



VALIDATION REPORT

Blended Cement Project with Fly Ash – Lafarge India Private Limited

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DET NORSKE VERITAS



VALIDATION REPORT

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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Blended Cement Project with Fly Ash – Lafarge India Private Limited” on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV’s opinion that the project as described in the project design document version-03 of 19th September 2006 meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0005 version-03. DNV requests the registration of the “Blended Cement Project with Fly Ash – Lafarge India Private Limited” as a CDM project activity.

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Appendix A Validation Protocol

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CMA	Cement Manufacturers Association of India
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IS	Indian Standards
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OPC	Ordinary Portland Cement
PDD	Project Design Document
PPC	Portland Pozzolona Cement
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Lafarge India Private Limited has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the “Blended Cement Project with Fly Ash – Lafarge India Private Limited” in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

C Kumaraswamy	DNV IndiaTeam Leader,	GHG auditor
Santhosh Jayaram	DNV India	GHG auditor, sector expert
Subhendu Biswas	DNV India	Internal Reviewer

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0005 version-03. The validation team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach, focusing on the identification of significant risk for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of Proposed CDM Project

The project activity proposed by Lafarge India Private Limited produces Portland pozzolanic cement at their Jojobera Cement Plant. The Jojobera plant is only a grinding unit and obtains clinker from two other clinker manufacturing Lafarge units – Arasmeta and Sonadih, both located in the state of Chattisgarh, India. The project involves optimisation of clinker through the additional use of fly ash as an additive in the manufacture of Portland pozzolana cement. This is beyond current practices in the region selected, which is the eastern region of India. This increase in blending of fly ash will reduce the clinker requirement resulting in reduction of fossil fuel consumption for clinker manufacturing. The project also contributes in reducing environmental effects due to mining of limestone used for clinker manufacturing.



The total estimated emission reduction due to the project activity is approximately 34 211 t of CO₂ e per year.

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design and the baseline and monitoring methodology
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /3/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “Blended Cement Project with Fly Ash – Lafarge India Private Limited” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification may be used where additional information is needed to fully clarify an issue.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD /1/ dated 2006-09-19 submitted by Lafarge India Private Limited (and earlier versions) and additional background documents related to the project design and baseline were assessed as a part of the validation.

2.2 Follow-up Interviews

On the 20th February 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Lafarge India Private Limited were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Lafarge India Private Limited	➤ Determination of project additionality and ascertaining that CDM was considered during the project conceptualisation.
	➤ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations.
	➤ Resources, training needs and procedures for operation and maintenance.
	➤ Monitoring methodology.
	➤ Environmental consents

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV, presented to the project participants in DNV's draft validation report of 26th February 2006 (rev.01) were resolved during communications between Lafarge Cement and DNV.

To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, Lafarge India Private Limited decided to revise the PDD and resubmitted the PDD version-03 on 19th September 2006. After assessing the revised PDD, DNV issued this final validation report and opinion.



3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation dated 19 September 2006.

3.1 Participation Requirements

The project is being proposed as a unilateral project by Lafarge India Limited. India has ratified the protocol and established the DNA as per participation requirements under the Kyoto Protocol. The DNA of India approved the project on 9th October 2006 /2/. No public funding has been used for the project activity.

The project is expected to contribute to sustainable development through increased generation of employment, reduction in GHG related to calcination of limestone, reduction of pollution due to disposal of flyash and enhancing energy security in the surrounding communities.

3.2 Project Design

The objective of the proposed project activity is to develop Portland pozzolana cement (PPC) grades with high fly-ash content in order to replace clinker in the manufacturing of PPC. The project involves fly ash procurement from Tata Powers Company Limited (TPCL) located adjacent to the Lafarge Jojobera unit and its utilization for production of PPC. The Lafarge Jojobera plant proposes to add additional fly ash in an incremental manner year-wise to reduce clinker content, thus avoiding GHG emission from clinker production. While the Jojobera unit is solely a grinding unit, the clinker is sourced from the two clinker manufacturing units of Lafarge located at Sonadih and Arasmata.

In order to meet the above objective, Lafarge had to install a new ball mill and bring in add-on technologies in their existing mill that enabled the addition of desired quantity of fly ash while maintaining quality standards as prescribed under IS specification. The project activities will reduce clinker production and the associated GHG emissions by increasing the blend of fly ash in PPC produced at the project sites from the current 31 % and beyond but within the stipulation of 35% as per Indian Standard 1489. Emissions arising from the use of fossil fuel for clinker manufacture (calcination) of limestone and consumption of electrical energy will thus be reduced.

The project proponent has chosen a fixed crediting period of 10 years with the starting date of the crediting period as 15th May 2001.

3.3 Project Baseline

The project applies the approved baseline methodology ACM 0005 version-03, "Consolidated Baseline Methodology for increasing the Blend in Cement Production." The applied baseline methodology is justified as it has been demonstrated that the project activity ensures:

- that there is no shortage of additives i.e. fly ash for blending in cement, and there is no alternative allocation or use of additional amount of additives used,



- that it excludes export of blended cement, and includes only domestically sold output, and
- that data on other cement manufacturers in the region is available from the CMA of India which is published annually.

The project participants have chosen the market for the Jojobera cement plant as the states of Bihar, Jharkhand, Assam, Meghalaya, Orissa and West Bengal, which will serve as the “geographic region” for the baseline clinker % estimation. This is justified as per the region selection criteria of methodology ACM0005 and meets all the conditions required, as

- i) 95% of total production is sold within the region selected,
- ii) The region selected includes six plants with published data from 2001, and
- iii) Production in the region is more than the minimum four times of project plant’s output as required by the methodology.

The baseline has been selected by evaluating the prevailing clinker percentage in PPC manufacturing in the selected region, which use similar inputs as the project and face similar economic, market and technical circumstances. The published data of CMA of India has been used for verification of the same. On evaluation the option of “the production weighted average mass percentage of clinker in the top 20% (in terms of share of additives) of the total production of the blended cement type in the region” is found to be lowest at 70.4% and this is taken as the baseline clinker% for the project. While the option of “the average (weighted by production) mass percentage of clinker for the 5 highest blend cement brands for the relevant cement type in the region” has been estimated as 72.5%, the other option of ‘the mass percentage of clinker in the relevant cement type produced in the proposed project activity plant before the implementation of the CDM project activity’ is not applicable as the Jojobera cement plant was initially producing only slag cement. While the existing PPC grinding circuit 1 was modified for the project activity, a new grinding circuit 2 was introduced as a greenfield activity to meet the objective of producing PPC with incremental addition of fly ash. The project has chosen the option of establishing the baseline clinker% *ex-ante* with an annual increase of 2% in additive% during the 10 year crediting period. In the project activity additive % is defined as 100-clinker%.

It has been verified that the project proponent has the relevant records of operating history for the period 2001 to 2005 and it has been demonstrated that in the absence of the project activity, the existing practice of cement production with lower amount of fly ash % would have continued.

The baseline emission factors have been deduced from the equations stated in the approved methodology ACM0005 version-03. The data used for arriving at the baseline emission factor are validated and found to be correct.

3.4 Additionality

The additionality of the project has been established using the “tools for the demonstration and assessment of additionality” approved by the CDM-EB. The project activity primarily demonstrates the additionality through the technology and prevailing practice barriers.

Step 0: Preliminary screening based on the starting date of the project activity



As the project proponent wishes to have a crediting starting prior to the registration of project activity which started before registration, it must be established that the CDM was seriously considered during project inception. The following primary documentation to this effect has been verified:

- a) The purchase order for additional equipment such as air separator, bucket elevator, air slides and solid flow meter incorporated into the system in order to produce PPC from the existing mills.
- b) Internal management notes dated April 2001 mentioning the cost benefit analysis and also possibility of CDM credits for environment friendly projects in cement plants.
- c) Plant records and evidence on R&D activities and trend showing increase in percentage of fly ash addition.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations:

The alternative scenarios identified for the project activity are:

Alternative 1: Continuation of the existing practice of cement (PPC) production with low share of additives.

Alternative 2: Production of ordinary portland cement / portland blast furnace slag cement activity.

All scenarios meet the requirements of the Bureau of Indian standards specification.

Step 2: Investment analysis

Not applied.

Step 3: barrier analysis

It has been addressed that OPC cements are more popular among customers and PPC cements of similar quality/grade are not available and hence not widely accepted. Higher investments would be required to develop blended/PPC cements with comparable or superior standards. Moreover, good quality of fly ash is not always ensured by power plants posing risk and challenges for cement manufacturers. It has been verified by DNV that INR 35 million was invested for installation of additional equipment in the existing ball mill and about INR 452 million was invested in designing, procuring and installation of the second ball mill, specifically for PPC production with incremental addition of fly ash, in addition to INR 2.8 million for procuring quality control and R&D equipments in order to produce best quality PPC and high share of fly ash. These investments are solely for the purpose of producing PPC.

It has been demonstrated by Lafarge and evidenced through letters from traders that sale of PPC is difficult and tenders from governmental bodies are inviting bids for OPC only, which prove and support the claim that market perception to PPC is poor. The argument by Lafarge that CDM allows dedicated research and marketing effort to overcome these barriers is considered as reasonable. The resistance to the newer blend of cement in a market used to the normal blend of cement is thus a major barrier, also considering that the project activity is being implemented in all the three plants of the project proponent.

*Step 4: common practice analysis*

Data available from CMA of India demonstrates that the manufacturing of PPC with fly ash percentage of 15 to 25% in the region was a common practice at the time of project implementation. The project plans to increase the fly ash proportion from 31% to 35% over the crediting period, which is beyond the common practise in the region.

Step 5: Impact of CDM registration

CDM revenues may enhance the viability of the project and is expected to impact the project proponent's research and marketing efforts towards overcoming the market barriers. It was demonstrated by Lafarge that the revenues will be invested in R&D and marketing activities to sustain the project activity.

3.5 Monitoring Plan

The project applies the approved monitoring methodology ACM0005 version 03, titled "Consolidated Monitoring Methodology for Increasing the Blend in Cement Production".

The monitoring methodology adopted is applicable and justified as the proposed project activity aims to increase the share of fly ash as additive in the PPC production beyond current practices in the selected region.

The monitoring plan adequately addresses all necessary information for monitoring and reporting of emission reductions due to the project activity.

As per the monitoring plan all critical data are either measured or calculated and parameters such as cement production, coal consumption, fly ash consumption etc., are recorded and archived up to 2 years after crediting period.

The project involves clinker manufacturing at Arasmeta and Sonadih in Chhattisgarh, India and grinding activity for production of PPC at Jojobera, Jharkhand, India. The regional grids that supply power for both locations are different and thus emission factors for the western region (supplying grid power to Arasmeta and Sonadih plants) and eastern grid (supplying grid power to Jojobera plant) have been evaluated separately. Separate baseline emission factors for regional grids is established *ex-ante* based on the approved methodology ACM002 by using the combined margin approach. The weighted average of the "operating margin" and the "build margin" emission coefficient for eastern regional grid of India has been estimated to be 0.988 kg CO₂e / kWh and western regional grid of India has been estimated to be 0.984 kg CO₂e / kWh. The "operating margin" emission factors have been estimated based on the "simple OM" approach as low cost / must run plants constitute less than 50% of the generation of the eastern and western regional grids. The completeness of the set of power plants as well as the correctness of the reported fuel consumption and electricity generation data has been verified. All data has been sourced from data published by the Central Electricity Authority.

The monitoring plan also provides provision for monitoring leakage caused by transportation of additional amount of additives. The parameters associated with leakage determination have been verified and found to be correct. Calibration and maintenance of process instrumentation are also as per approved monitoring methodology and are governed by the established procedures as a part of quality management system of the organisation.



Documentation have been reviewed and revised to cover issues such as internal audit, performance reviews and corrective actions pertaining to the blended cement project.

The monitoring of sustainable development indicators has not been included in the monitoring plan. This is considered acceptable as the DNA of India does not warrant monitoring of such indicators.

3.6 Calculation of GHG Emissions

The calculation of the GHG emissions has been done as per the ACM0005 version 2. All the aspects related to the direct and indirect GHG emissions have been addressed and the calculations are presented in a transparent manner.

The project, on implementation, is expected to result in reductions of an average 34 211 tonnes of CO₂ equivalent per year.

DNV has verified all the factors, sources and calculations based on production data and confirmed the reasonableness of the forecasted emission reductions.

3.7 Environmental Impacts

Indian regulation does not warrant an EIA to be conducted for this size of the project. The project proponent has assessed the possible impacts of project activity on the neighbouring environment through environment management system and established that no adverse environmental impacts are foreseen. This assessment has been verified and is deemed appropriate.

3.8 Comments by Local Stakeholders

While a formal stakeholders' process is not mandatory for this type of project under Indian Environmental Regulations, Lafarge has identified the local community, statutory and regulatory bodies, thermal power plants supplying fly ash, and employees of the organisation as key stakeholders. Through meetings and direct consultation stakeholders were consulted on the socio-economic impacts of the project activity.

Interactions with the stakeholders were verified and it has been confirmed that no adverse comments were received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of *date* was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 12th November 2005 to 11 December 2005.

One comment was received on 11th December 2005. The comment received (in unedited form) is given in the below text box.

Comment by: Yimeng Zhang, ESI

Inserted on: 2005-12-11

Subject: Economic Benefit

**Comment:**

- Project developer mentioned the project will bring economic benefit by reducing energy intensive clinker production, hence conserving energy. Therefore, in describing the economic barrier, the benefit from the energy saving should be considered with financial analysis to be shown.
- In step 0 of B3, project develop declared that CDM incentive was seriously considered by the management of JCP. Documentation of the evidence should be shown.
- In G1, it only says identified stakeholders was invited from comments, but it doesn't explain how the comments was invited

How DNV has considered the comment received in its validation:

Lafarge has not opted for the financial analysis (step 2 of the additionality tool), but rather addressed the additional investments that have been incurred in going ahead with the project activity. It has been clearly addressed in the PDD and verified by DNV that INR 35 million was invested for installation of additional equipment in the existing ball mill and about INR 452 million was invested in designing, procuring and installation of the second ball mill, specifically for PPC production with incremental addition of fly ash, in addition to INR 2.8 million for procuring quality control and R&D equipments in order to produce best quality PPC and high share of fly ash. These investments are solely for the purpose of producing PPC. It is evident that without CDM benefits being considered this economic barrier could not have been overcome. The CDM project per se involves reduction in energy consumptions otherwise.

The following primary documentation has been verified to demonstrate that CDM was seriously considered. This has also been the outcome of the clarification request no 4.

- d) The purchase order for additional equipment such as ball mill, air separator, bucket elevator, air slides and solid flow meter incorporated into the system in order to produce PPC from the existing mills.
- e) Internal management notes dated April 2001 mentioning the cost benefit analysis and also possibility of CDM credits for environment friendly projects in cement plants.
- f) Plant records and evidence on R&D activities and trend showing increase in percentage of fly ash addition.

A meeting of the identified stakeholders had been conceived on 31st August 2005. Minutes of the meeting has been verified by DNV. All benefits including environmental and social aspects were informed to participants of the meeting and no adverse comment has been recorded.



5 VALIDATION OPINION

Det Norske Veritas Certification (DNV Certification) has validated the “Blended Cement Project with Fly Ash – Lafarge India Private Limited”. The validation was performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol criteria for the CDM, the CDM rules and modalities as agreed in the Marrakech Accords and relevant decisions by the CDM Executive Board.

The review of the project design documentation (PDD) and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

Lafarge India Private Limited is the only project participant in this project. The DNA of India has confirmed that the project assists in achieving sustainable development and has accorded the approval for the project.

The validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards India.

The project activity will reduce clinker production and associated GHG emissions by displacing clinker with fly ash in the production of Portland pozzolana cement. Emissions arising from the calcination of limestone, fossil-fuel based kiln combustion and consumption of electrical energy will be reduced. By increasing the percentage of fly ash in the cement production, the project is expected to result in reductions of 34 211 tons of CO₂ equivalent per year that are real, measurable and gives long-term benefits to the mitigation of climate change. An analysis of relevant barriers demonstrates that the proposed project is not a likely baseline scenario and emission reductions are hence additional to any that would occur in its absence.

The project correctly applies the approved baseline methodology ACM0005, version 3 “Blended Cement Project with Fly Ash – Lafarge India Private Limited”. The baseline has been selected by determining the common prevailing clinker percentage of PPC in other manufacturing plants in the selected region that use similar raw material as the project and which face similar economic, market and technical circumstances. It is justified that the proposed project activity itself is not a likely baseline scenario.

In summary, it is DNV’s opinion that the project as described in the PDD of September 2006 meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM000, version 3. Hence, DNV requests the registration of the “Blended Cement Project with Fly Ash – Lafarge India Private Limited” as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ Lafarge India Private Limited - *Clean Development Mechanism Project Design Document – “Blended Cement Project with Fly Ash – Lafarge India Private Limited”* Version 3 of September 2006 and its earlier versions
- /2/ Indian DNA, Host country approval letter – 9 October 2006

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /3/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /4/ ACM0005 Approved methodology Version 03 – Consolidated baseline Methodology for Increasing the Blend in Cement production
- /5/ IPCC: *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. 2000

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /3/ Lafarge India Private Limited:

Mr Sivaranjan Banerjee

Mr Kalol Basu

PwC:

Ms Aditi Paul

- o0o -

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	Annex 1 Party is yet to be identified	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR 1	LOA from the DNA of India has been obtained.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Decision 17/CP.7	OK	
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	India: The National Clean Development Mechanism (CDM) Authority Ministry of Environment and Forests

Requirement	Reference	Conclusion	Cross Reference / Comment
IV The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	India : date of ratification is on 26 th August 2002
V The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	N A	No Annex 1 party is yet identified
VI The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	N A	No Annex 1 party is yet identified
9. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
10. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
11. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
12. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
13. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD has been published on DNV's Climate Change website. Parties, stakeholders and NGOs were through the UNFCCC CDM website invited to provide comments on the validation requirement during a period of 30 days from 12 November

Requirement	Reference	Conclusion	Cross Reference / Comment
			2005 to 11 December 2005. One comment was received.
14. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
15. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
16. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The project activity of Lafarge India is located in their grinding unit at Jojobera in Jharkhand. The grinding unit is fed with clinker produced in their two cement works located at Arasmeta and Sonadih, in Raipur, Chattisgarh. The location of these sites are clearly defined in the PDD in section A.4.1		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project boundary is clearly defined and meets the requirements of ACM 0005. This includes <ul style="list-style-type: none"> ▪ PPC blend cement production at JCP ▪ Clinker production units – Arasmeta Cement Plant (ACP) and Sonadih Cement Plant (SCP) in Chhattisgarh ▪ Power generation in the grid connected to JCP (TISCO grid) and ACP and SCP (Chhattisgarh State Electricity Board Grid (CSEB)) ▪ Onsite captive power generation at SCP and ACP ▪ The pneumatic conveyor pipeline system used for transporting fly ash 		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			from the power plant to the JCP .		
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR, I	The objective of the proposed project activity is to develop (Pozzolana Portland Cement) PPC grades with high fly-ash content to replace clinker in the manufacturing of PPC. The project does not involve any major changes with regard to the manufacturing technology and reflects current good practices.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	<p>The technology for blending fly ash was indigenously developed by Lafarge India. It will enable utilisation of fly ash beyond the current average blend level in India. To this extent Lafarge has installed:</p> <ul style="list-style-type: none"> - A new ball mill and modified their existing mill - High efficiency air separators to improve fineness and particle distribution. - Additional de-dusting systems (bag filters) for environmental control. 		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	It is unlikely that the project technology will be substituted by other more efficient technologies within the project crediting period.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	Internal capacity building has been necessitated for operation of the ball mills, PPC production, testing, quality control and marketing.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Though not specifically addressed, this is considered acceptable as PPC manufacturing activity is not new to Lafarge and the company has addressed these requirements through their management systems.		OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR, I	The proposed project is a voluntary initiative by Lafarge. There are no regulatory requirements related to blended cements in India. Except IS 1489 (part 1) which stipulates that the fly ash content in the blended cement can vary between 15% and 35%. The project complies with all the rules and regulations of the host country.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR, I	Approval from the DNA of India shall be forwarded to DNV.	CAR-4	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	As in A.3.2	CAR-4	OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes, the project will create other benefits such as creating new employment opportunities, contributing to reduced energy requirements, limestone conservation and reducing problems		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			associated with handling, storage and disposal of fly ash.		
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR, I	Yes, the project applies approved consolidated baseline methodology ACM0005 "Consolidated methodology for increasing the blend in cement production".		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	<p>Yes, the chosen baseline methodology is applicable to the proposed project activity as the project aims to increase the share of additive fly ash in the production of PPC.</p> <p>As required in the chosen methodology, it has been demonstrated that the project activity:</p> <ul style="list-style-type: none"> Ensures sufficient supply of fly ash and the activity will not lead to other PPC producers to reduce their fly ash blend rate Output is sold domestically and has excluded export of blended cement <p>Data is available on cement types in the market for the project activity, and a</p>		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			database from the Cement Manufacturers Association of India has been utilised for this.		
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	<p>The benchmark for baseline emissions has been estimated based on the lowest values of the three options stipulated in ACM0005. This has been determined as the lower value of the stipulated options in ACM0005:</p> <p>(i) The average (weighted by production) mass percentage of clinker for the 5 highest blend cement brands for the relevant cement type in the region; or</p> <p>(ii) The production weighted average mass percentage of clinker in the top 20% (in terms of share of additives) of the total production of the blended cement type in the region.</p> <p>It has been argued that since the start of production of PPC in Jojobera, CDM has been considered, option (iii) <i>The mass percentage of clinker in the relevant cement type produced in the proposed project activity plant before the implementation of the CDM project activity is not applicable</i></p>	CL-1	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>It needs to be further demonstrated how option iii is not applicable</p> <ul style="list-style-type: none"> - when Lafarge has retrofitted the existing ball mill in circuit I and also added a new ball mill in circuit II in Jojobera and claims in the PDD that <i>the project initiative has led to incremental percentage of fly ash addition in PPC blend cement being produced at Jojobera cement plant of Lafarge India</i> - evidence of commissioning the Jojobera unit and commencement of PPC production. 		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	<p>Instead of the national market the project proponents have chosen the regional markets, based on the criteria stipulated in the ACM0005. The 'Satna Cluster' comprising of markets in Assam, Meghalaya, Bihar, Jharkhand, Orissa and West Bengal has been selected.</p> <p>The baseline does not take account of any other GHG gases other than CO₂, Changes in CH₄ and N₂O emissions are considered as negligible and are not taken into account which makes it conservative in nature.</p> <p>In determining the benchmark under options (i) and (ii), it is not whether</p> <ul style="list-style-type: none"> - For the cement type under consideration and for high blend brands in the region, random and statistically significant samples have been selected and analyzed for the percentage of clinker by an independent laboratory. 	CL-2	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<ul style="list-style-type: none"> - Have registered CDM projects been excluded in the sample? OR - Reliable and up to date annual data available from reputable and verifiable external sources been used. 		
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	<p>The baseline has been determined taking into view all the policies / legislations related to cement manufacturing and by mapping all cement manufactures producing PPC type of blended cement only.</p> <p>Details of the baseline, referred to as provided in annex-3 of the PDD are missing.</p>	CL-3	OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	As per the methodology the baseline is selected by determining the common prevailing clinker percentage of PPC in other manufacturing plants in the selected region who use similar raw material as the project and face similar economic, market and technical circumstances.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes. The baseline has been determined based on data published by the Cement Manufacturers Association of India (CMA).		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	In the absence of the project activity, it is likely that the existing practice of cement production would have continued.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR, I	<p>Yes, the project additionality has been demonstrated through the use of the latest tool for additionality:</p> <p>Step 0: The start date of the project activity is May 2001</p> <p>Step 1: 2 alternatives to the proposed project activity have been identified and all</p>	CL-4	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>of them are consistent with the current laws and regulations.</p> <p>Step 2: Investment Analysis: It has been presented that Lafarge invested INR 35 million for the installation of additional equipment in the existing ball mill and about INR 452 million in designing, procuring and installation of the second ball mill, Also INR 2.8million was invested for procuring quality control and R&D equipment.</p> <p>Step 3: Barrier analysis: Technological barriers: It has been argued that maintaining the quality of the cement, whilst increasing the blending of fly ash additives represents a major technical barrier to implementation of the project activity. Technical barriers also exist due to market resistance relating to the use of high fly ash PPC.</p> <p>It has been presented that the quality of fly ash as being critical for increasing the percentages in the blend, and this was not under the control of JCP but more dependent on the quality of coal used and operational controls in the power plant supplying the fly ash. Lafarge has argued that JCP had to co-ordinate and work closely with organisations supplying the fly ash with requisite quality parameters.</p> <p>Moreover, substantial R&D efforts had to be initiated to enable the unit add more fly ash</p>		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>and produce PPC of high quality, achieve and maintain consistent operational parameters, desired particle size distribution and use of grinding aids.</p> <p>Step 4: Common practice analysis: it has been argued that the baseline levels represent the common practice in the industry.</p> <p>Step 5: The carbon credits received from the CDM project activity will help remove market barriers restricting increased flyash content in blended cement and invest in further R&D efforts.</p> <p>In our opinion, it remains to be more clearly demonstrated that project activity is additional, in the absence of:</p> <ul style="list-style-type: none"> - Data and evidence to show that the perception that high additive blended cement is of inferior quality - The quality of clinker acts as a barrier to increasing the fly ash blend as does the fineness of high fly ash PPC and the distribution of fly ash components in coarse fractions of cement. - Investment analysis in step 2 and as called-for in the tool for demonstrating additionality - Details of the investments and plans envisaged by the organisation are required to ascertain that marketing initiatives are still needed to 		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			overcome the related barriers of PPC manufacturing - Evidence of project implementation in May 2001 – shall be provided. - Evidence of considering CDM incentives at the start of the project activity shall be provided.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	No risks to the baseline have been identified.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Copies of TIFAC and TERI reports shall be provided to DNV and addressed in the PDD regarding fly ash availability	CL-5	OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR, I	The project starting date is 15-05-2001 and the expected operational life time of the project is 25 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A fixed crediting period of 10 years has been chosen with the starting date as 15-05-2001.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR, I	The monitoring methodology is per the approved methodology ACM0005 for “increasing the blend in cement production”.		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	<p>Yes, the chosen baseline methodology is applicable to the proposed project activity as the project aims to increase the share of additive fly ash in the production of PPC beyond current practices in India.</p> <p>It has been demonstrated that the project activity:</p> <ul style="list-style-type: none"> • Ensures sufficient supply of fly ash and the activity will not lead to other PPC producers to reduce their fly ash blend rate • Output is sold domestically and has excluded export of blended cement • Utilizes data available on cement types in the market (from the 		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			database of the Cement Manufacturers Association of India)		
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes. All relevant data as stipulated in the approved monitoring methodology have been sufficiently addressed in the PDD.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes		OK
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	All relevant data necessary for the estimation or measuring the GHG emissions within the project boundary have been included in the monitoring plan.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Project emissions per tonne of blended cement, (t CO ₂ / t of BC) have been chosen as GHG indicator.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes. It will be possible to monitor the specified project GHG indicators.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	The parameters to be monitored to evaluate the emissions due to the project activities are measurable and has been confirmed on site visit that they can be monitored for real and recorded as per the format.		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Electricity consumption for conveyance of additives within the premises has been considered, however, emissions due to transportation of these additives have not been clearly addressed.	CL-6	OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	in D.3.1	CL-6	OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	It is not clear whether JCP has the flexibility to run on OPC or PPC. The plan does not address specifically the recording of running hours of the conveying system for additives under PPC production.	CL-7	OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	Yes		OK
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	Yes, the baseline indicators have been chosen in line with the ACM0005. Captive power and grid power have also been considered in the baseline.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	The baseline is evaluated ex-post for each crediting year and the emission due to calcinations, clinker generation both due to		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			consumption of grid electricity and captive generation and grinding /preparation of additive is taken care of.		
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	The baseline indicators are all based on available data and actual records of plant operations.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?			Yes,		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR, I	The monitoring of sustainable development indicators has not been included in the monitoring plan. However, this is considered acceptable as the DNA of India does not warrant monitoring of such indicators.		OK
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR, I	The Vice President (Jojobera Cement Plant) is responsible for project management.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR, I	The Vice President is assisted by a team consisting of managers from quality control, maintenance and service departments who would responsible for implementing the,		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			monitoring plan.		
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR, I	Procedures exist as part of the quality and environment management systems of the company. The company is certified to ISO 9001 and ISO 14001 systems.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Same as D 6.3		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Same as D 6.3		OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Same as D 6.3		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Same as D 6.3		OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Most the data is archived in electronic format which are preserved as per standard procedures established by the organisation. The procedure has been checked and found to be adequate.		OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Same as D 6.3		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	Same as D 6.3		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Same as D 6.3		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	Same as D 6.3		OK
D.6.13. Are procedures identified for corrective actions	/1/	DR	Same as D 6.3		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
in order to provide for more accurate future monitoring and reporting?					
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1.Predicted Project GHG Emissions <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR, I	All relevant direct and indirect GHG emissions have been captured in the project design and through the application of the methodology.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR, I	Detailed emission calculations shall be provided to DNV for verification	CL-8	OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	As in E.1.2	CL-8	OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	No major uncertainties are foreseen.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes. Mainly CO2.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2.Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	Leakage emissions for transport of additives have been adequately addressed.	CL-6	OK
E.2.2. Have these leakage effects been properly accounted for in calculations?	/1/	DR	As in E.1.2.	CL-8	OK
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	/1/	DR	As in E.2.1	CL-8	OK
E.2.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	As in E.2.1	CL-8	OK
E.2.5. Have conservative assumptions been used when calculating leakage?	/1/	DR	As in E.2.1	CL-8	OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	/1/	DR	As in E.2.1	CL-8	OK
E.3.Baseline Emissions <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	Yes		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	The baseline takes into account all the possible sources of emissions and is in line with the approved baseline methodology ACM0005 which is applicable for this project		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	As in E.1.2	CL-8	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	As in E.3.3	CL-8	OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	No uncertainties are foreseen in the baseline evaluation, as the data are drawn from reputable publicly available domain and verifiable.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	As in E.3.3	CL-8	OK
E.4.Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	As in E.1.2	CL-8	OK
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR, I	Environmental Impact Study has been was conducted at the site to assess the environmental impact(s) of the project activity and the associated activities involved in production of PPC blend. While it is claimed that no adverse impacts are likely to occur from the project activities, a	CL-9	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			copy of the EIA shall be forwarded to DNV for verification		
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	As in F.1.1	CL-9	OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No adverse impact on the environment has been envisaged due to the CDM project activity.		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	No significant transboundary impacts are expected to occur due to the project activity		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	As in F.1.1	CL-9	OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Current and valid Water and Air consents as provided by the respective state pollution control boards for all the three sites shall be provided to DNV	CL-9	OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR, I	Key stakeholders consulted for the project activity have been 1. Neighbouring community 2. Local community leaders 3. Local Govt. officials 4. Employees (including contractual labours) 5. Contractors; and 6. Fly ash providers		OK
G.1.2. Have appropriate media been used to invite	/1/	DR	It is not clear from the PDD the following:	CL-10	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
comments by local stakeholders?			<ul style="list-style-type: none"> - At what intervals are stakeholder consultation process carried out – PDD indicates at periodic intervals? - When were the last two consultations carried out? - Did they cover all three sites? - What is the exact process of consultation adopted? - What were the comments received? - Evidence for all the above 		
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Indian Regulations does not warrant a stakeholder consultation process for the project activity.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	As in G.1.2	CL-10	OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	As in G.1.2	CL-10	OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: Approval from the DNA of India shall be forwarded to DNV	A.3.2, 3.3	Host Government approval letter has been provided	Accepted. Host Government letter dated 9 th October 2006 has been verified. CAR 1 is closed.
CL 1: It has been argued that since the start of production of PPC in Jojobera, CDM has been considered, and therefore option (iii) <i>The mass percentage of clinker in the relevant cement type produced in the proposed project activity plant before the implementation of the CDM project activity is not applicable</i> This shall be substantiated with evidences of commissioning the Jojobera unit and commencement of PPC production.	B.2.1	Jojobera plant started producing PPC from the year 2001 with CDM benefits in consideration. The actual production started from May 2001 with 31% of additives. - Reference 1. Commissioning of Lafarge Jojobera Unit 2. Production schedule verses actual production of all types of cement blends at the unit during the year 2001. 3. Management document(s) to display that project was undertaken with serious CDM consideration. From the above reference documents (submitted in hardcopies) it is evidence that project is eligible for CDM from the start of PPC production in the unit with full swing (from 2001). Thus, while considering the benchmark for baseline emission as mentioned in	Accepted. Evidences provided have been verified. As Jojobera unit is a greenfield project, option 3 is not applicable and this is in line with version 3 of the approved methodology. CL 1 is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		the approved methodology ACM0005/ version 3, the option (iii) - <i>The mass percentage of clinker in the relevant cement type produced in the proposed project activity plant before the implementation of the CDM project activity.</i> – requires three years of actual operational data on the relevant cement type. As the project is green field project, this data set is not available prior to the project implementation. Hence, this option is not applicable to this project.	
<p>CL 2: In determining the benchmark under options (i) and (ii), it is not whether</p> <ul style="list-style-type: none"> - For the cement type under consideration and for high blend brands in the region, random and statistically significant samples have been selected and analyzed for the percentage of clinker by an independent laboratory. - Have registered CDM projects been excluded in the sample? OR - Reliable and up to date annual data available from reputable and verifiable external sources been used 	B.2.2	<p>All data related to project baseline benchmark determination is based on data received from Cement Manufactures Association (CMA) www.cmaindia.org (PDD reference – page 12 under discussion on applicability criteria of the methodology).</p> <p>CMA is a third party, and publishes reliable data collected from all cement units in India on annual basis. – Refer to calculation excel sheet for detail data considered for project calculation.</p> <p>As on date there is no registered project under the relevant category of the project, thus all plants in the region</p>	<p>Benchmark data has been verified and accepted.</p> <p>CL 2 is closed</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		has been included for benchmark additive percentage at the baseline	
CL 3: Details of the baseline, referred to as provided in annex-3 of the PDD is missing	B.2.3	Refer to the calculation excel sheet submitted.	Accepted. Detailed spreadsheet calculations provided have been verified. CL 3 closed.
CL 4: In our opinion, it remains to be more clearly demonstrated that project activity is additional, in the absence of: <ul style="list-style-type: none"> - Data and evidence to show that the perception that high additive blended cement is of inferior quality - The quality of clinker acts as a barrier to increasing the fly ash blend as does the fineness of high fly ash PPC and the distribution of fly ash components in coarse fractions of cement. - Investment analysis in step 2 and as called-for in the tool for demonstrating additionality - Details of the investments and plans envisaged by the organisation are required to ascertain that marketing initiatives are still needed to overcome the related barriers of PPC manufacturing - Evidence of project implementation in May 2001 – shall be provided. 	B.2.7	Following documentary evidences submitted to support additionality of the project – <ol style="list-style-type: none"> 1. Detail calculation with assumption on Internal rate of Return/ Net present Value of the project (Refer - soft copy – excel sheet – NPV JCP expansion) 2. A write-up from the unit R&D department on the steps taken to increase the fly ash addition in the cement blend with supporting documents on test results/ internal and external communication/ exclusive contracts, etc. 3. Detail promotional plans and budgetary allocation for promoting blended cement from year 2000 till date. 4. Tools of marketing and evidence of different stakeholder meet conducted to 	Accepted. Evidences of tender rejections provided do indicate the preference of OPC as opposed to blended cement. The note provided by the R&D department indicates that the quality of clinker from the manufacturing units acts as a barrier to the increased fly ash introduction Investment analysis (step 2) has not been chosen. Promotional plans and budgetary allocation details provided for demonstrating that marketing initiatives were needed to overcome related barriers have been verified. Following references have been verified to demonstrate that CDM was

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<ul style="list-style-type: none"> - Evidence of considering CDM incentives at the start of the project activity shall be provided 		<p>promote blended cement</p> <p>5. Few evidences of tender rejection and preference of OPC over PPC and other blended cement.</p>	<p>considered at the start of the project activity and project implementation in May 2001.</p> <ul style="list-style-type: none"> - Commissioning of Lafarge Jojobera Unit - Production schedule verses actual production of all types of cement blends at the unit during the year 2001. - Management document(s) to display that project was undertaken with serious CDM consideration <p>CL 4 is closed</p>
<p>CL 5: Copies of TIFAC and TERI reports shall be provided to DNV and addressed in the PDD regarding fly ash availability.</p>	B.2.9	Refer to the soft copy provided of the reports.	<p>Accepted. Copies of TIFAC and TERI reports indicate abundant availability of flyash.</p> <p>CL 5 is closed</p>
<p>CL 6: Electricity consumption for conveyance of additives within the premises has been considered, however, emissions due to transportation of these additives has not been clearly addressed.</p>	D.3.1, 3.2, E.2.1	<p>The project is unique. Due to locational advantage beside a power plant, no additional transportation is required. All additives transported to the site through pneumatic belt and its hour of operation is monitored and recorded.</p> <p>As mentioned in the approved methodology ACM0005 version 03 (refer – page 2) ... “Emissions reductions from transport of raw materials for clinker production are not taken into account as a conservative</p>	<p>Complimentary information provided is accepted.</p> <p>CL 6 is closed.</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		simplification"... same has been followed inline with approved methodology.	
<p>CL 7: It is not clear whether JCP has the flexibility to run on OPC or PPC. The plan does not address specifically the recording of running hours of the conveying system for additives under PPC production</p>	D.3.3	<p>In absence of the project, i.e. to convert from producing OPC to PPC and use increasing quantity of additives (fly ash), Lafarge would have operated the cement mill to produced OPC as its earlier practice.</p> <p>Jojobera PPC production and expansion plan included the management decision to stop OPC production in Arasmeta unit and move the cement mill to Jojobera unit for PPC production. Jojobera unit has been selected for the locational advantages (adjacent to Tata Power) and assured availability of fly ash (exclusivity contract assurance from Tata Power) including hassle free fly ash transportation system.</p> <p>This decision is in line with Lafarge groups' decision to reduce 20% of CO₂ emission from its cement kilns being operated across the world.</p> <p>Additional amount of INR 487 million were invested to establish the mill and</p>	<p>Complimentary information provided is accepted.</p> <p>CL 7 is closed</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>start commercial production of PPC. In absence of the project decision Lafarge would not have required to invest such high amount of capital and run the mill at Arasmeta that has been specifically designed for OPC production.</p> <p>To record the operating hours of the conveyor system has been included in the monitoring plan of the project.</p> <p>Refer to page 27 of revised PDD version 03.</p>	
CL 8: Detailed emission calculations shall be provided to DNV for verification	E.1.2, 2.2, 3.3, 4.1	Refer to the calculation excel sheet submitted.	Accepted. Calculations provided have been accepted. CL 8 is closed
CL 9: While it is claimed that no adverse impacts are likely to occur from the project activities, a copy of the EIA shall be forwarded to DNV for verification Current and valid Water and Air consents as provided by the respective state pollution control boards for all the three sites shall be provided to DNV	F.1.1, F.1.6	Hard copies have been submitted	EIA report and copies of the air and water consents have been verified and accepted. CL 9 is closed
CL 10: It is not clear from the PDD the following: - At what intervals are stakeholder consultation process carried out – PDD	G.1.2, 1.4, 1.5	Lafarge conducts stakeholder consultation meeting annually for its corporate reporting. One of such meeting dated 31 st August 2005 the	Complimentary information provided is accepted. Minutes of the meeting dated 31 st August provided has been verified. CL 10 is closed

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>indicates at periodic intervals?</p> <ul style="list-style-type: none">- When were the last two consultations carried out?- Did they cover all three sites?- What is the exact process of consultation adopted?- What were the comments received? <p>Evidence for all the above</p>		<p>CDM initiative in Lafarge was discussed. All benefits including environmental and social aspects were informed to participants of the meeting and know adverse comment has been recorded.</p> <p>Refer to MoM with signatures of the participants as supporting. (hard copy).</p>	

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