
VALIDATION OPINION FOR REVISION OF REGISTERED MONITORING PLAN

**Orient Cement (Props: Orient Paper &
Industries Limited)**

**“Blended cement with increased
blend” at Orient cement’s Devapur
and Jalgaon plants in India**

UNFCCC Ref. No. 0456

SGS Climate Change Programme

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Date of Issue:		Project Number:	
21-06-2012		CDM.VER0160. RMP	
Project Title:			
"Blended cement with increased blend" at Orient cement's Devapur and Jalgaon plants in India			
Organisation:		Client:	
SGS United Kingdom Limited		Orient Cement (Props: Orient Paper & Industries Limited)	
Subject:			
Validation Opinion for Revision of Registered Monitoring Plan:			
[X]	Proposed revision includes revisions proposed by the PP/DOE		Distribution/Document Control
	Proposed revision only includes the request by the CDM EB		
	Proposed revision includes not only request by the CDM EB but also additional revisions proposed by the PP/DOE		
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Date: 28-06-2012			
Revision Number:	Date:	Number of Pages:	
0	24-12-2011	24	
1	10-01-2012	25	
2	21-03-2012	26	
2.1	11-04-2012	29	
2.2	21-06-2012	29	

Abbreviations

BC	Blended Cement
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification Request
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
PDD	Project Design Document
PP	Project Participant
PPC	Portland Pozzolana Cement
RMP	Revised Monitoring Plan
TA	Technical Area
UNFCCC	United Nations Framework Convention on Climate Change
VR	Validation Report

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1. Validation Opinion

Paragraph 57 of the modalities and procedures for the CDM allows project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Orient Cement (Props: Orient Paper & Industries Limited) to perform such a validation of the revision of monitoring plan according to the procedure detailed in Annex 28 to EB 49 meeting report; the registered monitoring plan is part of the PDD of registered CDM project "Blended cement with increased blend" at Orient cement's Devapur and Jalgaon plants in India and UNFCCC ref. no. 0456. The purpose of a validation is to have an independent third party assessment of the revision of monitoring plan. In particular, the level of accuracy and/or completeness in the proposed revision of the monitoring plan, and the conformity with approved monitoring methodology applicable to the project activity.

By applying the proposed revision of monitoring plan, the baseline emission parameters (being monitored for baseline year 01/04/2001 to 31/03/2002 and validated by validating DOE at the time of project activity registration) are included in proposed revision in monitoring plan which result transparent and consistent approach for calculation of emission reduction as per applied monitoring methodology ACM0005, version 02 dated 28/11/2005. In addition to this, following editorial corrections have been made in proposed revision:-

- The parameters 'Ablend,_y ' and 'Pblend,_y' are included in table D.2.3.1 ,
- The nomenclature for data variable for ID No.6 and ID No.21 in Table D.2.1.1 is changed as P_clink and PBlend,y respectively,
- The nomenclature for data variable for ID No.6, ID No. 8 and ID No. 20 in Table D.2.1.3 is changed as B_clink, EFFi_BSL and BBlend,y respectively
- Repetition of one parameter (ID no. 18) in table D.2.1.3 is removed
- The addition of parameters from ID No. 21 to ID No. 30 is included in Table D.2.1.3
- The formula for Ly is added as per methodology ACM0005, version 02. The formula for Ladd_trans has been corrected in line with methodology. The word Qadd has been removed from parameter 4 of table 2.3.1 to make it consistent with methodology.
- The inclusion of Annexure 1 for baseline data, Annexure 2 for roles and responsibilities, Annexure 3 and 3A for Line diagram of monitoring equipments.

The above proposed revisions in monitoring plan will improving the level of accuracy and completeness in the monitoring and verification process which will results the transparency in the emission reduction calculation. The proposed revision in monitoring plan was recommended by verifying DOE through a FAR#4 raised during previous verification (monitoring period: 01/04/2008 to 31/03/2009) wherein the PP was requested to obtain prior approval from EB for said revision in monitoring plan before submission of next request for issuance.

This revision improves the accuracy of information provided and consistency in the registered PDD and the monitoring plan.

Furthermore, we confirm that:

- (a) the proposed revision points have been described, and an assessment has been provided to substantiate the reasons for each of the proposed revision points of the registered monitoring plan, using objective evidence;
- (b) the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions;
- (c) the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity whilst ensuring the conservativeness of the emission reductions calculation.
- (d) the findings of the previous verification report have been taken into account.

Signed on Behalf of the Validation Body by Authorized Signatory

Signature:

A handwritten signature in blue ink, appearing to read 'Siddharth', with a long horizontal stroke extending to the right.

Name: *Siddharth Yadav*

Date: 28-06-2012

2. Introduction

2.1 Objective

Paragraph 57 of the modalities and procedures for the CDM allows project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Orient Cement (Props: Orient Paper & Industries Limited) to perform such a validation of the revision of monitoring plan according to the procedure detailed in Annex 28 to EB 49 meeting report; the registered monitoring plan is part of the PDD of registered CDM project "Blended cement with increased blend" at Orient cement's Devapur and Jalgaon plants in India and UNFCCC Ref. Number 0456. The purpose of a validation is to have an independent third party assessment of the revision of monitoring plan. In particular, the level of accuracy or completeness in the proposed revision of the monitoring plan, and the conformity with the approved monitoring methodology applicable to the project activity.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM) and the host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

SGS reviewed the project design documentation (revised monitoring plan), using a risk based approach and conducted follow-up interviews.

2.2 Scope

The scope of the validation is defined as an independent and objective review of revision of monitoring plan. The information in these documents is reviewed against the Kyoto Protocol requirements, the UNFCCC rules and associated interpretations.

The validation is not meant to provide any consulting towards the Client/the project. However, SGS may issue requests for clarifications and/or corrective actions which may provide input for improvement of the project design.

2.3 GHG Project Description

Refer to <http://cdm.unfccc.int/Projects/DB/DNV-CUK1149668886.48/view> , the project web page. There is no change in the project activity description. The project was registered on 27th August 2006 under UNFCCC ref. no. 0456.

3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

A site visit was carried out to verify assumptions in the baseline on 19/09/2011, 20/09/2011 & 21/09/2011.

3.2 Use of the Validation Protocol

The validation protocol used for the assessment is partly based on the templates of the CDM Validation and Verification Manual version 1.2 (EB55 Annex.1):

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	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.	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.	This is either acceptable based on evidence provided (Y/OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

The validation protocol is attached with the report as Annex 1.

3.3 Findings

As an outcome of the validation process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **Clarification Request (CL)** specifying what additional information is required.

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR)**. A CAR is issued, where:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A Forward Action Request (FAR) is raised during verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a CL/FAR may result in a CAR. Information or clarifications provided as a result of a CL/FAR may also lead to a CAR.

Corrective Action Requests, Clarification Requests and Forward Action Requests are raised in the draft validation protocol and detailed in a separate form (Findings Overview). In this form, the Project Developer is given the opportunity to address and "close" outstanding CARs and respond to CLs and FARs. The detailed Finding Overview is attached with this document as Annex 2.

3.4 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

4. Validation Findings

4.1 Application of Monitoring Methodology and Monitoring Plan

Type of Revision:

During course of previous verification (monitoring period: 01/04/2008 to 31/03/2009)^{/9/} a FAR was raised by verifying DOE wherein the DOE/PP has identified improvement opportunity in monitoring and verification process, therefore the proposed revision of monitoring plan is recommendation by the PP & DOE. As per proposed revision in monitoring plan as mentioned in section D (Table D.2.1.1, Table D.2.1.3, Table D.2.3.1 Table D.2.3.2 and Table D.3)^{/1.3 and 2.3/}.

The proposed revision includes:

- (a) Table D.2.1.1: Correction in nomenclature of parameter ID no 06 and ID no 21 as P_clink and PBlend, y respectively
- (b) Table D.2.1.3: Correction in nomenclature of parameter ID no 06 and ID no 08 as B_clink and EFFi_BSL respectively
- (c) Table D.2.1.3: Deletion of repeating parameter ID no 18
- (d) Table D.2.1.3: Correction in nomenclature of parameter ID no 20 (revised ID no after deletion of repetitive parameter) as BBlend,y
- (e) Table D.2.1.3: Inclusion of following baseline parameters:
 - i) BC BSL
 - ii) BELEgrid_BC,BSL
 - iii) BELEsg_BC,BSL
 - iv) BELEgrid_ADD
 - v) BELEsg_ADD,BSL
 - vi) Fi,j,BSL
 - vii) COEF_{ij} BSL
 - viii) GEN_jBSL
 - ix) BEele_grid_ADD,BSL
 - x) BEele_sg_ADD,BSL
 - xi) CLNKBSL
- (f) Table D.2.3.1: Correction in nomenclature of parameter ID no 07 as Ay
- (g) Table D.2.3.1: Inclusion of following leakage parameters:
 - i) Ablend,y
 - ii) Pblend,y
- (h) Table D.2.3.2: Inclusion of formula to determine the leakage emissions per tonne of BC due to additional additives as per applied methodology ACM0005 Version 02 (Pg 7, eq. 2.1)^{/5/}.
- (i) Table D.3: Updating the table as per above corrections.
- (j) Inclusion of Annexure 1, 2, 3 & 3A in RMP.
- (k) The formula for L_{add_trans} has been corrected in line with methodology and the word Qadd has been removed from parameter 4 of table 2.3.1 to make it consistent with methodology.

The proposed revision of the monitoring plan ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revisions (details below).

- (a) **Table D.2.1.1: Correction in nomenclature of parameter ID no 06 and ID no 21 as P_clink and PBlend, y respectively**
The revision is editorial correction in nomenclature of parameter ID no 06 and ID no 21 as P_clink and PBlend, y respectively; under the "Data variable" in Table D.2.1.1 of proposed RMP^{/1.3 and 2.3/}. This was a typographical error in previous version of RMP^{/7/}, so same is corrected in proposed RMP^{/1.3 and 2.3/}.
- (b) **Table D.2.1.3: Correction in nomenclature of parameter ID no 06 and ID no 08 as B_clink and EFFi_BSL respectively**

The revision is editorial correction in nomenclature of parameter ID no 06 and ID no 08 as B_{clink} and EFF_{i,BSL} respectively; under the “Data variable” in Table D.2.1.3 of proposed RMP^{/1.3 and 2.3/}. This was a typographical error in previous version of RMP^{/7/}, so same is corrected in proposed RMP^{/1.3 and 2.3/}.

(c) Table D.2.1.3: Deletion of repeating parameter ID no 18

The revision is deletion of repeating parameter ID no 18 as “BE_{ele_sg_CLNK,BSL}” under Table D.2.1.3 of proposed RMP^{/1.3 and 2.3/}. This was a typographical error in previous version of RMP^{/7/}, so same is corrected in proposed RMP^{/1.3 and 2.3/}.

(d) Table D.2.1.3: Correction in nomenclature of parameter ID no 20 as BB_{blend,y}

The revision is editorial correction in nomenclature of parameter ID no 20 as BB_{blend,y} in “Data variable” under Table D.2.1.3 of proposed RMP^{/1.3 and 2.3/}. This was a typographical error in previous version of RMP^{/7/}, so same is corrected in proposed RMP^{/1.3 and 2.3/}.

(e) Table D.2.1.3: Inclusion of baseline parameters: The following baseline emission parameters (being monitored for baseline year 01/04/2001 to 31/03/2002 and validated by validating DOE at the time of project activity registration) are included in proposed revision in monitoring plan^{/1.3 and 2.3/}:

- i) BC_{BSL}
- ii) BE_{LEgrid_BC,BSL}
- iii) BE_{LEsg_BC,BSL}
- iv) BE_{LEgrid_ADD}
- v) BE_{LEsg_ADD,BSL}
- vi) Fi_{j,BSL}
- vii) COEF_{i,j,BSL}
- viii) GEN_{j,BSL}
- ix) BE_{ele_grid_ADD,BSL}
- x) BE_{ele_sg_ADD,BSL}
- xi) CLNK_{BSL}

This will result transparent and consistent approach for calculation of emission reduction as per applied monitoring methodology ACM0005, version 02 dated 28/11/2005^{/5/}.

(f) Table D.2.3.1: Correction in nomenclature of parameter ID no 07 as A_y

The revision is editorial correction in nomenclature of parameter ID no 07 as A_y in “Data variable” under Table D.2.1.1 of proposed RMP^{/1.3 and 2.3/}. This was a typographical error in previous version of RMP^{/7/}, so same is corrected in proposed RMP^{/1.3 and 2.3/}.

(g) Table D.2.3.1: Inclusion of following leakage parameters:

- i) **A_{blend,y}:** The parameter A_{blend,y} calculated in “tonne of additives/tonne of BC” is included in proposed revision. This parameter used for estimation of leakage due to project activity. This parameter is baseline benchmark share of additives per tonne of BC updated for year. The value of this parameter is ex-ante fixed for respective years.
- ii) **P_{blend,y}:** The parameter P_{blend,y} calculated in “tonne of additives/tonne of BC” is included in proposed revision. This parameter used for estimation of leakage due to project activity. This parameter is share of additives per tonne of BC in year y is actual data calculated from P_{blend,y} mentioned under equation 5 in page no. 8 of the applied methodology ACM0005, version 02 dated 28/11/2005^{/5/}.

(h) Table D.2.3.2: Inclusion of formula to determine the leakage emissions per tonne of BC due to additional additives as per applied methodology ACM0005 Version 02 (Pg 7, eq. 2.1)^{/5/}.

The revision is inclusion of formula to determine the leakage emissions per tonne of BC due to additional additives as per applied methodology ACM0005 Version 02 (Pg 7, eq. 2.1)^{/5/}. This was not mentioned in the previous version of approved RMP^{/7/}, so same is corrected in proposed RMP^{/1.3 and 2.3/}.

(i) Table D.3: Updating the table as per above corrections.

Based on above revision points {from (a) to (h)}; the Table D.3 in proposed RMP^{/1.3 and 2.3/} is updated. Same was checked and found consistent and accepted.

(j) Inclusion of Annexure 1, 2, 3 & 3A in RMP :

The proposed RMP include the Annexure 1 for baseline data for year 01/04/2001-31/03/2002, Annexure 2 for roles & responsibilities with organisation structure and Annexure 3 & 3A for Line

diagram of monitoring equipments. Same was checked and found to be correct and consistent, hence accepted.

(k) Correction of formula for Ladd_trans and correction of parameter ID no 04 of table 2.3.1 :

The formula for Ladd_trans has been corrected in line with methodology and the word Qadd has been removed from parameter 4 of table 2.3.1 to make it consistent with methodology.

The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity (details below).

The proposed revision in monitoring plan improving the level of accuracy and completeness in the monitoring and verification process which will result in a transparent and consistent approach for calculation of emission reduction as per applied monitoring methodology ACM0005, version 02 dated 28/11/2005. Hence, the proposed revision of the monitoring plan is in accordance with as per applied methodology ACM0005 Version 02^{5/}. This revision improves the accuracy of information provided and consistency in the registered PDD^{3/} and the monitoring plan. The proposed revision of the monitoring plan is a complete document containing details of all parameters with the applicable changes and in the same format similar as in the registered PDD^{3/}.

CAR#1 was raised to address the following corrections in RMP version 2 dated 07/11/2011:

1. PP was requested to clarify how the formula for Ladd_trans is in line with formula mentioned in methodology. In response, PP has corrected the formula in modified RMP. This has been checked and found to be correct as per applied version 02 of ACM0005 and hence, accepted.
2. PP was requested to clarify why symbol alpha y has been changed in explanation as Ay however formula have symbol alpha y, which is inconsistency. Also requested to correct the in table D.2.3.1. In response, PP has corrected the symbol in RMP and same was checked and found to be correct and consistent in RMP, hence accepted.
3. In section D.3, Table 2.1.2 is referred for QA/QC which should be table 2.1.3, therefore, PP was requested to clarify why I.D number 18 is not part of QA/QC and there are 30 parameters in table 2.1.3 and not 31. In response, PP has submitted the corrected RMP and same was checked and found to be appropriate, hence accepted.
4. The value of ID. 6 parameter quantity of clinker used for PPC production is mentioned as 5.568894, however previous verification excel has mentioned it as 1294 KT, therefore PP was requested to clarify it. Also requested to clarify the source for ID 6 parameter. In response, PP has clarified that the ID 6 (quantity of clinker used for PPC production in baseline) has been mentioned as 5.568894 KT. The value of 1294 KT, mentioned is the total clinker production figure in baseline year (2001-2002). Same was checked and found to be correct, hence accepted.
5. PP was requested to provide the roles & responsibility along with organisational structure in RMP. In response PP has provided the modified RMP. Same was checked and found that the Roles & Responsibilities with Organisation structure and Line diagram of monitoring equipments provided in Annexure 2, 3 & 3A of RMP. Hence accepted.

Furthermore, assessment team has re-opened the CAR#1 for below issue. The methodology describes the parameter CLNKBSL as annual production of clinker in the base year. However the revision of monitoring plan version 3 dated 19/03/2012 has two parameters i.e. CLNKBSL (Annual production of clinker in the base year) and CLNK_{BSL} (Quantity of clinker used for PPC production), with different values in Annexure 1 with similar looking symbols (CLNKBSL or with subscript BSL i.e. CLNK_{BSL}).

For clarity the RMP has been further revised wherein the nomenclature used for the baseline parameter "Quantity of clinker used for PPC production CLNK_{BSL}" this is revised as "B_click" This will avoid confusion on monitoring of two different parameters.

The assessment team verified the updated RMP and confirmed that the parameter CLNKBSL (ID no 31 of Table D.2.1.3) has been described as Annual production of clinker in the base year (in Kilo tonnes of clinker) as per the applied methodology ACM0005 version 02. The baseline value provided under ID No. 31 of Annexure-1 of the revised monitoring plan is 1295.338 kilo tonnes. This parameter was not mentioned in the previous approved RMP.

The parameter “Quantity of clinker used for PPC production CLNK_{BSL}” (ID no 6 under Table D.2.1.3) is measured and is used in calculation of share of additives per tonne of blended cement, another parameter ($P_{blend,y}$), which is used in the calculation of emissions due to leakage. This parameter was there in the registered PDD and previous approved RMP, thus this parameter has been kept in the revised monitoring plan, for better clarity and transparency in the overall emission reduction calculation process. The value of this parameter provided in the revised monitoring plan (5.568894 Kilo tonnes) is different from one provided for “annual production of clinker in base year” mentioned above.

In order to distinguish two different parameters (one is defined in the methodology and the other is in the registered PDD and previous approved RMP) different nomenclature has been used in revised latest version of RMP. The nomenclature of the baseline parameter “Quantity of clinker used for PPC production CLNK_{BSL}” has been revised as “B_clink” and the nomenclature of Annual production of clinker in the base year (in Kilo tonnes of clinker) was kept as CLNKBSL in revised RMP to avoid confusion on monitoring of two different parameters. Similarly, the nomenclature of the project activity parameter “Quantity of clinker used for PPC production CLNKy” was changed to “P_clink”. This avoids confusion which may arise from another parameter presented as “CLINKy” against ID.no.33 of table D 2.1.1 to define total quantity of clinker produced in the year y. This was found to be correct and hence accepted.

Sufficient information as discussed above, which has been provided by the PP has been duly verified by the assessment team and found to be satisfactory. The RMP has been reviewed and found to be correct. Thus, CAR#1 was closed.

4.2 Findings of Previous Verification Reports

The proposed revision in monitoring plan was recommended by verifying DOE in a FAR#4 raised in previous verification (monitoring period: 01/04/2008 to 31/03/2009)^{9/} wherein the PP was requested to obtain prior approval from EB for said revision of monitoring plan before submission of next request for issuance.

The below FAR#4 was raised in previous verification (monitoring period: 01/04/2008 to 31/03/2009)^{9/}:

Validation team has identified the improvement opportunities in monitoring plan and recommended to PP that the revision of monitoring plan is required prior to next verification due to following reason:

1. *The parameter ID no. 17 and 18 in table D.2.1.3 of RMP version 1.1 dated 31/08/2010 are identical, therefore repetition of parameter is need to be remove.*
2. *Following parameters were not mentioned in table D.2.1.3 of RMP version 1.1 dated 31/08/2010 :*
 - a. *BC BSL*
 - b. *BELEgrid_BC,BSL*
 - c. *BELEsg_BC,BSL*
 - d. *BELEgrid_ADD*
 - e. *BELEsg_ADD,BSL*
 - f. *Fi,j,BSL*
 - g. *COEFi,j BSL*
 - h. *GENj,BSL*
 - i. *BEele_grid_ADD,BSL*
 - j. *BEele_sg_ADD,BSL*

These baseline parameters are already monitored for baseline year and no need to further monitor however this needs to be mention as Baseline emission parameters as per methodology and being monitored for baseline year. Thus, these baseline parameters are needed to be included in monitoring plan.

3. *The parameters ‘Ablend_y ‘ and ‘Pblend_y’ were not mentioned in table D.2.1.1 of RMP version 1.1 dated 31/08/2010. These project parameters are needed to be monitored for CER calculation and being monitored from the beginning. Thus, these project parameters are needed to be included in monitoring plan.*

All the above parameters were used for the calculation of CERs; however it was not transparently discussed in the monitoring plan. For the calculation of baseline emissions, the above parameters were monitored for baseline year and did not have any impact on the CER calculation, however verification team for a better

transparency and to follow the methodology accurately recommended these parameters to be included in the monitoring plan. As all the monitored parameters are included in MR, ER sheet as well as discussed, validated and verified and the same has been presented transparently in this report. Therefore, the verification team has concluded the previous verification by raising a FAR# 4 wherein the PP has requested to be obtained prior to approval from EB for aforementioned revision of monitoring plan before submission of next request for issuance.

Thus the proposed revision of monitoring plan is included above all points and FAR of previous verification has been closed. Along with FAR, PP/DOE has recommended other revisions as discussed in above section.

5. List of Persons Interviewed

Date of site visit	Name	Position	Short description of subject discussed
19/09/2011 to 21/09/2011	Mr. V. V. Srinivas Kumar	Deputy Manager (Orient Cement)	<ol style="list-style-type: none"> 1. All revision points: Baseline Parameter, Leakage Parameter. 2. Emission reduction calculation and application of methodology. 3. Pervious verification issues as FAR#4. 4. Conformance with the monitoring methodology. 5. Monitoring and measurement systems (Data collection (calibration certificates), Data management (plant records) and data corroboration (archiving systems)).
	Mr. Ritwik Bhaumik	Consultant (PWC)	

6. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1/ Revised Monitoring Plan (Clean version)
 - /1.1./ Revised Monitoring Plan (Clean version) version 2 dated 07/11/2011
 - /1.2./ Revised Monitoring Plan (Clean version) version 3 dated 19/03/2012
 - /1.3./ Revised Monitoring Plan (Clean version) version 3.1 dated 18/06/2012 (Final)
- /2/ Revised Monitoring Plan (Track version)
 - /2.1./ Revised Monitoring Plan (Track version) version 2 dated 07/11/2011
 - /2.2./ Revised Monitoring Plan (Track version) version 3 dated 19/03/2012
 - /2.3./ Revised Monitoring Plan (Track version) version 3.1 dated 18/06/2012 (Final)

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /3/ Registered PDD version 03 dated 10/02/2006
- /4/ Validation Report, 12/05/2006
- /5/ ACM0005 version 02 dated 28/11/2005
- /6/ VVM version 1.2 EB 55 Annex 01
- /7/ UN0456.Revised Monitoring Plan (Clean version) version 1.1 dated 31/08/2010 and approved on 10/07/2010
- /8/ Validation Report for RMP version 1.1
- /9/ Verification Report for monitoring period 01/04/2008 to 31/03/2009



Annex 1: Validation Protocols

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
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Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.1. General Requirements				
A.1.1. Is the revision in the monitoring plan based on a decision by the CDM EB	EB49, Annex 29	DR	No	Y
A.1.2. Is the revision based on a decision by CDM EB but also additional revisions are proposed by the PP/DOE	EB49, Annex 29	DR	Yes, the revision in the monitoring plan is based on DOE's recommendation on previous verification report (covering monitoring period from 01/04/2008 to 31/03/2009). Also few additional revisions are proposed by PP/DOE.	Y
A.1.3. Is the need for revision in monitoring plan spotted during the first monitoring period?	EB49, Annex 29 Project page on UNFCCC website	DR	The revised monitoring plan makes the ER calculation approach more clear and transparent. Proposed revision is spotted during monitoring period from 01/04/2008 to 31/03/2009.	Y
A.1.4. Is the revised monitoring plan complete and does the revised monitoring plan follow the registered PDD template?	Registered PDD	DR	PP has submitted the revised monitoring plan in the appropriate template, same was used for registered PDD .The section D.2.1.1, and section D.3 of registered PDD has been amended according to proposed revision in monitoring plan.	Y
A.1.5. Has the revised monitoring plan submitted in track change mode for each of the revision point (issue)?	Revised monitoring plan	DR	PP has submitted the revised monitoring plan in the track change mode to DOE. The amendments are conspicuous and found as per the revision requirement. CAR#1 was raised 1. Please clarify how the formula for Ladd_trans is in line with formula mentioned in methodology. 2. Please clarify why symbol alpha y has been changed in explanation as Ay however formula have symbol alpha y, please clarify the inconsistency. Also same symbol is changed in table D.2.3.1, please clarify it. 3. In section D.3, Table 2.1.2 is referred for QA/QC which should table 2.1.3, please clarify why I.D number 18 is not part of QA/QC and there are 30 parameters in table 2.1.3 and not 31. 4. The value of ID. 6 parameter quantity of clinker used for PPC production is	CAR#1 was raised CAR#1 was closed Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
			<p>mentioned as 5.568894, However previous verification excel has mentioned it as 1294 KT, please clarify it. Also source of Lab Analysis Report is not clear for ID 6 parameter.</p> <p>5. The roles & responsibility along with organisational structure need to mention in RMP. Please provide the same.</p> <p>Sufficient information as discussed above, which has been provided by the PP has been duly verified by the assessment team and found to be satisfactory. The RMP has been reviewed and found to be correct. Thus, CAR#1 was closed.</p>	

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
A.1.6. Is there an objective evidence for each of the proposed revision point (issue)?		DR	Proposed revision is editorial corrections in previous approved RMP version 1.1. As the nature of revision is to provide transparency in emission reduction calculation and consistent approach as per applied methodology.	Y
A.1.7. Does the revised monitoring plan also include the Annex 4?	Registered PDD	DR	The RMP doesn't have an Annex 4 as the PP have included all the information in section D. The Annex 4 is also not a part of the registered PDD, as the section D covers the whole monitoring plan.	Y
A.1.8. Does the revised monitoring plan lead/associate to any kind of change in the project registered design?	Registered PDD & EB48 Annex 66-67	DR	Proposed revision in monitoring plan was checked with EB48 Annex 66 and 67, the proposed revision does not lead to any kind of change in the project registered design.	Y
A.2. Data and Parameters Monitored				
A.2.1. Does the revised monitoring plan in the PDD comply with the approved methodology provided for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	VVM Para. 91a/91d/121 Revised MP Section B.7 EB49, annex 2, para 9	DR	The revision in monitoring plan brings transparency and accuracy to the baseline data which was already validated at the time of project registration, while ensuring the conservativeness of the emission reductions calculation and is in compliance with the requirement of monitoring methodology ACM 0005 version 02.	Y
A.2.2. Are the changes in the monitoring plan inline to the applied methodology and tool?	ACM 0005 version 02	DR	The changes in the monitoring plan are in-line with the approved monitoring methodology ACM0005 version 02 which was used in the registered PDD.	Y
A.2.3. Are the changes affecting the ER calculation (directly/indirectly)?	Revised MP	DR	The proposed revision is included the addition of baseline parameters and leakage parameter in approved revised monitoring plan version 1.1 dated 31/08/2010. The revision in monitoring plan brings transparency and accuracy in emission reduction calculation.	Y
A.2.4. Is the information given for each	RMP Section	DR	The proposed revisions in monitoring plan are representing in table D.2.1.1, D.2.1.3, D.2.3.1, D.2.3.2 & D.3 of PDD and also Annexure 1,2,3 and 3A included, the	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	B.7		parameters related to this revision are compliance with the sufficient information describing the intentions of the project participants is detailed enough to assess the appropriateness.	
A.2.5. Has there been an issuance with the original monitoring plan of the registered PDD in the past? A.2.6. if so how did the identified gaps effect the ER calculations for the monitoring periods in the past?	Project page on UNFCCC website	DR	Project activity was registered on 27/08/2006. There are three issuances has been happened with the original monitoring plan of the registered PDD in the past and one with approved revised monitoring plan version 1.1 dated 31/08/2010. The proposed revision in monitoring plan brings transparency and accuracy to the data to be monitored by revision/elimination/inclusion of more specific, appropriate and missed baseline & leakage parameters, while ensuring the conservativeness of the emission reductions calculation and is in compliance with the requirement of monitoring methodology ACM 0005 version 02. The proposed revision in the monitoring plan is based on DOE's recommendation on previous verification report (covering monitoring period from 01/04/2008 to 31/03/2009).	Y
A.2.7. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	RMP Section – B.7	DR	The proposed revisions in monitoring plan are representing in table D.2.1.1, D.2.1.3. D.2.3.1, D.2.3.2 & D.3 of PDD and also Annexure 1,2,3 and 3A included, the baseline and leakage parameters related to this revision are in compliance with the sufficient information describing the delivery of high quality data free of potential for biases or intended or unintended changes in data records.	Y
A.2.8. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	RMP Section- B.7	DR	The proposed revisions in monitoring plan are representing in table D.2.1.1, D.2.1.3. D.2.3.1, D.2.3.2 & D.3 of PDD and also Annexure 1, 2, 3 and 3A included, the baseline and leakage parameters related to this revision are already fixed at the time of validation.	Y
A.2.9. Are all formulae used to determine project emission clearly indicated and in	Revised MP Section -B.7	DR	The formula to determine the leakage emissions per tonne of BC due to additional additives as per applied methodology ACM0005 Version 02 (Pg 7, eq. 2.1). This was not mentioned in the previous version of RMP, so same is corrected in proposed RMP.	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
compliance with the monitoring methodology.				
A.3. Quality Control (QC) and Quality Assurance (QA) Procedures				
A.3.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	VVM Para. 121	DR	The proposed revisions in monitoring plan are representing in table D.2.1.1, D.2.1.3. D.2.3.1, D.2.3.2 & D.3 of PDD and also Annexure 1, 2, 3 and 3A included, the baseline and leakage parameters related to this revision are already fixed at the time of validation.	Y
A.3.2. in case, a revision is proposed, the impact of the revision should be assessed and it not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9	DR	The proposed revision in monitoring plan is improving the level of accuracy and completeness in the monitoring and verification process.	Y
A.3.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	VVM Para 121	DR	The baseline and leakage parameters related to this revision are already fixed at the time of validation.	Y
A.3.4. Is it ensured that data will be bound to national or internal reference standards?	VVM Para. 86d	DR	The baseline and leakage parameters related to this revision are already fixed at the time of validation.	Y
A.4. Operational and Management Structure				
A.4.1. Is the authority and responsibility of project management clearly	PDD Section B.7.2 /Annex 4	DR	Pending CAR#1. The role and responsibilities along with organizational structure included in RMP	Pending CAR#1 Closed

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
described?				Y
A.4.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Section B.7.2/Annex 4	DR	Pending CAR#1. The role and responsibilities along with organizational structure included in RMP. Same was checked and found to be acceptable.	Pending CAR#1 Closed Y
A.5. Monitoring Plan (Annex 4)				
A.5.1. Does the monitoring plan completely describe all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	VVM Para. 122b	DR	The monitoring plan has been described fully in section D of the registered PDD as well as in the RMP. The PDD doesn't have an Annex 4 as the PP have included all the information in section D.	Y
A.5.2. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	VVM Para. 122b	DR	The information of each monitoring equipment involved in monitoring process are presented in Annexure-3 and 3 A of the RMP. Same was verified during site visit and found to be correct and hence accepted.	Y
A.5.3. Is there any change proposed in the specifications of the monitoring equipment or their positioning or installation then the impact of the change due to revision should be assessed and it not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9	DR	Not applicable, as proposed RMP is related to baseline and leakage parameters which are already fixed at the time of validation.	Y
A.5.4. Are procedures identified for	VVM Para.	DR	Not applicable, as proposed RMP is related to baseline and leakage parameters which	Y

Checklist Question	Reference	MoV*	Comments	Conclusion/ CARs/CLs
calibration of monitoring equipment?	122a-c		are already fixed at the time of validation.	
A.5.5. Is there any change proposed in the calibration procedures, if yes then the impact of the change due to revision should not result in reduced level of accuracy and completeness in the monitoring and verification process	EB49, annex 2, para 9	DR	Not applicable, as proposed RMP is related to baseline and leakage parameters which are already fixed at the time of validation.	Y
A.5.6. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	VVM Para. 122a-c	DR	Not applicable, as proposed RMP is related to baseline and leakage parameters which are already fixed at the time of validation.	Y
A.5.7. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	VVM Para. 122a-c	DR	Not applicable, as proposed RMP is related to baseline and leakage parameters which are already fixed at the time of validation.	Y

Annex 2: Overview of Findings

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	01	00	00

Date:	24/02/2012	Raised by:	Assessment Team		
Type:	CAR	Number:	01	Reference:	AU4
Lead Assessor Comment:			Date: 24/02/2012		
<div>1. Please clarify how the formula for Ladd_trans is in line with formula mentioned in methodology.</div> <div>2. Please clarify why symbol alpha y has been changed in explanation as Ay however formula have symbol alpha y, please clarify the inconsistency. Also same symbol is changed in table D.2.3.1, please clarify it.</div> <div>3. In section D.3, Table 2.1.2 is referred for QA/QC which should table 2.1.3, please clarify why I.D number 18 is not part of QA/QC and there are 30 parameters in table 2.1.3 and not 31.</div> <div>4. The value of ID. 6 parameter quantity of clinker used for PPC production is mentioned as 5.568894, However previous verification excel has mentioned it as 1294 KT, please clarify it. Also source of Lab Analysis Report is not clear for ID 6 parameter.</div> <div>5. The roles & responsibility along with organisational structure need to mention in RMP. Please provide the same.</div>					
Project Participant Response:			Date: 19/03/2012		
<div>1. Formula for Ladd_trans has been corrected in the revised MP in line with the methodology. Please check equation no 3 in the monitoring plan.</div> <div>2. In all relevant places the symbol has been corrected as αy</div> <div>3. Table 2.1.2 mentioned under section D.3 has been corrected as table 2.1.3. I.D. number 18 is part of QA/QC and there are 30 parameters in table 2.1.3.</div> <div>4. Please note that ID 6 (quantity of clinker used for PPC production in baseline) has been mentioned as 5.568894 Kt in all previous year CER calculation, including last year. The value 1294 KT, mentioned above is actually the total clinker production figure in baseline year (2001-2002).</div> <div>5. Roles & Responsibilities with Organisation structure and Line diagram of monitoring equipments provided in Annexure 2, 3 & 3A of RMP</div>					
Documentation Provided as Evidence by Project Participant:					
Revised Monitoring Plan version 3 dated 19/03/2012					
Information Verified by Lead Assessor:					
<div>1. PP has corrected the Formula for Ladd_trans in the revised MP and same was checked and found in line with the methodology.</div> <div>2. The symbol has been corrected as αy in RMP.</div> <div>3. The number is corrected as table 2.1.3 in RMP. The I.D. number 18 is now part of QA/QC and number of parameters is now corrected in table 2.1.3.</div> <div>4. The ID 6 (quantity of clinker used for PPC production in baseline) has been mentioned as 5.568894 KT. The value of 1294 KT, mentioned above is actually the total clinker production figure in baseline year (2001-2002). Same was checked and found to be correct.</div> <div>5. Roles & Responsibilities with Organisation structure and Line diagram of monitoring equipments provided in Annexure 2, 3 & 3A of RMP. Same was checked and found to be correct.</div>					
Reasoning for not Acceptance or Acceptance and Close Out:					

Sufficient information as discussed above, which has been provided by the PP has been duly verified by the assessment team and found to be satisfactory. The RMP has been reviewed and found to be correct. However please address the below issue:

The methodology describes the parameter CLNKBSL as annual production of clinker in the base year. However, the revision of monitoring plan has two parameters, i.e. CLNKBSL (Annual production of clinker in the base year) and CLNK_{BSL} (Quantity of clinker used for PPC production) with different values in Annexure 1 with similar looking symbols (CLNKBSL or with subscript BSL i.e. CLNK_{BSL}). This is not transparent and leads to confusing, thus, CAR#1 is re-opening for further clarification from PP.

Acceptance and Close out by Lead Assessor: Open **Date: 14/06/2012**

Project Participant Response: **Date: 18/06/2012**

CLNKBSL has been described as Annual production of clinker in the base year (in Kilo tonnes of clinker) in the methodology applied in our project (ACM005/Version 02; 28th November 2005). In line with this methodology we have incorporated the same parameter (CLNKBSL) in this revised monitoring plan (ID no. 31 under Table D.2.1.3 for baseline data) submitted to DOE. The baseline value provided under ID no. 31 of Annexure-1 of the revised monitoring plan is 1295.338 kilo tonnes. However this parameter was not mentioned in the monitoring plan of the registered PDD.

In addition to this we had incorporated another parameter to define and monitor the quantity of clinker used for PPC production (in kilo tonnes) in baseline and presented as "Quantity of clinker used for PPC production CLNK_{BSL}" in this revised monitoring plan (ID no. 6 under Table D.2.1.3 for baseline data) submitted to DOE.

We agree that this parameter has not been described in the methodology (ACM005/Version 02; 28th November 2005) we have applied in our project. This parameter is measured and is used in calculation of share of additives per tonne of blended cement, another parameter ($P_{blend,y}$), which is used in calculation of emission due to leakage. This parameter was there in the registered PDD (ID. No. 6 under table D.2.1.3 of the registered PDD) and we decided to keep it in the revised monitoring plan submitted to DOE, for better clarity and transparency in overall emission reduction calculation process. Hence the value of this parameter provided in the revised monitoring plan (5.568894 Kilo tonnes) is different from one provided for annual production of clinker in base year mentioned above.

We agree that two different parameters (one is defined in the methodology and the other is not) with different values have been presented with similar look symbols (CLNKBSL) and has led to this confusion. Hence decided to change the symbol "Quantity of clinker used for PPC production CLNK_{BSL}" with "B_clink" which will define the quantity of clinker used for PPC production in baseline.

Further to above changes made to address the observation by CDM EB, we have also made another change in the symbol of the parameter mentioned against ID. no. 6 of table no. D 2.1.1 to define Quantity of clinker used for PPC production in project scenario. We have changed the symbol of this parameter from "Quantity of clinker used for PPC production CLNK_y" to "P_clink" to avoid any confusion which may arise from another parameter presented as "CLINK_y" against ID.no.33 of table D 2.1.1 to define total quantity of clinker produced in the year y. This change in the revised monitoring plan has been made for further clarity and better understanding of the monitoring plan and avoids any confusion which may arise from similar looking symbols defining different parameters at different scenarios.

Documentation Provided as Evidence by Project Participant:

Revised monitoring plan with corrections as mentioned above.

Information Verified by Lead Assessor:

PP has submitted the updated RMP with correction of symbol of "Quantity of clinker used for PPC production CLNK_{BSL}" and "Quantity of clinker used for PPC production CLNK_y".

Reasoning for not Acceptance or Acceptance and Close Out:

The nomenclature of the parameter "Quantity of clinker used for PPC production CLNK_{BSL}" is revised as "B_clink" in updated RMP to avoid confusion on monitoring of two different parameters. Similarly, the nomenclature of the project activity parameter "Quantity of clinker used for PPC production CLNK_y" to "P_clink". This was found to be correct and hence accepted. Thus, CAR#01 closed.

Acceptance and Close out by Lead Assessor: Closed **Date: 21/06/2012**

7. Annex 3: Statement of Competence

Statement of Competence

Name: Vivek
Ahirwar

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): <i>TA 1.2 Energy generation from renewable energy sources</i>	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 06/02/2012

Statement of Competence

Name: Kartar,
Narang

Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable) Technical Area(s):	<input type="checkbox"/>
2. Energy Distribution Technical Area(s):	<input type="checkbox"/>
3. Energy Demand Technical Area(s):	<input type="checkbox"/>
4. Manufacturing Technical Area(s): <i>TA4.1 Cement sector</i>	<input checked="" type="checkbox"/>
5. Chemical Industry Technical Area(s):	<input type="checkbox"/>
6. Construction Technical Area(s):	<input type="checkbox"/>
7. Transport Technical Area(s):	<input type="checkbox"/>
8. Mining/Mineral Production Technical Area(s):	<input type="checkbox"/>
9. Metal Production Technical Area(s):	<input type="checkbox"/>
10. Fugitive Emissions from Fuels (solid, oil and gas) Technical Area(s):	<input type="checkbox"/>
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride Technical Area(s):	<input type="checkbox"/>
12. Solvent Use Technical Area(s):	<input type="checkbox"/>
13. Waste Handling and Disposal Technical Area(s):	<input type="checkbox"/>
14. Afforestation and Reforestation Technical Area(s):	<input type="checkbox"/>
15. Agriculture Technical Area(s):	<input type="checkbox"/>

Approved Member of Staff by: Siddharth Yadav Date: 29/02/2012

Statement of Competence

Name: Ramkrishna Patil

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
2. Energy Distribution	x
Technical Area(s): TA 2.1 Electricity distribution TA 2.2 Heat distribution	
3. Energy Demand	x
Technical Area(s): TA 3.1 Energy Demand	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 22/02/2012

Statement of Competence

Name: Naveen
Sharma

Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>
Technical Area(s):	
2. Energy Distribution	<input type="checkbox"/>
Technical Area(s):	
3. Energy Demand	<input type="checkbox"/>
Technical Area(s):	
4. Manufacturing	<input checked="" type="checkbox"/>
Technical Area(s): 4.1 Cement sector	
5. Chemical Industry	<input type="checkbox"/>
Technical Area(s):	
6. Construction	<input type="checkbox"/>
Technical Area(s):	
7. Transport	<input type="checkbox"/>
Technical Area(s):	
8. Mining/Mineral Production	<input type="checkbox"/>
Technical Area(s):	
9. Metal Production	<input type="checkbox"/>
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
Technical Area(s):	
12. Solvent Use	<input type="checkbox"/>
Technical Area(s):	
13. Waste Handling and Disposal	<input type="checkbox"/>
Technical Area(s):	
14. Afforestation and Reforestation	<input type="checkbox"/>
Technical Area(s):	
15. Agriculture	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by: Siddharth
Yadav Date: 29/02/2012