AAC BLOCKS PROJECT BY MOHIT INDUSTRIES LIMITED

Document Prepared by EKI Energy Services Limited

Project title	AAC blocks project by Mohit Industries Limited
Project ID	1238
Monitoring period	01-September-2021 to 24-November-2022 (inclusive both days)
Original date of issue	28-March-2024 (is the date the monitoring report was completed following the completion of the audit)
Most recent date of issue	17-December-2025 (is the date on which the document was most recently submitted)
Version	05
VCS Standard Version	Version 4.7

Prepared by	Ankit Sethiya, Manager – Operations EKI Energy Services Limited ankit@enkingint.org, registry@enkingint.org

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Big Bloc Construction Limited (hereinafter referred to as BBCL or PP) has installed an autoclaved aerated concrete (AAC) blocks manufacturing unit of capacity 360,000 m^3/annum in Gujarat, India. The project activity involves setting up a new facility and is accordingly classified as a Greenfield project. The AAC blocks manufactured at the project plant would use waste material fly ash generated from thermal power plants as the primary raw material. The AAC blocks produced would replace conventional fired (baked) clay bricks as construction material.

The initial (registered) production capacity of the AAC block manufacturing plant was 300,000 cubic meter per annum which has been increased to 360,000 cubic meters per annum. To improve the efficiency of the plant, the plant's production capacity was increased to 360,000 cubic meter per annum, representing a 20% increase w.e.f 19-February-2021. This capacity enhancement was achieved without any major structural changes to the plant or a complete redesign. Instead, it was done through:

- Optimization of existing infrastructure: Making better use of the current resources and space.
- Integration of selected modular equipment, including:
    - Extended moulds parking area: Increasing the space for storing moulds, which likely helps in speeding up production cycles.
    - Installation of Variable Frequency Drives (VFDs) on all cranes: VFDs help in energy-efficient operation of cranes by controlling their speed, which improves operational flexibility and efficiency.
    - Modifications to the autoclave pipeline: Changes to the steam curing system (autoclave) that help enhance production without affecting the core setup.

Importantly, these upgrades did not involve significant changes to the overall plant layout or foundational systems such as the building structure, primary machinery, or major utilities. Despite the capacity enhancement, product quality, operational efficiency, and compliance with industry standards were maintained. The project proponent has sought an approval on the same the details of which is incorporated in section 3.2.2 of the monitoring report. The Project Proponent demonstrated additionality at the time of registration using the barrier analysis approach, specifically citing the barrier due to prevailing practice and limited market acceptability. Importantly, the plant has never achieved its annual production capacity, even after these enhancements, due to the continued presence of the market acceptability barrier. Therefore, the additionality remains unaffected.

Brick sector is a resource intensive and highly polluting sector. It is largely unorganised and has never really come on the radar of regulatory agencies. It is estimated that at present, around 75 per cent of the market constitutes of fired clay bricks. As per the information provided by All India Brick Manufacturer Association, there are around 121,000 registered kilns operational in the country. The production processes are manual and it is estimated that more than 15 million workers are employed in the production of bricks.

The specific energy demand for manufacturing AAC blocks is lower as compared to conventional clay bricks. The energy requirement for fired clay bricks manufactured in India is supplied predominantly by high carbon intensive fossil fuel sources. AAC blocks are manufactured by the

autoclaving process, which is less energy intensive as compared to the thermal baking process used for manufacturing of fired clay bricks. Thus, the project activity results in lower greenhouse gas emission as compared to the conventional clay bricks manufacturing process. The project is located in the Surat district of the Gujarat state of India.

The project activity started in 25-November-2012. In the current monitoring period (01-September-2021 to 24-November-2022) the project has reduced 42,373 tCO_2 (ER estimation done considering the production capacity of 300,000 m^3/annum).

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation/ verification	25-November-2012 to 24-November-2022	VCS	SGS United Kingdom Limited	10 years
Verification	25-November-2012 to 31-December-2014	VCS	Earthood Services Private Limited	2 years 1 month 7 days
Verification	01-January-2015 to 31-August-2017	VCS	Earthood Services Pvt. Ltd.	2 years 08 months
Verification	01-September-2017 to 31-December-2020	VCS	KBS Certification Services Pvt. Ltd.	3 years 4 months
Verification	01-January-2021 to 31-August-2021	VCS	KBS Certification Services Pvt. Ltd	8 months
Verification	01-September-2021 to 24-November-2022	VCS	RINA	1 year 2 months 24 days
Total	25-November-2012 to 24-November-2022	-	-	Validation – 10 years, Verification - 10 years

1.3 Sectoral Scope and Project Type

Sectoral scope[1]	4: Manufacturing industries

[1] Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes

Project activity type	Other project activities, Fuel switch, process improvement and energy efficiency in brick manufacture

Methodology: AMS-III.Z: Fuel Switch, process improvement and energy efficiency in brick manufacture (Version 04)[2].

1.4 Project Proponent

Organization name	Big Bloc Construction Limited
Contact person	Mr. Manish Narayan Saboo
Title	Director
Address	A/601-B, International Trade Centre, Majura Gate, Ring Road, Surat, Gujarat, 395 002, India
Telephone	+91 261 2463261
Email	Manishsaboo84@gmail.com

1.5 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the project	Project Consultant
Contact person	Ankit Sethiya
Title	Manager – Operations
Address	Office No. 201, Plot 48, Scheme 78, Part 2, Vijay Nagar, Indore-452010 Madhya Pradesh, India
Telephone	0731 428 9086
Email	ankit@enkingint.org, registry@enkingint.org

1.6 Project Start Date

Project start date	25-November-2012

[2] https://cdm.unfccc.int/methodologies/DB/WPNWYRJ0FN59EFPA4A7NABU0849FD3

Justification	The start date of the project activity is 25-November-2012 which corresponds to the first production start date of the NXTBLOCK Autoclaved Aerated Concrete Block.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)[3]
Start and end date of first or fixed crediting period	1st Crediting Period: 25-November-2012 to 24-November-2022 (10 years twice renewable)

1.8 Project Location

The Project Activity is located in Village- Khatalwada, Tehsil - Umargaon in Valsad District of Gujarat. The details of the project locations are mentioned in the below -

Name of SPVs	Capacity	State
Big Bloc Construction Limited	360,000 m^3/annum	Gujarat

Geographical coordinates of the project location:

Latitude: 20.217° N

Longitude: 72.794°E

Nearest railway station: Surat

Nearest airport: Surat

Indicative map:

[3] Project activity is registered with VCS Standard 3.4 and in VCS Standard 4.0 a fixed crediting period of 10 years is introduced; deviation has been submitted to VERRA for 10 years crediting period renewable twice and it is been approved by VERRA on 15-September-2021. Ref. email communication by Matt Borden (mborden@verra.org) dated 15-September-2021.

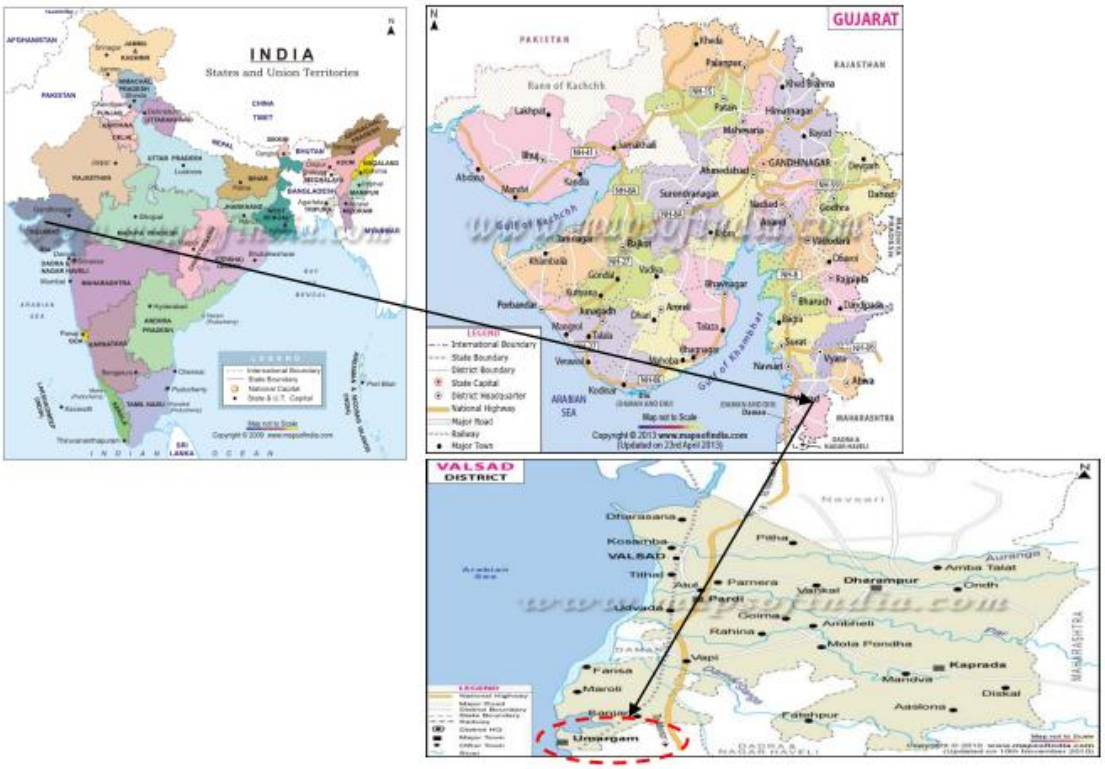

Figure 1. Satellite image of project activity

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	AMS-III.Z	Fuel Switch, process improvement and energy efficiency in brick manufacture	04[4]
Tool	EB 41 Report Annex 11	Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion	02[5]
Tool	EB 39 Report Annex 7	Tool to calculate baseline, project and /or leakage emission from electricity consumption	01[6]
Tool	EB 41 Report Annex 15	Tool for the identification of degraded or degrading lands for consideration in implementing CDM A/R project activities	01[7]

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Is the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

[4] https://cdm.unfccc.int/methodologies/DB/WPNWYRJ0FN59EFPA4A7NABU0849FD3

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf

[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf

[7] https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-13-v1.pdf

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

The Project Proponent has established robust measures to ensure that the emission reductions associated with the use of low-carbon bricks are not double counted by consumers in their carbon inventories or product footprint claims. Additionally, the Project Proponent has submitted a double counting declaration letter to prevent any risk of double counting related to this project activity. The project proponent has now included the statement at the official company website[8] as required by the section 3.24.7 of the VCS standard, Version 4.7. The statement says, "Carbon credits may be issued through Verified Carbon Standard project VCS 1238 for the greenhouse gas emission reductions or removals associated with Big Bloc Construction Limited, Fired clay brick."

1.12 Sustainable Development Contributions

Ministry of Environment, Forest and Climate Change (MoEF&CC), India's Designated National Authority (DNA) for CDM projects has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. During the current monitoring period, the project has contributed to sustainable development through the following ways.

Social well-being: The project activity has resulted in creating job opportunities for the local population operation of the renewable energy projects. This would result in the improvement in living standards of the local community.

Economic: The project leads to employment generation, both during construction as well as operational stage leading to overall upliftment of the economic status of the local area.

Technological: The project being a non-conventional project which leads to adoption of a new technology in the country. Such projects encourage further R&D and enhancement/viability for various other players to study and further refine the technology available.

[8] https://bigbloc.in/environment/

The SDG's considered for the present monitoring period are -

SDG 4.0: 4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill

SDG 12: 12.5.1 National recycling rate, tons of material recycled

SDG 13: 13.2.2 Total greenhouse gas emissions per year

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	4.0	4.4.1: Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	Implemented activities to increase	The Project organize minimum 01 training/year for the staff on the technology, the monitoring of the plant operation, and the emergency and safety procedures.	Overall, 15 trainings are provided since project commissioning.
2)	12.0	12.5.1: National recycling rate, tons of material recycled	Implemented activities to increase	The project uses fly ash which is a waste material from industries. During the period almost 174,904.37 MT of fly ash was used to make AAC blocks.	Overall, the project has used 1,434,221.6 (145,781.90+543,205.15+465,527.47+104,802.71 + 174,904.37) MT of fly ash which could have been dumped with no usage while increasing atmospheric pollution.
3)	13.0	13.2.2: Total greenhouse gas emissions per year	Implemented activities to increase	The project, in the current reporting period has resulted in emission reduction of 42,373 tCO_2e into the atmosphere. (ER estimation done considering the production capacity of 300,000 m^3).	Overall prevented the release of 408,633 (61,671+122,954+181,635+42,373) tCO_2e into the atmosphere since project commissioning.

1.13 Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Ongoing Stakeholder Consultation: During the current monitoring period, the PP has kept grievance register in plant site office seeking complaints/grievances from local community. Outcome: During the current monitoring period, no negative comments are received from the local stakeholders. Thus, no mitigations have been applied.

Stakeholder Identification	The various stakeholders identified for the project activity were notified and the necessary consents and approvals were obtained. This was done at various levels. A public notice was issued by the Big Bloc Construction Limited management at site opinion regarding the project activity was also sought from Employees. The following stakeholders were present: - 1. Employees 2. Local people
Legal or customary tenure/access rights	Not Applicable
Stakeholder diversity and changes over time	Stakeholders identified for this project activity are diverse in nature – in terms of socio-economic status, age and gender wise and the diversity is unlikely to change over time.
Expected changes in well-being	Expected changes 1. Economic well-being – the project activity is likely to provide employments to the locality thus economic well beings are expected 2. Environmental well-being – as this project activity reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions and specific pollutants

	like SOx, NOx, and SPM associated with the conventional thermal power generation facilities.
Location of stakeholders	Location of stakeholders Village: Malkhet, Dist: Valsad, State: Gujarat
Location of resources	Not Applicable

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	Stakeholders consultation is a continuous process and hence a feedback register is kept at the project site office where any stakeholder can come and share his/her feedback. The feedback irrespective of the type is taken care by PP with utmost priority.
Date(s) of stakeholder consultation	23-Septmber-2013
Communication of monitored results	The meeting was outlined towards making aware local stakeholders including local community, local administration representatives, NGOs working for environmental cause etc., about the project activity that involves electricity generation using biogas produced by treating poultry litter with the primary objective of reducing emissions of GHGs in compared to pre-project or baseline scenario. The feedbacks/comments received from stakeholders were quite positive and no negative comments were received. The questions asked by stakeholders were only on process and these ere explained by PP representatives.
Consultation records	Grievance register
Stakeholder input	The feedbacks/comments received from stakeholders were quite positive and no negative comments were received. The questions asked by stakeholders were only on process and these ere explained by PP representatives.

2.1.3 Free, Prior, and Informed Consent

Consent	Not Applicable
Outcome of FPIC	Not Applicable

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
There has been no grievance received for the current monitoring period	Not Applicable

2.1.5 Public Comments

Summary of comments received	Actions taken
No comments received in this current monitoring period.	No comments

2.2 Risks to Stakeholders and the Environment

	Risk identified	Mitigation or preventative measure taken
Risks to stakeholder participation	No risk to stakeholder participation is anticipated	No mitigation or preventive measure is required as no risk has been identified
Working conditions	The working condition of the factory workers could be affected if EHS measures are not taken.	A high priority on the wellbeing of our employees and r commitment to environmental sustainability is placed at the factory premises. The project proponent has proactively implemented various policies and measures to create a safe and healthy workplace while minimizing environmental impact. Through regular communication, training, and awareness programs, it is ensured that the employees fully understand and comply with our EHS (Environment, Health, and Safety).
Safety of women and girls	There could be sexual harassment to the women at the workplace.	In compliance of provisions of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 ("POSH Act") and Rules framed thereunder, the project proponent has formulated and implemented a policy on prevention, prohibition

		and redressal of complaints related to sexual harassment of women at the workplace.
Safety of minority and marginalized groups, including children	As per the Business Responsibility & Sustainability Report for the year, 2023-24[9] prepared by the project proponent, there is no vulnerable & marginalized Group stakeholder identified. So, there is no risk identified.	No mitigation measure is required.
Pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials)	AAC blocks embody sustainability with their natural, non-toxic origin and minimal waste generation during manufacturing. Utilizing fly ash, a byproduct of thermal power plants, as a key raw material, AAC blocks recycle coal waste, reducing environmental impact. Unlike conventional red clay bricks, AAC blocks do not rely on red soil, preventing deforestation and environmental degradation. AAC blocks contain two-third of their weight in fly ash, effectively sequestering carbon emissions. This is to be noted that the emission associated with the raw material production (including mining) is not in the control of the project proponent, the emission associated with the transportation is accounted in the leakage emission to calculation emission reduction from the project. Moreover, the same raw material and quantity, except fly ash would have also been consumed in the baseline scenario in producing the fire clay brick. As mentioned above, the by switching to fly ash from red clay as a raw material for brick production, the project contributes to sustainable	No mitigation measure is required.

[9] https://bigbloc.in/wp-content/uploads/2025/01/BigBloc_AR2024.pdf

	development. So, no risk is identified in the regard.	

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Discrimination and sexual harassment	PP confirmed that there is no discrimination or sexual harassment occurs at workplace & PP created a workplace that is free of sexual harassment and discrimination by following the act "THE SEXUAL HARASSMENT OF WOMEN AT WORKPLACE (PREVENTION, PROHIBITION AND REDRESSAL) ACT, 2013[10]" stipulated by host country (India) government.
Management experience	The PP has a proficient management team for the seamless operation of the project activity. The team consists of the members, having expertise in their relevant fields and who work closely with local communities and government agencies.
Gender equity in labor and work	PP has provided a declaration stating its commitment to non-discrimination based on gender in job opportunities and wage distribution among workers. The project proponent will showcase adherence to this commitment during the current verification process.
Human trafficking, forced labor, and child labor	PP has confirmed that project activity does not use victims of human trafficking, forced labor, and child labor during the current verification process.

2.3.2 Human Rights

The following preventative measure by the PP has been taken for how the project is committed to safeguard the rights of IPs, LCs, and customary right holders, while following the international human rights law , the UNDRIP and ILO Convention 169- Free, Prior, and Informed Consent (FPIC): The project activity has obtained the FPIC from the local stakeholders including the IPs, LCs and customary right holders, ensuring their unforced consent before the project operation, respecting their right to make decisions.

Non-discriminatory Participation in the Project Activity- The project emphasizes non-discriminatory participation, ensuring that the distribution of devices or benefits from the project does not discriminate against IPs, LCs, or customary right holders on the basis of cultural, social, or other grounds. This measure guarantees that all stakeholders have equal access and opportunity, in alignment with their rights to participate in social, economic, and cultural activities without discrimination, as recognized by international human rights frameworks. Employment due to the Project Activity- The project activity also leads to the employment from the IPs, LCs

[10] https://doe.gov.in/files/inline-documents/DoE_Prevention_sexual_harassment.pdf

and customary right holders, enabling them to exercise their right to fair treatment in employment and salary.

2.3.3 Indigenous Peoples and Cultural Heritage

The project activity does not impact the tangible or intangible cultural heritage or the indigenous people nearby.

2.3.4 Property Rights

Disputes over rights to territories and resources	Not Applicable
Respect for property rights	Not Applicable

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	Not Applicable
Benefit sharing during the monitoring period	Not Applicable

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	No impact on biodiversity is likely to be caused
Soil degradation and soil erosion	No risk identified	No soil erosion and degradation are likely to be caused
Water consumption and stress	No risk identified	Water consumption will be of moderate level and hence stress is likely to be caused
Usage of fertilizers	No risk identified	No fertilized is used

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	Not Applicable

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Existing invasive species	Mitigation measures to prevent spread or continued existence of invasive species
Not Applicable	Not Applicable

2.4.3 Ecosystem conversion

Not Applicable

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity started in 25-November-2012. In this monitoring period, the project reduced 42,373 tCO_2e (ER estimation done considering the production capacity of 300,000 m^3).

The major components of equipment installed as part of project activity are as follows:

- Raw materials storage silos
- Raw material mixer
- Hydraulically operated molding section
- Autoclave section
- Steam boilers
- Compressed air network
- Internal transportation system

Specifications of AAC blocks manufactured under the project activity are as follows:

Particulars	Unit	Value	Remark (if any)
Dimension of AAC blocks	Mm	650X240X150	As per actual production data
Density (dry)	kg/m^3	551-600	As per Lab test Report
Dry shrinkage (maximum)	%	0.1	As per Indian Standard–IS 2185
Thermal conductivity	W/m-K	0.24	
Compressive strength	N/mm^2	>3.75	
Fly ash	%	72.11	Lab test report and actual monitoring data at the plant
Cement	%	18.37	
Lime	%	7.38	
Gypsum	%	2.06	
Aluminum powder	%	0.064	

3.2 Deviations

3.2.1 Methodology Deviations

There are no methodology deviations in the project activity.

3.2.2 Project Description Deviations

The deviations approved in the previous verification only; the deviation is as follows;

1. Measurement of Raw Material Consumption (using Weigh- Bridge)

   The details of the weigh-bridge used for monitoring the consumption of raw material were missing in the registered VCS PD and has been added. Additionally, the calibration frequency has been set as once in a year.

2. The parameters $D_{f,y}$ & $FR_{f,m}$ has been used to compute the leakage emissions.

   The purpose of monitoring of parameter "Return trip road distance between the origin and destination of freight transportation activity f" ($D_{f,y}$) and "Total mass of freight transported in freight transportation activity f" ($FR_{f,m}$) was given as project emission in the registered PD. However, it has been changed to mention leakage emission in line to the applied methodology.

3. The project has added monitoring for the parameter of Diesel Consumption considering the usage of DG sets at site in case of emergency or grid failures. The addition of parameter is based on the conservativeness of project emission calculations.
4. PP name i.e. Mohit Industries Limited is changed to Big Bloc Construction Limited[11] in 01-April-2015.
5. Change in Meter and Accuracy class:

Old Energy Meter (L&T Make)	Serial No: 11490797	Accuracy class: 0.55 for Active, 1.05 for Reactive
Energy Meter (L&T Make)	Serial No: 09512220	Accuracy class: 0.5 for Active, 1.0 for Reactive

6. The calibration frequency of the energy meters installed at the project site will be conducted once in five years[12].

The deviation applied in the current monitoring period (01-September-2021 to 24-November-2022):

Deviation 1

[11] https://www.mohitindustries.com/pages/history/

[12] https://www.cbip.org/MIR/1%20DATA/CEA%201.pdf

Project activity is registered with VCS Standard 3.4 and in VCS Standard 4.0 a fixed crediting period of 10 years is introduced; deviation has been submitted to VERRA for 10 years crediting period renewable twice and it is been approved by VERRA on 15-September-2021. Ref. email communication by Matt Borden (mborden@verra.org) dated 15-September-2021.

This deviation has been of permanent nature. There is no impact on project baseline and additionality w.r.t. this deviation.

Deviation 2
The initial (registered) production capacity of the AAC block manufacturing plant was 300,000 cubic meter per annum which has been increased to 360,000 cubic meters per annum w.e.f 19-February-2021. The project proponent does not propose to claim the emission reduction for the additional capacity. To account the emission reduction from the original capacity of 300,000 cubic meter per annum, the project proponent has apportioned the production based on the actual PLF realized in the monitoring period (with 360,000 cubic meter per annum capacity). The monthly PLF values calculated based on 360,000 cubic meter per annum are applied with the original capacity as per registered PD, 300,000 cubic meter per annum.

This should be noted that while calculating the monthly PLF based on the increased capacity, i.e. 360,000 cubic meter per annum, in some of the months the monthly PLF value has been gone up to close to 100%. As the PLF is calculated by considering the monthly calculated capacity, 30,000 cubic meter (360,000/12). However, the annual average PLF has been calculated to be less (87% for Sep-2021 to Aug-2022 and 69% for Sep-2022 to Nov-2022). Hence, the same should be acceptable.

The increased production capacity of the plant does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology even after the capacity enhancement. The additionality of the project was demonstrated using the barrier analysis at the time of project registration, and the identified barrier remain applicable to the project activity as on date. Around 75 per cent of the total walling material market is still dominated by fired clay bricks[13]. Also, the solid burnt clay bricks hold the largest production share of about 89%[14]. Hence, the financial impact due to the change in production capacity would not put any impact of additionality of the project.
The plant capacity has been enhanced from 300,000 cubic meters per annum to 360,000 cubic meters per annum. While the consumables calculation is based on this enhanced capacity; however, the emission reduction is conservative, reflecting the previous production level of 300,000 cubic meters per annum.

Deviation 3
The Diesel is consumed for auxiliary operations by machinery and equipment used in the project activity, such as forklifts, JCBs, and other similar equipment.

[13] https://www.cseindia.org/fly-ash-8622#:~:text=Building%20construction%20in%20India%20is%20estimated%20to,the%20best%20alternative%20to%20replace%20red%20bricks

[14] https://shaktifoundation.in/wp-content/uploads/2018/04/Roadmap-for-promoting-Resource-Efficient-Bricks-in-India-Summary-report.pdf

3.3 Grouped Projects

The project is not a grouped project activity.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF_{BL}
Data unit	tCO_2/m^3
Description	The annual production specific baseline emission factor
Source of data	Calculated based on data taken from: 1. "Brick and ceramic sectors" report by Asian Institute of Technology[15] 2. "Energy Conservation and Pollution Control in brick kilns" report by Sameer Maithel, N Vasudevan, Lt. Col. Rakesh Joshi (Retrd.)[16] 3. Density of bricks taken from www.reade.com[17]
Value applied	0.3993
Justification of choice of data or description of measurement methods and procedures applied	The value is a calculated value. It has been derived based on CO_2 emission per brick data taken from "Brick and ceramic sector report", which has been converted to CO_2 emission per unit volume of baseline brick with weight of each brick taken from "Energy conservation and Pollution Control in brick kilns" report and density of each brick from the engineering tool box. Values

[15] http://www.faculty.ait.ac.th/visu/Prof%20Visu's%20CV/Books%20and%20research%20reports/BRICK%20AND%20CERAMIC.pdf

[16] http://www.cosmile.org/papers/brick_statuspaperVSBKsindia2003.pdf

[17] http://www.reade.com/Particle_Briefings/spec_gra2.html

	used are such that conservativeness of baseline emission factor is ensured.
Purpose of data	This value has been used to baseline emissions
Comments	-

Data / Parameter	$COEF_{cement}$
Data unit	tCO_2e/kt
Description	CO_2 emission factor of cement production
Source of data	Cement Sustainability Initiative (CSI)- The Cement CO_2 and Energy Protocol[18]. CO_2 and Energy Accounting and Reporting Standard for the Cement Industry (May 2011) by WBCSD- Version 3.0
Value applied	0.638×10^3
Justification of choice of data or description of measurement methods and procedures applied	This value is a default value as per Cement Sustainability Initiative protocol and is an authentic source of data
Purpose of data	Leakage emissions calculation
Comments	-

Data / Parameter	$COEF_{aluminium}$
Data unit	tCO_2/kt
Description	CO_2 emission factor of aluminium production
Source of data	IPCC 2006 Report Volume 3 Chapter 1 for Soderberg Smelting Technology
Value applied	1.7×10^3
Justification of choice of data or description of measurement methods and procedures applied	IPCC Report is an authentic source of data. Further, for leakage emission more emission intensive of the two available technologies (Prebake and Soderberg) for aluminium production is taken for conservativeness.
Purpose of data	Leakage emissions calculation
Comments	-

Data / Parameter	$COEF_{lime}$
Data unit	tCO_2/kt

[18] http://www.wbcsdcement.org/pdf/tf1_co2%20protocol%20v3.pdf

Description	CO_2 emission factor of lime production
Source of data	IPCC Guidelines 2006 for NGGI (Vol 3 Ch 2 Eqn 2.8)
Value applied	$0.75x10^3$
Justification of choice of data or description of measurement methods and procedures applied	IPCC 2006 data is an authentic source of data
Purpose of data	Leakage emissions calculation
Comments	This value is fixed ex-ante

Data / Parameter	$COEF_{gypsum}$
Data unit	tCO_2/t
Description	CO_2 emission factor of gypsum production
Source of data	Methodology for free allocation of emission allowances in the EU ETS post 2012[19]
Value applied	0.01[20]
Justification of choice of data or description of measurement methods and procedures applied	EU ETS data is an authentic source of data
Purpose of data	Leakage emissions calculation
Comments	This value is fixed ex-ante

Data / Parameter	$EF_{CO2,f}$
Data unit	$gCO_2/t\text{-}km$
Description	Default CO_2 emission factor for freight transportation activity f
Source of data	Default value as provided in the methodological tool to calculate "Project and leakage emissions from road transportation of freight" version 01.1.0[21]
Value applied	Light vehicles – 245 Heavy vehicles – 129

[19] http://ec.europa.eu/clima/policies/ets/cap/allocation/docs/bm_study-gypsum_en.pdf

[20] With reference to the source of data (Methodology for the free allocation of emission allowances in the EU ETS post 2012-Sector report for the gypsum industry), the value has been given as 0.01 tCO2/tonne.

[21] Project and leakage emissions from transportation of freight https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-12-v1.1.0.pdf

Justification of choice of data or description of measurement methods and procedures applied	This is a default data as provided by UNFCCC and is an authentic source of data. During the current monitoring period following types of vehicles were used for the different raw material transported.

Raw Material	Type of vehicle used
Cement	Heavy
Fly ash	Heavy
Lime	Heavy
Gypsum	Light
Aluminium poder	Light
Coal	Heavy

Purpose of data	Leakage emissions calculation
Comments	The values are default values as provided by UNFCCC tool.

Data / Parameter	D_{brick}
Data unit	Kg/m^3
Description	Density of each baseline brick produced
Source of data	Density of common clay bricks taken from www.reade.com[22]
Value applied	1920
Justification of choice of data or description of measurement methods and procedures applied	This data has been taken from public domain (www.reade.com).
Purpose of data	Baseline emissions calculation
Comments	The source of data is a third party publicly available source. The value can also be cross-checked from the following source http://www.simetric.co.uk/si_materials.htm

Data / Parameter	W_{brick}
Data unit	Kg
Description	Weight of each baseline brick produced
Source of data	Section 3.0-page 3/29 of the report: "Energy Conservation and Pollution Control in brick kilns" report by Sameer Maithel, N Vasudevan, Lt. Col. Rakesh Joshi (Retrd.)[23]

[22] http://www.reade.com/Particle_Briefings/spec_gra2.html

[23] http://www.cosmile.org/papers/brick_energyconservationpollutioncontrol.pdf

Value applied	3.75
Justification of choice of data or description of measurement methods and procedures applied	Higher value of the range of weight provided is chosen for conservativeness. The source of data chosen is an authentic 3rd party source.
Purpose of data	Baseline emissions calculation
Comments	http://www.reade.com/Particle_Briefings/spec_gra2.html http://www.cosmile.org/papers/brick_energyconservationpollutioncontrol.pdf Both the websites are authentic sources of data

Data / Parameter	$EF_{CO2,brick}$
Data unit	$kgCO_2$/brick
Description	CO_2 emission per baseline brick produced
Source of data	Page # 25 of the "Brick and ceramic sectors" report by Asian Institute of Technology[24]
Value applied	0.78
Justification of choice of data or description of measurement methods and procedures applied	Lower value of the range of CO_2 emission per brick provided is chosen for conservativeness. The source of data chosen is an authentic 3rd party source.
Purpose of data	Baseline emissions calculation
Comments	Report by the "Brick and ceramic sectors" is an authentic source of data

Data / Parameter	$EF_{EL,plant,y}$
Data unit	tCO_2/MWh
Description	Emission factor for electricity used in project plant in year y
Source of data	Tool to calculate baseline, project and/or leakage emission from electricity consumption, version no. 1
Value applied	1.3
Justification of choice of data or description of	Higher of the CO_2 emission factor for captive source (DG set) or the regional grid. Emission factor data for captive source taken from Tool to calculate baseline, project and/or leakage emission

[24] http://www.faculty.ait.ac.th/visu/Prof%20Visu's%20CV/Books%20and%20research%20reports/BRICK%20AND%20CERAMIC.pdf

measurement methods and procedures applied	from electricity consumption, version no. 1 and emission factor of NEWNE grid taken from CEA database Version 09.
Purpose of data	Project emissions calculation
Comments	Emission factor for CPP is taken as the default emission factor for project emission source as provided under option B.2 of the tool.

Data / Parameter	$TDL_{plant,y}$
Data unit	%
Description	Average technical transmission and distribution losses for providing electricity to project plant in year y
Source of data	Default value for project electricity source taken from Tool to calculate baseline, project and/or leakage emissions from electricity consumption, version 01[25].
Value applied	20
Justification of choice of data or description of measurement methods and procedures applied	Project emissions calculation
Purpose of data	The emission factor for project emission has been selected as the default transmission and distribution losses for project emission estimation applicable to scenario CIII. Data taken from "Tool to calculate baseline, project or leakage emission from electricity consumption", which is an authentic source.
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	Compressive strength of AAC blocks
Data unit	N/mm^2
Description	Compressive strength of project blocks
Source of data	Laboratory test report
Description of measurement methods and procedures to be applied	Dry compressive strength of the project block would be tested in nationally approved laboratory. Compressive strength test would be carried in line with IS code: 6441 Part V.

[25] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf (Version 01, EB 39, Annex 07, Date: 16-May-2008)

<table>
<tr><td>Frequency of monitoring/recording</td><td>Monitoring frequency: Once in every 6 months
Recording frequency: Once in every 6 months</td></tr>
<tr><td>Value monitored</td><td><table>
<tr><td>Report date</td><td>Compressive Strength</td></tr>
<tr><td></td><td>N/mm^2</td></tr>
<tr><td>18-September-2021</td><td>4.85</td></tr>
<tr><td>08-March-2022</td><td>4.51</td></tr>
<tr><td>05-September-2022</td><td>4.33</td></tr>
<tr><td>Avg.</td><td>4.56</td></tr>
</table></td></tr>
<tr><td>Monitoring equipment</td><td>Compressive strength was carried out in external laboratory</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>The laboratory would comply with relevant national standards.</td></tr>
<tr><td>Purpose of the data</td><td>Baseline Emissions</td></tr>
<tr><td>Calculation method</td><td>This is a measured data. Hence not applicable.</td></tr>
<tr><td>Comments</td><td>All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.</td></tr>
</table>

<table>
<tr><td>Data / Parameter</td><td>Density of AAC blocks</td></tr>
<tr><td>Data unit</td><td>kg/m^3</td></tr>
<tr><td>Description</td><td>Density of AAC blocks</td></tr>
<tr><td>Source of data</td><td>Laboratory test reports</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>Density of the project block would be tested and nationally approved laboratory. Density determination would be carried in line with IS code: 6441 Part I.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Monitoring frequency: Once in every 6 months
Recording frequency: Once in every 6 months</td></tr>
<tr><td>Value monitored</td><td><table>
<tr><td>Report date</td><td>Block density</td></tr>
<tr><td></td><td>kg/m^3</td></tr>
<tr><td>18-September-2021</td><td>567.00</td></tr>
<tr><td>08-March-2022</td><td>552.00</td></tr>
<tr><td>05-September-2022</td><td>590.00</td></tr>
<tr><td>Avg.</td><td>569.67</td></tr>
</table></td></tr>
</table>

Monitoring equipment	This test would be carried out at the laboratory (at MIL premises)
QA/QC procedures to be applied	The laboratory would comply with relevant national standards
Purpose of the data	Baseline emissions
Calculation method	Not Applicable. This is a measured data.
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$P_{PJ,y}$
Data unit	m^3
Description	The annual production of the facility in year y
Source of data	Plant Records – production log book data
Description of measurement methods and procedures to be applied	Number of standard sized cakes being manufactured is being monitored manually. Number of cakes manufactured can be converted to volume units using the standard volume for each cake.
Frequency of monitoring/recording	Monitoring frequency: Continuously Recording frequency: Daily
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>m^3</td><td>113,961.24</td><td>262,454.40</td></tr></table>
Monitoring equipment	Number of blocks produced is manually counted
QA/QC procedures to be applied	Blocks selling data and blocks stocks data can be used for verification of figures.
Purpose of the data	Baseline Emissions
Calculation method	Production = (Number of cakes) x (standard volume per cake)
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later

Data / Parameter	$FC_{coal,y}$
Data unit	Kt

Description	Quantity of coal combusted by the project activity boiler during the year y
Source of data	Plant records – Boiler room log book
Description of measurement methods and procedures to be applied	Quantity of coal consumed by the project activity boiler is a monitored source of data
Frequency of monitoring/recording	Monitoring frequency: Daily Recording frequency: Daily
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>kt</td><td>3.12</td><td>7.44</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour industries Pvt Ltd. Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	Coal stock records can be used. Quantity of coal purchased and coal inventory can be verified for the purpose.
Purpose of the data	Project Emissions
Calculation method	Coal stock records can be used. Quantity of coal purchased and coal inventory can be verified for the purpose. Quantity = Opening Stock + Purchases – Closing stock
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later

Data / Parameter	$NCV_{coal,y}$
Data unit	TJ/kt
Description	Weighted average net calorific value of coal in the year y
Source of data	IPCC 2006 Vol 2 Chapter 1[26]
Description of measurement methods	Higher value of the uncertainty range of IPCC default values as provided in Table 1.2 Vol 2 of the 2006 IPCC Guidelines. There is

[26] https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf#page=18

and procedures to be applied	no update of the NCV in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2[27].
Frequency of monitoring/recording	Monitoring frequency: Every update of IPCC Recording frequency: Annually
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>TJ/kt</td><td>26</td><td>26</td></tr></table>
Monitoring equipment	The value is taken from IPCC's publicly available report.
QA/QC procedures to be applied	IPCC data is an authentic source
Purpose of the data	Project Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later

Data / Parameter	$EF_{coal,y}$
Data unit	tCO_2e/TJ
Description	Weighted average CO_2 emission factor of coal in the year y
Source of data	Table 1.2 Vol 2 of the 2006 IPCC Guidelines[28]
Description of measurement methods and procedures to be applied	Higher value of the uncertainty range of IPCC default values as provided in Table 1.4 Vol 2 of the 2006 IPCC Guidelines. There is no update of the EF in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2[29].
Frequency of monitoring/recording	Monitoring frequency: Every update of IPCC Recording frequency: Annually
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>tCO_2e/TJ</td><td>100</td><td>100</td></tr></table>
Monitoring equipment	The value is taken from IPCC's publicly available report

[27] https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/2_Volume2/19R_V2_1_Ch01_Introduction.pdf

[28] https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf#page=23

[29] https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/2_Volume2/19R_V2_2_Ch02_Stationary_Combustion.pdf

QA/QC procedures to be applied	IPCC data is an authentic source
Purpose of the data	Project Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$EC_{PJ,y}$
Data unit	MWh
Description	Quantity of electricity consumed by the project plant in year y
Source of data	Plant records – Electricity consumption logbook
Description of measurement methods and procedures to be applied	Separate electricity meter would be installed for monitoring of electricity imported from state grid and electricity generated by captive diesel generator sets. Electricity consumption of the plant would be calculated as summation of the electricity imports from state grid and electricity generated by captive diesel generator sets.
Frequency of monitoring/recording	Monitoring frequency: Continuously Recording frequency: Daily
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>MWh/yr</td><td>642.21</td><td>1,775.90</td></tr></table>
Monitoring equipment	Equipment: Energy Meter or Electricity Consumption Meter (main power supply) Manufacturer: L& T- Electronic trivector ER-300 P Serial #: 11490797 Accuracy class: 0.55 for Active, 1.05 for Reactive
QA/QC procedures to be applied	The electricity meters would be calibrated at least once in a year by internal/external agency. The electricity consumption data from grid can be cross verified from electricity purchase invoice. The calibration details are mentioned in Section 4.3 of the MR.
Purpose of the data	Project Emissions
Calculation method	Not Applicable. This is a directly measured parameter
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMP_{cement,y}$
Data unit	kT
Description	Quantity of cement purchased for producing AAC in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weigh bridge installed at plant
Frequency of monitoring/recording	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>T</td><td>12,303.03</td><td>28,853.06</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour industries Pvt. Ltd. Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	Weigh bridge would be calibrated at least annually by internal/external agency. Purchase data can be cross verified with raw material purchase invoice is a 3rd party data.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMC_{cement,y}$
Data unit	kT
Description	Quantity of cement consumed for producing AAC blocks in the year y
Source of data	Plant records

Description of measurement methods and procedures to be applied	Weighbridge installed at cement batcher inlet
Frequency of monitoring/recording	Monitoring frequency: Batch wise Recording frequency: Daily
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>T</td><td>12,237.29</td><td>28,230.57</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	The Weighbridge would be calibrated at least annually. Cement purchase invoices and cement stocks data can be used for verification of figures
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMP_{fly\ ash,y}$
Data unit	Kt
Description	Quantity of fly ash purchased for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weigh bridge installed at plant
Frequency of monitoring/recording	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly

Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>t</td><td>426,786.04</td><td>1,376,518.12</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour industries Pvt. Ltd. Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	Weighbridge would be calibrated at least annually by internal/external agency. Purchase data can be cross verified with raw material purchase invoice is a 3rd party data.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMC_{fly\ ash,y}$
Data unit	Kt
Description	Quantity of fly ash consumed for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weighbridge installed at fly ash batcher inlet
Frequency of monitoring/recording	Monitoring frequency: Batch wise Recording frequency: Daily
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>t</td><td>63,018.42</td><td>144,849.19</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour Serial #: 09201718

	Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	The Weighbridge would be calibrated at least annually. Fly ash purchase invoices and fly ash stocks data can be used for verification of figures.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMP_{Lime,y}$
Data unit	Kt
Description	Quantity of lime purchased for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weigh bridge installed at plant
Frequency of monitoring/recording	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>t</td><td>4,749.84</td><td>11,211.69</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour industries Pvt. Ltd. Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	Weigh bridge would be calibrated at least annually by internal/external agency. Purchase data can be cross verified with raw material purchase invoice is a 3rd party data.
Purpose of the data	Leakage Emissions

Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMC_{Lime,y}$
Data unit	Kt
Description	Quantity of lime consumed for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weighbridge installed at lime batcher inlet
Frequency of monitoring/recording	Monitoring frequency: Batch wise Recording frequency: Daily
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>t</td><td>4,640.87</td><td>10,662.68</td></tr></table>
Monitoring equipment	Equipment: Weigh Bridge Manufacturer: Endeavour Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	The Weighbridge would be calibrated at least annually. Lime purchase invoices and lime stocks data can be used for verification of figures.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMP_{gypsum,y}$
Data unit	Kt

Description	Quantity of gypsum purchased for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weigh bridge installed at plant
Frequency of monitoring/recording	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>t</td><td>367.63</td><td>1068.95</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour industries Pvt. Ltd. Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	The Weighbridge would be calibrated at least annually Lime purchase invoices and lime stocks data can be used for verification of figures.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMC_{gypsum,y}$
Data unit	Quantity of gypsum consumed for producing AAC blocks in the year y
Description	Plant records – purchase book
Source of data	Weighbridge installed at lime batcher inlet
Description of measurement methods and procedures to be applied	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly

Frequency of monitoring/recording	Quantity of gypsum consumed for producing AAC blocks in the year y
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>t</td><td>391.96</td><td>956.18</td></tr></table>
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	The Weighbridge would be calibrated at least annually. Gypsum purchase invoices and gypsum stocks data can be used for verification of figures
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMP_{aluminium,y}$
Data unit	Kt
Description	Quantity of aluminium purchased for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weigh bridge installed at plant
Frequency of monitoring/recording	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr></table>

	t | 64.20 | 116.16
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour industries Pvt. Ltd. Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	Weighbridge would be calibrated at least annually by internal/external agency. Purchase data can be cross verified with raw material purchase invoice is a 3rd party data.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$RMC_{aluminium,y}$
Data unit	Kt
Description	Quantity of aluminium consumed for producing AAC blocks in the year y
Source of data	Plant records – purchase book
Description of measurement methods and procedures to be applied	Weighbridge installed at lime batcher inlet
Frequency of monitoring/recording	Monitoring frequency: Every purchase of raw material Recording frequency: Monthly
Value monitored	01-September-2021 to 31-December-2021 | 01-January-2022 to 24-November-2022 t | 50.34 | 113.05
Monitoring equipment	Equipment: Weighbridge Manufacturer: Endeavour

	Serial #: 09201718 Accuracy class: III Calibration date 1: 22-September-2019 Calibration date 2: 09-September-2020 Calibration date 3: 24-November-2021
QA/QC procedures to be applied	The Weighbridge would be calibrated at least annually. Aluminium powder purchase invoices and aluminium powder stocks data can be used for verification of figures.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$D_{f,y}$
Data unit	Km
Description	Return trip road distance between the origin and destination of freight transportation activity f in monitoring period m
Source of data	Purchase Records
Description of measurement methods and procedures to be applied	Determined once ex-ante for each freight transportation activity f for a reference trip (actual purchase invoices) and using online map sources.
Frequency of monitoring/recording	Monitoring frequency: Whenever Road trip distance changes Recording frequency: Whenever Road trip distance changes
Value monitored	

Raw Material	Round trip distance
Cement[30]	139
Fly ash[31]	43
Lime[32]	980
Gypsum[33]	603
Aluminium poder[34]	894

[30] Surat to Project site
[31] Dahanu to project site
[32] Jodhpur to project site
[33] Morbi Rajkot to project site
[34] Nagpur to project site

	Coal[35] 709
Monitoring equipment	Purchase invoices and online maps are 3rd party applications
QA/QC procedures to be applied	The data is a 3rd party data.
Purpose of the data	Project Emissions
Calculation method	Roundtrip road travel distances calculated from online maps
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$FR_{f,m}$
Data unit	Tonne
Description	Total mass of freight transported in freight transportation activity f in monitoring period m
Source of data	Purchase records
Description of measurement methods and procedures to be applied	Raw material purchase and consumption will be monitored by type
Frequency of monitoring/recording	Monitoring frequency: Continuously Recording frequency: Monthly
Value monitored	
Monitoring equipment	Purchase invoices are 3rd party documents
QA/QC procedures to be applied	The data is a 3rd party data.
Purpose of the data	Project Emissions
Calculation method	Not Applicable

Parameters	Unit	Year 2021	Year 2022
FR_{cement}	t	12,303.03	28,853.06
FR_{Flyash}	t	426,786.04	13,76,518.12
FR_{lime}	t	4,749.84	11,211.69
FR_{Gypsum}	t	367.63	1068.95
$FR_{Al.\ Powder}$	t	64.20	116.16
FR_{coal}	t	2,505.62	7,599.22

[35] Mumbai port to project site

Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	The vehicle class used
Data unit	-
Description	The vehicle class used for freight transportation
Source of data	Transportation records
Description of measurement methods and procedures to be applied	Vehicle type (light/heavy) used for raw material transportation will be monitored based on road challan for raw material transported during each transportation activity.
Frequency of monitoring/recording	Monitoring frequency: Continuously Recording frequency: Every receipt of raw materials at site
Value monitored	-
Monitoring equipment	Way bill and UNFCCC guidelines[36] are 3rd party sources of data
QA/QC procedures to be applied	The data is a 3rd party data. The value can be further confirmed with the weigh bridge slip generated for raw materials inward quantity.
Purpose of the data	Leakage Emissions
Calculation method	Not Applicable
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

Data / Parameter	$D_{G,y}$
Data unit	Litre
Description	Quantity of Diesel consumed in the plant in the year y
Source of data	Consumption Records
Description of measurement methods and procedures to be applied	Quantities of diesel consumed are monitored based on diesel consumed and filled in the DG set

[36] Project and leakage emissions from transportation of freight (EB70, Annex23, Version 01.1.0, Tool 12) http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-12-v1.1.0.pdf

Frequency of monitoring/recording	Monitoring frequency: Batch wise Recording frequency: Monthly
Value monitored	<table><tr><td></td><td>01-September-2021 to 31-December-2021</td><td>01-January-2022 to 24-November-2022</td></tr><tr><td>Litre</td><td>15,000</td><td>27,950</td></tr></table>
Monitoring equipment	Measuring can / Drums are used to fill diesel
QA/QC procedures to be applied	Purchase invoices have also been used to cross verify the total diesel purchase from 3rd party data.
Purpose of the data	Project Emissions
Calculation method	This is a measured parameter.
Comments	All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later.

4.3 Monitoring Plan

The monitoring plan involves structure for:

- Monitoring, recording and archiving of all data required for calculation of ex-post emission reduction from the project.
- Storing documents required for emission reduction calculations.
- Conducting/arranging calibration tests for monitoring equipment
- Ensuring quality of recorded data
- Co-ordinating with consultants and auditors to submit monitored data to VCS Board.

The monitoring team will be structured as follows:

Position	Report to
Operators	Plant head
Supervisor managers (technical/maintenance)	
VCS monitoring project manager	

Detailed responsibility of each member in the monitoring team is provided below:

#	Tasks description	Operator(s)	Supervisor	Plant Manager	VCS monitoring

					project manager
Monitoring activity					
1	Recording of monitored data	✓	✓		
Quality Assurance & Quality Control					
2	Verification of data monitored (consistency and completeness)		✓	✓	
3	Ensuring adequate training of staff			✓	✓
4	Ensuring adequate maintenance		✓	✓	✓
5	Ensuring calibration of monitoring instruments		✓	✓	✓
6	Data archiving: ensuring adequate storage of data monitored (integrity and backup)			✓	✓
7	Identification of non-conformance and corrective/preventive actions and monitoring plan improvement			✓	✓
8	Emergency procedures		✓	✓	
Calculation of GHG emission reductions and reporting					
9	Processing of data and calculation of emission reductions				✓
10	Monitoring report: management review			✓	✓

	of monitoring report (internal audit)				

All data would be collected in paper log books and/or online data collection system and would be converted to spreadsheet form on an annual basis. The quality of data would be ensured by periodic verification of data by VCS monitoring project manager. All data would be stored for a minimum of 2 years after the end of the crediting period or last verification, whichever occurs later. In case there is any inconsistency on monitored data, the period will be removed from emission reduction crediting period, unless sufficiently reliable alternative methods are available and validated by external agencies appointed to verify monitoring report submitted to VCS Board.

QA & QC Procedures followed:

The calibration of the energy meters installed at the project site will be conducted once every five years, in accordance with the approval provided in the last Monitoring Report. Records of calibration certificates have been maintained for verification. The details of the calibrations have been provided below:

Equipment	Serial Number	Make	Calibration Date	Accuracy Class
Electronic Weighbridge	09201718	Endeavour	30-September-2016	III
			29-September-2017	
			28-September-2018	
			22-September-2019	
			09-September-2020	
Energy Meter	09512220	L&T	06-June-2016	0.5 for Active 1.0 for Reactive
			13-June-2018	

Calibration Dates: Calibration details are provided along with documentary evidences to the DOE.

The calibration validity of the electronic weighbridge and the energy meters are 08-September-2021 and 12-June-2023 respectively.

Emergency Preparedness: In the event of emergency situations like non-functioning of equipment's/instruments, the same has to be reported to Plant Head. The faulty equipment/instrument would be replaced with immediate effect. In the event of unavailability of the instrument, the emission reductions for the concerned would not be considered and generation records for the aforesaid months would be adjusted with reference to the guidelines for assessing compliance with the calibration frequency requirements.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions are quantified in line with paragraph 15 of the methodology AMS- III.Z Fuel Switch, process improvement and energy efficiency in brick manufacture (Version 06) as follows:

$$BE_y = EF_{BL} * P_{PJ,y}$$

Where:

BE_y	tCO_2e	The annual baseline emissions from fossil fuels displaced by the project activity in the year y
EF_{BL}	tCO_2/m^3	The annual production specific baseline emission factor
$P_{PJ,y}$	m^3	The annual net production of the facility in year y

For the project activity:

Annual Net Production of the facility from 01-September-2021 to 31-December-2021 = 113,961.24 m^3
Annual Net Production of the facility from 01-January-2022 to 24-November-2022 = 262,454.40 m^3

Specific Baseline Emission Factor[37]= 0.3993 tCO_2/m^3

As per Equation No.1 Baseline Emissions for the aforesaid monitoring period has been calculated as:

Baseline Emissions			
Year		2021	2022
$P_{PJ,y}$: net production of the facility	m^3	113,961.24	262,454.40
EF_{BL} : Baseline emission factor	tCO_2e/m^3	0.3993	0.3993
BE_y	tCO_2e	45,504	104,798

Baseline Emission (BE_y) for the current monitoring period is 150,302 tCO_2e (Project proponent is going to claim 125,251 tCO_2e considering the production capacity of 300,000 m^3).

Vintage Breakdown	Baseline Emissions (BE_y)
01-September-2021 to 31-December-2021	37,920
01-January-2022 to 24-November-2022	87,331
Total	1,25,251

37 http://www.faculty.ait.ac.th/visu/Prof%20Visu's%20CV/Books%20and%20research%20reports/BRICK%20AND%20CERAMIC.pdf

5.2 Project Emissions

Project emission sources relevant for this project are:

- Project emissions from electricity consumption within the project boundary.
- Project emissions from coal consumption in the boiler for steam generation.
- Project emissions from diesel consumption in the DG set within project boundary.

Thus, Project Emission (PE_y) = $PE_{elec,y}$ + $PE_{Coal,y}$ + $PE_{Diesel,y}$

Project emission from electricity consumption within the project boundary:

Referring to, "Tool to calculate baseline, project and/or leakage emission from electricity consumption", version no. 01[38] the project emission from electricity consumption has been calculated as follows:

$$PE_{elec,y} = \sum_j EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$$

$PE_{elec,y}$	tCO_2/yr	Project emission due to electricity consumption in year y
$EC_{PJ,j,y}$	MWh/yr	Quantity of electricity consumed by the project emission source j in year y
$EF_{EL,j,y}$	tCO_2/MWh	Emission factor for electricity generation for source j in year y
$TDL_{j,y}$	%	Average technical transmission and distribution losses for providing electricity to source j in year y

For the project activity:
Quantity of electricity consumed by the project activity from 01-September-2021 to 31-December-2021 = 642.21 MWh
Quantity of electricity consumed by the project activity from 01-January-2022 to 24-November-2022 = 1,755.90 MWh
Emission factor for electricity generation for source j in year y[39] = 1.3
Average technical transmission and distribution losses for providing electricity to project = 20%

As per the equation mentioned above -

Period	Electricity Consumption ($EC_{PJ,j,y}$)	Emission Factor ($EF_{EL,j,y}$)	Project Emission ($PE_{elec,y}$)
	MWh	tCO_2/MWh	tCO_2

[38] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am_-tool-05-v1.pdf (Version 01, EB 39, Annex-7, date 16-May-2008)

[39] Tool to calculate baseline, project and/or leakage emission from electricity consumption, version no. 01 (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am_-tool-05-v1.pdf (Version 01, EB 39, Annex-7, date 16-May-2008)

01-September-2021 to 31-December-2021	642.21	1.3	1,002
01-January-2022 to 24-November-2022	1,775.90	1.3	2,771

- Project emissions from coal consumption in the boiler for steam generation:

As per the tool, CO_2 emissions from fossil fuels combustion are calculated based on quantity of fuels combusted and the CO_2 emission co-efficient of these fuels.

The applicable equation is:

$$PE_{FC,j,y} = \sum_{i} FC_{i,j,y} \times COEF_{i,y}$$

Where,

$PE_{FF,y}$	Are the CO_2 emissions from fossil fuel combustion in process j during the year y (tCO_2/yr)
$FC_{i,y}$	Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)
$COEF_{i,y}$	Is the CO_2 emission coefficient of fuel type i in year y (tCO_2/mass or volume unit)

As per the tool, the CO_2 emission coefficient can be calculated using one of the options, depending on the availability of data.

- Option A: Based on the chemical composition of the fossil fuel type i
- Option B: Based on the net calorific value and the CO_2 emission factor of the fuel type i.

Based on availability of data, Option B has been used to calculate the CO_2 emission co-efficient as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

Where:

$COEF_{i,y}$	Is the CO_2 emission coefficient of fuel type i in year y (tCO_2/mass or volume unit)
$NCV_{i,y}$	Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)
$EF_{i,y}$	Is the weighted average CO_2 emission factor of fuel type i in year y (tCO_2/GJ)

$PE_{Coal.y} = FC_{Coal.y} * COEF_{Coal.y}$

$COEF_{Coal,y} = NCV_{Coal,y} * EF_{Coal,y}$

For the project activity:

Period	Coal Consumption	Weighted average net calorific value	Weighted average CO2 emission factor of coal	Project Emissions from Coal Consumption

		of coal		
	Kt	TJ/kt	tCO_2/TJ	tCO_2
01-September-2021 to 31-December-2021	3.12	26	100	8,111
01-January-2022 to 24-November-2022	7.44	26	100	19,352

- Project emissions from diesel consumption in the DG set within project boundary

As per the project emissions tool calculation, CO_2 emission from fossil fuels combustion is calculated based on quantity of fuels combusted and the CO_2 emission co-efficient of these fuels.

The applicable equation is:

$$PE_{FC,j,y} = \sum_{i} FC_{i,j,y} \times COEF_{i,y}$$

Where:

$PE_{FF,y}$ Are the CO_2 emissions from fossil fuel combustion in process j during the year y (tCO_2/yr)

$FC_{i,y}$ Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)

$CO_{EFi,y}$ Is the CO_2 emission coefficient of fuel type i in year y (tCO_2/mass or volume unit)

As per the tool, the CO_2 emission coefficient can be calculated using one of the options, depending on the availability of data.

- Option A: Based on the chemical composition of the fossil fuel type i
- Option B: Based on the net calorific value and the CO_2 emission factor of the fuel type i.

Based on availability of data, Option B has been used to calculate the CO_2 emission co-efficient as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

Where:

$COEF_{i,y}$	Is the CO_2 emission coefficient of fuel type i in year y (tCO_2/mass or volume unit)
$NCV_{i,y}$	Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)
$EF_{i,y}$	Is the weighted average CO_2 emission factor of fuel type i in year y (tCO_2/GJ)

$PE_{Diesel.y} = DG_y * COEF_{Diesel.y} *$ Density of Diesel

$COEF_{Diesel,y} = NCV_{Diesel,y} * EF_{Diesel,y}$

$PE_{Diesel.y}$	tCO_2e/yr	Project emissions due to Diesel consumption in year y

DG_y	TJ/Gg	Quantity of Diesel consumed by the project emission source j in year y
$COEF_{Diesel,y}$	tCO_2e/TJ	Emission factor for Diesel generation for source j in year y
Density of Diesel	KG/liters	Density of Diesel

Using equation above

Period	Diesel Consumption	Weighted average net calorific value of Diesel	Weighted average CO_2 emission factor of Diesel	Project Emissions from Diesel Consumption
	Liters	TJ/Gg	tCO_2/TJ	tCO_2
01-September-2021 to 31-December-2021	15,000	43.3	74.1	41
01-January-2022 to 24-November-2022	27,950	43.3	74.1	77

Total Project Emissions (PE_y) for the current monitoring period has been tabulated below:

Period	Project Emissions from electricity consumption within the project boundary	Project Emissions from Coal Consumption	Project Emissions from Diesel Consumption	Total Project Emissions from the Project Activity
	tCO_2	tCO_2	tCO_2	tCO_2
01-September-2021 to 31-December-2021	1,002	8,111	41	9,154
01-January-2022 to 24-November-2022	2,771	19,352	77	22,200

5.3 Leakage Emissions

Leakage emission sources relevant for this project are:

- Leakage emissions due to raw material production
- Leakage emission due to raw material transportation
- Leakage emissions due to raw material production

Leakage emission due to raw material production has been calculated based on the formula:

$LE_{rm,\ prod,\ y} = RMC_{cement,\ y} * COEF_{cement} * RMC_{lim\ e,\ y} * COEF_{lime} * RMC_{gypsum,\ y} * COEF_{gypsum} + RMC_{aluminium.y} * COEF_{aluminium}$

Where:

$LE_{rm,prod,y}$	tCO_2	Leakage emission from raw material production in the year y
$RMC_{cement,y}$	Kt	Quantity of cement consumed for producing AAC blocks in the year y
$COEF_{cement}$	tCO_2/kt	CO_2 emission factor of cement production
$RMC_{lime,y}$	Kt	Quantity of lime consumed for producing AAC blocks in the year y
$COEF_{lime}$	tCO_2/kt	CO_2 emission factor of lime production
$RMC_{gypsum,y}$	Kt	Quantity of gypsum consumed for producing AAC blocks in the year y
$COEF_{gypsum}$	tCO_2/kt	CO_2 emission factor of gypsum production
$RMC_{aluminium,y}$	Kt	Quantity of aluminium powder consumed for producing AAC blocks in the year y
$COEF_{aluminium}$	tCO_2/kt	CO_2 emission factor of aluminium production

For the project activity:

Period	Freight Type	Raw Material consumed	Specific GHG Emissions
01-September-2021 to 31-December-2021	Raw Material	Tonnes	tCO_2/tonne of raw material
	Cement	12,237.29	0.638
	Lime	4,640.87	0.75
	Gypsum	391.96	0.01
	Al. Powder	50.34	1.7
01-January-2022 to 24-November-2022	Cement	28,230.57	0.638
	Lime	10,662.68	0.75
	Gypsum	956.18	0.01
	Al. Powder	113.05	1.7

Leakage emissions due to raw material transportation:

Leakage emission due to raw material transportation has been calculated based on the formula.

Where:

$$LE_{rm,trans,y} = \sum_{f} D_{f,y} * FR_{f,y} * EF_{CO2,f} * 10^{-6}$$

For the project activity

$LE_{rm,trans,y}$	tCO_2	Leakage emission from road transportation of freight in monitoring period m
$D_{f,y}$	Km	Return trip road distance between the origin and destination of freight transportation activity f in monitoring period m
$FR_{f,m}$	Tonne	Total mass of freight transported in freight transportation activity f in monitoring period m

$EF_{CO2,f}$	gCO_2/t-km	Default CO_2 emission factor for freight transportation activity f
f	Km	Freight transportation activities conducted in the project activity in monitoring period m

Period	Freight Type	Raw Material Transported	Total Round trip distance	Default CO2 Emission Factor for Freight Transportation activity
	Raw Material	Tonnes	Kms	gCO_2/t-km
01-September-2021 to 31-December-2021	Cement	12,303.03	139	129
	Fly ash	426,786.04	43	129
	Lime	4,749.84	980	129
	Gypsum	367.63	603	245
	Aluminum Powder	64.20	894	245
	Coal	2,505.62	709	129
01-January-2022 to 24-November-2022	Cement	28,853.06	139	129
	Fly ash	1,376,518.12	43	129
	Lime	11,211.69	980	129
	Gypsum	1,068.95	603	245
	Aluminum Powder	116.16	894	245
	Coal	7,599.22	709	129

Total Leakage Emissions (LE_y) for the monitoring has been tabulated below -

Period	Leakage Emissions from Raw Material Production	Leakage Emissions from Raw Material Transportation	Total Leakage Emissions from the Project Activity
	tCO_2	tCO_2	tCO_2
01-Sep-2021 to 31-Dec-2021	11,378	3,487	14,865
01-Jan-2022 to 24-Nov-2022	26,210	10,449	36,659

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5.4 GHG Emission Reductions and Carbon Dioxide Removals

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Reduction VCUs (tCO_2e)	Removal VCUs (tCO_2e)	Total VCUs (tCO_2e)
01-Sep-2021 to 31-Dec-2021	37,920	9,154	14,865	13,901	0	13,901

01-Jan-2022 to 24-Nov-2022	87,331	22,200	36,659	28,472	0	28,472
Total	**125,251**	**31,354**	**51,524**	**42,373**	**0**	**42,373**

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-Sep-2021 to 31-Dec-2021	13,353	13,901	4.11%	-
01-Jan-2022 to 24-Nov-2022	35,899	28,472	-20.69%	Related to the business activities (Lower production than expected)
Total	**49,252**	**42,373**	**-13.97%**	Related to the business activities (Lower production than expected)

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

No commercially sensitive information has been provided in the MR.

Section	Information	Justification