purchases') is weighed over a calibrated weighbridge. Closing stock at the end of the reporting year. This is determined by a stock survey with the bulk density of the pet coke determined in the on site laboratory. $\text{OS} + \text{P} - \text{CS} = \text{Pet Coke combusted}$.

Calculation factors (NCV and Emission Factor) are determined based on analysis of the fuel as it is loaded onto the ship prior to arrival at Clogrennane. The pet coke is sampled and analysed in an ISO 17025 accredited laboratory in accordance with Article 32 to 35 and Annex VII of the MRR and therefore a Tier 3 NCV and Tier 3 Emission Factor are applied. An oxidation factor of 1.0 is applied.

Petcoke from more than one ship may be used in the course of the reporting year. At no time is petcoke from any ship mixed at the storage locations (off site). The amount of petcoke from each ship is known and this amount, used in the reporting year, has the relevant calculation factors applied. Emissions from each set of petcoke used (determined using the activity data and calculation factors as above) are then summed to give a total emission from the petcoke stream. Additional details are included in the onsite procedures GHG 01 and GHG 12.

Submit relevant documents to record data flow activities

Attachment	Description
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Attachment	Description
GHG 12.pdf	Data Flow Chart
GHG 01.pdf	Sequence and interaction

hh. Assessing and Controlling Risks

Details of the procedures used to assess inherent risks and control risks in accordance with Article 58 of the MRR:

Title of procedure	Risk Assessment
Reference for procedure	GHG 16
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the full risk assessment. References inclusion in the internal audit process. Describes actions to be taken in the event of a non-compliance, change in risk levels or levels of unacceptable risk.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

ii. Quality Assurance of Metering / Measuring Equipment

Details of the procedures used to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR.

Title of procedure	Quality Assurance of Measuring Equipment and Information Technology Used
Reference for procedure	GHG 04
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Lists all GHG related equipment under the operators control Links to calibration schedule and records Description of procedure in the event of an error / failure / compromise of data
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A

List of EN or other standards applied N/A

jj. Quality Assurance of Information Technology used for Data Flow Activities

Details of the procedures used to ensure quality assurance of information technology used for data flow activities in accordance with Article 58 and 60 of the MRR:

Title of procedure	Quality Assurance of Measuring Equipment and Information Technology Used
Reference for procedure	GHG 04
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Lists all GHG related equipment under the operators control
	Links to calibration schedule and records
	Description of procedure in the event of an error / failure / compromise of data
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

kk. Review and Validation of Data

Details of the procedures used to ensure regular internal reviews and validation of data in accordance with Articles 58 and 62 of the MRR.

Title of procedure	Internal Review of reported data
Reference for procedure	GHG 05
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the processes of internal audit + Financial Directors review of data
	Describes the cross checks (financial records / previous years cross checks etc)
	Describes the timeframes involved to all re-calculation of data in the event of an error
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

II. Corrections and Corrective Actions

Details of the procedures used to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR:

Title of procedure	Corrections and Corrective Actions
Reference for procedure	GHG 07
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the actions to be taken in the event of an error / failure, including re-calculation of data and notification of the verifier / EPA
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

mm. Control of Outsourced Activities

Details of the procedures used to control outsourced processes in accordance with Articles 59 and 64 of the MRR.

Title of procedure	Outsourced Processes
Reference for procedure	GHG 06
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the minimum requirements for external analysis
	Lists the approved suppliers for the GHG system
	Describes the checks applied to incoming data
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

nn. Record Keeping and Documentation

Details of the procedures used to manage record keeping and documentation:

Title of procedure	Records and Documentation
Reference for procedure	GHG 08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Describes the method of retaining data in all forms

	Describes the location of records
	Lists the time for storage of records
	Describes public access to records
	Link to EQMS
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A
List of EN or other standards applied	N/A

oo. Risk Assessment

The results of a risk assessment that demonstrates that the control activities and procedures are commensurate with the risks identified:

Attachment	Description
Risk Assessment for GHG System_2014.pdf	Updated risk assessment

pp. Environmental Management System

Does your organisation have a documented Environmental Management System? Yes

Is the Environmental Management System certified by an accredited organisation? Yes

The standard to which the Environmental Management System is certified: ISO 14001

12. Changes in Operation

qq. Changes in Operation

Article 24(1) of Commission Decision 2011/278/EC requires that Member States must ensure that all relevant information about any planned or effective changes to the capacity activity level and operation of an installation is submitted by the operator to the competent authority by 31 December each year. Article 12(3) of the MRR further provides that Member States may require information to be included in the monitoring plan of an installation for the purposes of meeting these requirements.

Details of the procedure used to ensure regular reviews are carried out to identify any planned or effective changes to the capacity activity level and operation of the installation that have an impact on the installation's allocation:

The procedure specified below cover the following:

- planning and carrying out regular checks to determine whether any planned or effective changes to the capacity activity level and operation of an installation are relevant under Commission Decision 2011/278/EC; and
- Procedures to ensure such information is submitted to the competent authority by 31 December of each year.

Title of procedure	Changes in Operation and Reduction in Capacity
Reference for procedure	GHG 19
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The procedure describes how weekly and cumulative production figures are compared on the weekly stock sheet vs benchmark figures, to allow early identification of a change in activity level. It describes the quarterly checks, including the conversion to standard pure lime using lime analysis from a 17025 accredited laboratory. It describes notification to competent authority, including timeframes of change in activity level. Data is entered to 31st October each year by the responsible person to assess any change in Activity Level. If it is determined that there has been a change in capacity or activity level in that year, the NER template will be filled in by the responsible person and submitted by the Operator to the EPA by 31 December each year in accordance with Article 24(1) of the Commission Decision 2011/278/EC.
Post or department responsible for the procedure and for any data generated	Technical Manager
Location where records are kept	Technical Managers office (hardcopy) + Server (softcopy)
Name of IT system used	N/A

13. Abbreviations

rr. Abbreviations Acronyms or definitions

Abbreviations acronyms or definitions that have been used in this monitoring plan:

Abbreviation	Definition
N/A	N/A

14. Additional Information

Any other information:

Attachment	Description
TATT01-Loadcell uncertainty.pdf	Loadcell uncertainty
TATT02.pdf	Weighbridge range and tolerance
0518-01.pdf	Accreditation Scope for Andrew S. McCreath
netherlands_iso_17025.pdf	ISO17025 Accreditation for Incolab Services B.V.
L050-sce.pdf	Scope of accreditation for Incolab Services B.V.
Akkrediteringsurkunde-Anlage-englisch-2014.PDF	IKM Annex to ISO17025 Accreditation
Akkrediteringsurkunde-englisch-2014.PDF	IKM ISO17025 Accreditation

15. Confidentiality

ss. Confidentiality Statement

It is the Environmental Protection Agency's policy to make information received by it in the course of its work open to inspection by any person on request. This is in accordance with the provisions of the European Communities (Access to Information on the Environment) Regulations 2007 to 2011.

In the event that you considered that some of the information being submitted of a confidential nature, then the nature of this information and the reasons why it should be considered confidential, with reference to the European Communities (Access to Information on the Environment) Regulations 2007 to 2011 and any amendments must be explicitly requested using the facility below. The Board of the Environmental Protection Agency will consider the requests and if the information can be deemed as confidential and necessary.

Notwithstanding any request for confidentiality, the Environmental Protection Agency explicitly reserves the right to release data to the Commission, including emissions and allocations to the public, on the basis that the data will be used for the purposes foreseen in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Please tick this box if you consider that any part of your form should be treated as commercially confidential/sensitive: ☐ false

END of Appendix I.

