



Draft Validation report form for renewal of crediting period for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for renewal of crediting period for CDM project activities" at the end of this form.

DRAFT VALIDATION REPORT FOR RENEWAL OF CREDITING PERIOD (RCP)

Title of the project activity	Fertinal Nitrous Oxide Abatement Project
Reference number of the project activity	UNFCCC ref no - 2585
Number and duration of the next crediting period	2, 17/10/2016-16/10/2023
Version number of the validation report for RCP	01
Completion date of the validation report for RCP	28/04/2016
Version number of PDD to which this report applies	1.0
Project participant(s)	04/04/2016
Host Party	Mexico
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Scope 5 ACM0019: "N ₂ O abatement from nitric acid production" (Version 02.0)
Estimated annual average GHG emission reductions or net anthropogenic GHG removals in the next crediting period	249,670 t CO ₂ e/ year
Name of DOE	Carbon Check (India) Private Ltd.
Name, position and signature of the approver of the validation report for RCP	

SECTION A. Executive summary

The validation team assigned by the DOE has been assigned by “Impulso Ecologico y Desarrollo Sustentable, SA de CV” to perform the validation of Renewal of Crediting Period for the project “Fertinal Nitrous Oxide Abatement Project”, UNFCCC registration No. 2585. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism. The scope of the validation is defined as an independent and objective review of the project design document, the validity of methodology used, the project’s baseline study, estimated emission reductions and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM Validation and Verification Standard (Version 09.0), Kyoto Protocol requirements, CDM Executive Board/UNFCCC rules.

The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, stakeholder interviews, review of the applicable methodology and its underlying formulae and calculations.

Inline with the requirements of § 298 of PS, version 09.0, the Project participants had notified the UNFCCC secretariat of their intention in accordance with the Project cycle procedure. This has been done in accordance with § 291 of PCP version 09.0 as verified by reviewing the email /13/ sent by the project participant to the UNFCCC.

Validation team confirms that project participants ‘s names of the project participants included in the request for renewal of crediting period are same as reflected in the original PDD and the UNFCCC interface. The PP from the host country is the same as the original PDD, however the PP from annex 1 party has been changed as listed in the original PDD. Nonetheless, this change in PP of annex 1 party has been transparently listed in the UNFCCC project page. The approval and authorization of new PP of annex 1 party i.e. Nordic Environment Finance Corporation has been confirmed through the project page by reviewing the upaloded letter of approval from Finland.

Validation methodology and process

The validation has been performed as described in the VVS version 9.0 and constitutes the following steps:

- Desk review of the registered PDD on the UNFCCC website
- Desk review of the revised PDD and the relevant documents
- Follow-up Interviews
- Issuance of Validation Report

Validation criteria

The following CDM requirements have been considered:

- Article 12 of the Kyoto Protocol,
- Modalities and procedures for CDM (Marrakech Accords) Para 49(a)
- Subsequent decisions by the COP/MOP and CDM Executive Board
- Host country criteria (National and/or Sectoral policies)
- Criteria given to provide for consistent project operations, monitoring and reporting.

The project correctly applies the baseline and applicable monitoring methodology ACM0019: “N2O abatement from nitric acid production” (Version 02.0) /08/.

The project results in reductions of CO₂ equivalent emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is continued to be not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is CCIPL's opinion that the project participants are able to monitor as per the monitoring plan.

The total emission reductions from the project are estimated to be 243,794 t of CO₂e over a 7-year crediting period, averaging 243,794 t of CO₂e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not alter.

The validation protocol describes total of (05) findings, which include:

- (02) Corrective Action Requests (CARs);
- (03) Clarification Requests (CLs);
- (05) Forward Action Requests (FARs); and all findings are closed.

CCIPL concludes that the CDM Project Activity "Fertinal Nitrous Oxide Abatement Project" in Mexico, as described in the PDD /01/, meets (subject to closure of all findings) all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) Para 49 (a) and the subsequent decisions by the COP/MOP and CDM Executive Board. The selected baseline and monitoring methodologies (ACM0019, Version 02.0) are applicable to the project and correctly applied. The CCIPL therefore requests the approval of the renewal of the crediting period for the registered CDM project with UNFCCC

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader / Validator / Technical Expert	IR	Agarwalla	Sanjay	CCIPL	X	X	X	X
2.	Validator	IR	Sharma	Kranav	CCIPL	X			
3.	Local Expert	EI	Carter	Francisco Acuña	CCIPL		X	X	

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Singh	Vikash Kumar	CCIPL
2.	Technical reviewer (expert to TR)	EI	Nesari	R. V.	CCIPL
3.	Approver	IR	Anand	Amit	CCIPL

SECTION C. Means of validation**C.1. Desk review**

List of all documents reviewed or referenced during the validation is provided in Appendix 3.

C.2. On-site inspection

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
1.	NA			
...				

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.				web/teleconferences		
2.				web/teleconferences		

C.4. Clarification requests, corrective action requests and forward action requests raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	--	01	--
Application of baseline and monitoring methodology and standardized baseline	02		--
Validity of original baseline or its update	--	--	--
Estimated GHG emission reductions or net anthropogenic GHG removals	01		--
Validity of monitoring plan	--	01	--
Crediting period	--	--	--
Project participants	--	--	--
Others (please specify)	--	--	--
Total	03	02	--

SECTION D. Validation findings**D.1. Compliance with PDD form**

Means of validation	DR, I
Findings	Refer CAR-01
Conclusion	<p>The project participant has used a later valid version of the PDD form for the updated PDD than the version of the PDD form of the registered PDD. CCIPL confirms that the information transferred to the later valid version of the form is materially the same (subject to closure of CAR-01) as that in the registered PDD.</p> <p>CC IPL further confirms that the project participants have updated sections of the PDD relating to the baseline, estimated GHG emission reductions the monitoring plan and the crediting period using the valid version(s) of the approved baseline and monitoring methodology i.e. ACM0019, version 02.0 "N2O abatement from nitric acid production" /08/ along with Version 02.0.0 of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream /10/.</p>

D.2. Application of baseline and monitoring methodology and standardized baseline

Means of validation	DR, I
Findings	Refer CL-01 and CL -02
Conclusion	<p>The project was originally registered under AM0034, version 02 /07/. This methodology is not active anymore and has been replaced by ACM0019. Thus the request of renewal of crediting period of the project has been correctly made under the baseline and monitoring methodology ACM0019, version 02.0 "N2O abatement from nitric acid production" /08/ along with Version 02.0.0 of the "Tool to determine</p>

	<p>the mass flow of a greenhouse gas in a gaseous stream /10/.</p> <p><u>Assessment of the applicability of the applied methodology:</u></p> <p>The chosen baseline methodology is applicable (subject to closure of CL-01 and CL-02) to the project activity as justified below and verified by reviewing the registered PDD of the project /04/, validation report /04/ , the updated PDD /01/, and verification reports for the monitoring periods during the first crediting period /05/. The assessment of the project's compliance with the applicability criteria of ACM0019 (version 02.0) are detailed below:</p> <ul style="list-style-type: none"> ✓ The project activity introduces N₂O abatement measures in a nitric acid plant. The project activity involves the installation of a secondary catalyst to abate N₂O inside the reactor once it is formed. This criteria has been checked by reviewing the registered PDD of the project /04/, validation report /04/, the updated PDD /01/, and verification reports for the monitoring periods during the first crediting period /05/. ✓ The nitric acid plant started commercial operation before the implementation of the CDM project activity. There was no secondary or tertiary abatement technology installed in the respective nitric acid plant. The project is a registered CDM project activity and this has been confirmed during validation of the original project design document. CCIPL confirms this applicability criteria from the review of the validation report. ✓ Review of the registered PDD of the project /04/, validation report /04/ and the updated PDD /01/ and verification reports for the monitoring periods during the first crediting period /05/ reveals that continuous real-time measurements of the N₂O concentration and the total gas volume flow has been carried out in the tail gas stream after the abatement of N₂O emissions throughout the crediting period of the project activity. An Automated Measuring System (AMS) was installed, this is confirmed through review of snap-shot of AMS as attached in the updated PDD (section A.3) /01/. The PDD refers to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" and its provisions that would be applied, which when fully adopted would ensure this applicability criteria. ✓ Review of the registered PDD of the project /04/, validation report /04/ and the updated PDD /01/ reveals that no (subject to closure of CL-01) law or regulation which mandates the complete or partial destruction of N₂O from nitric acid plants exists in the host country (Mexico) where the CDM project activity is implemented. This was further confirmed through email confirmation from DNA of Mexico /14/ (confirmation still awaited).
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D.3. Validity of original baseline or its update

Means of validation	DR, I
Findings	Subject to closure of CL-01 above.
Conclusion	<p>As per the methodology ACM0019, version 02.0 /08/, the baseline scenario is that the N₂O is emitted to the atmosphere with no N₂O abatement measure being implemented. This is actually the updated baseline, which is also aligned with the originally established baseline.</p> <p>As per the VVS /03/, CCIPL has assessed the validity of the updated baseline through an assessment of the following:</p> <p>Step 1: Assess the validity of the current baseline for the next-crediting period:</p> <p>The assessment is carried out by the CCIPL's validation team to assess the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the registered baseline GHG emissions, without reassessing the baseline scenario.</p> <p>Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies:</p>

<p>Does the present chosen baseline in the renewal crediting period PDD complies with the relevant mandatory national and/or sectoral policies</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Validation team confirms that the baseline scenario for the project is the that the N₂O is emitted to the atmosphere with no N₂O abatement measure being implemented. The present chosen baseline in the renewal of crediting period of PDD complies with the relevant mandatory national and/or sectoral policies. This conclusion has been made based on the fact that no (subject to closure of CL-01) regulations or contractual requirements, prescribing complete or partial abatement of N₂O thereof, exist currently in Mexico.</p>
<p>If «NO» above → are these national and/or sectoral policies enforced and commonly practiced in the region/country?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>NA</p>

Step 1.2: Assess the impact of circumstances:

As per the registered PDD, the methodology used was AM0034 ver. 3 – Catalytic reduction of N₂O inside the ammonia burner of nitric acid plants and the baseline was identified, as the scenario where the N₂O is emitted to the atmosphere with no N₂O abatement measure being implemented. The Methodology AM0034 ver. 3 1 prescribes the baseline as atmospheric release of the N₂O. This methodology was subsequently replaced by ACM0019: “N2O abatement from nitric acid production” (Version 02.0). PP has correctly applied the applicable and valid methodology at the time of renewal of crediting period i.e. ACM0019. This is incompliance with the requirement of § 300 (b) of PS, version 09.0. Baseline as per the adoption of ACM0019, version 02.0, would remain the same i.e. the atmospheric release of the N₂O with no N₂O abatement measure being implemented. Thus it can be concluded that there are no circumstances for the revised PDD, which affects the baseline of the project.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested:

Validation team confirms that the baseline scenario for the project is the atmospheric release of the N₂O with no N₂O abatement measure being implemented. This conclusion has been made based on the fact that no regulations (subject to closure of CL-01) or contractual requirements, prescribing complete or partial abatement of N₂O thereof, exist currently in Mexico.

Validation team confirms that the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

Step 1.4: Assessment of the validity of the data and parameters:

Data and parameters have been updated due to the adoption of ACM0019, version 02.0.

Step 2: update the current baseline and the data and parameters:

NA

Step 2.1 update the current baseline:

	<p>NA</p> <p>Step 2.2 update the data and parameters:</p> <p>Data and parameters have been updated due to the adoption of ACM0019, version 02.0.</p> <p>Finally, following the previous explanation, it is in CCIPL's opinion that the current baseline complies with all relevant mandatory national and/or sectorial policies which have come into effect after the submission of the project activity for validation or the submission of the previous request for renewal of the crediting period and are applicable at the time of requesting renewal of the crediting period.</p> <p>As confirmed (confirmation still awaited) by DNA /14/ and through web-research of Environmental agency of Mexico, there are no mandatory (subject to closure of CL-01) national and/or sectorial policies affecting the baseline scenario and there is "No law or regulation which mandates the complete or partial destruction of N₂O from nitric acid plants exists in the host country where the CDM project activity is implemented."</p> <p>As per the methodology ACM0019 Version 02.0, the baseline scenario is that the N₂O is emitted to the atmosphere with no N₂O abatement measure being implemented.</p>
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D.4. Estimated GHG emission reductions or net anthropogenic GHG removals

Means of validation	DR,I
Findings	--
Conclusion	<p>The GHG emission reduction calculation spread sheet /02/ has been checked by CCIPL based on the approved methodology ACM0019 (version 02.0) /08/ and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 02.0.0) /10/.</p> <p>According to the methodology ACM0019 (version 02.0), any leakage emission sources are considered negligible. Hence, the emission reductions by the project activity in the crediting period are equal to the baseline emission reductions minus project emissions.</p> <p>$ER_y = BE_y - PE_y$</p> <p>Baseline emissions (Be_y Calculation of baseline emissions</p> <p>For calculating the baseline emissions <i>equation 1</i> of ACM0019 will be applied since it is applicable for projects that have used AM0034 during the first crediting period</p> $BE_y = \left(\frac{\min(P_{production,y}, P_{production,max}) \times EF_{nitric\ acid}}{\max(P_{production,y}, P_{production,max}) \times EF_{nitric\ acid}} \right) \times \frac{(10_y - 10_{20})}{10_y} \times GWFP_{N_2O} \times 10^{-3}$ <p>Where,</p> <p>BE_y = Baseline emissions in year y (t CO₂e)</p> <p>$P_{production,max}$ = Design capacity (t HNO₃)</p> <p>$P_{production,y}$ = Production of nitric acid in year y (t HNO₃)</p>

- $EF_{existing,y}$ = N₂O emission factor for nitric acid plants that have used AM0028 or AM0034 in the first crediting period in year y (kg N₂O/t HNO₃)
- $EF_{new,y}$ = Baseline N₂O emission factor for nitric acid production in year y (kg N₂O/t HNO₃)
- GWP_{N_2O} = Global Warming Potential of N₂O valid for the commitment period
- h_y = Number of hours in year y during which the plant was in operation (h)
- $h_{r,y}$ = Number of hours (h) in year y where:
 - (a) For secondary N₂O abatement: the abatement system was not installed, underperforming or failed;
 - (b) For tertiary N₂O abatement: the abatement system is by-passed, underperforming or failed

The N₂O emission factor for nitric acid plants that have used AM0028 and AM0034 in the first crediting period ($EF_{existing,y}$) will be calculated as follows:

$$EF_{existing,y} = \min\{EF_{historical}, EF_{default,y}\}$$

Where:

- $EF_{existing,y}$ = N₂O emission factor for nitric acid plants that have used AM0028 or AM0034 in the first crediting period in year y (kg N₂O/t HNO₃)
- $EF_{historical}$ = Historical baseline emission factor of the nitric acid plant (kg N₂O/t HNO₃)
- $EF_{default,y}$ = Default emission factor according to the operating pressure of the ammonia burner in year y (kg N₂O/t HNO₃)

Calculation of $h_{r,y}$

An abatement system is deemed to be bypassed, not working, underperform or failed in the hour h in year y if:

Case 1: For nitric acid plants that have used AM0028 or AM0034 in the first crediting period

$$F_{N_2O,act,h} > EF_{existing,y} \times P_{NH_3}$$

Where:

- $P_{NH_3,h}$ = Nitric acid produced in the hour h (t HNO₃)

- $EF_{\text{secondary},y}$ = Default N₂O emission factor for nitric acid plants that have used AM0028 or AM0034 in the first crediting period in year y (kg N₂O/t HNO₃)
- $F_{N2O,tail\ gas,h}$ = Mass flow of N₂O in the gaseous stream of the tail gas in the hour h (kg N₂O/h)

Project emissions

Project emissions include emissions of N₂O which have not been destroyed by the project activity and, in case of the installation of a tertiary N₂O abatement facility, CO₂ emissions resulting from the operation of the N₂O abatement facility.

Project emissions are calculated as follows:

$$PE_y = PE_{N2O,y} + PE_{CO2,tertiary,y}$$

Where:

- PE_y = Project emissions in year y (t CO₂e)
- $PE_{N2O,y}$ = Project emissions of N₂O from the project plant in year y (t CO₂e)
- $PE_{CO2,tertiary,y}$ = Project emissions of CO₂ from the operation of the tertiary abatement facility in year y (t CO₂)

Project emissions of N₂O from the project plant ($PE_{N2O,y}$)

The amount of N₂O emissions from the project activity are the emissions from the N₂O contained in the tail gas stream of the plant which is released to the atmosphere.

Accordingly, $PE_{N2O,y}$ is determined as follows:

$$PE_{N2O,y} = \sum_{h=1}^{h_{t,y}} F_{N2O,tail\ gas,h} \times GWP_{N2O} \times 10^{-3}$$

Where:

- $PE_{N2O,y}$ = Project emissions of N₂O from the project plant in year y (t CO₂e)
- GWP_{N2O} = Global warming potential of N₂O valid for the commitment period
- $F_{N2O,tail\ gas,h}$ = Mass flow of N₂O in the gaseous stream of the tail gas in the hour h (kg N₂O/h)
- $h_{t,y}$ = Number of hours in year y during which the plant was in operation
- $h_{u,y}$ = Number of hours (h) in year y where:
 - (a) For secondary N₂O abatement. Abatement system installed, underperforming or failed;
 - (b) For tertiary N₂O abatement. The abatement system is by underperforming or failed

Determination of $F_{N_2O, tail\ gas, h}$

The parameter $F_{N_2O, tail\ gas, h}$ is determined using the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 3.0).

In the case of Fertinal project, the mass flow of N_2O is calculated following Option A of the tool, since the moisture content of the gas stream is less than $0.05\text{ kg H}_2\text{O/m}^3$ dry gas.

Then, the equations 5 and 6 of the tool are applied as follows:

$$F_{N_2O, tail\ gas, h} = V_{h, dry} \times v_{N_2O, h, dry} \times \rho_{N_2O, h}$$

$$\rho_{N_2O, h} = \frac{P_h \times M_{N_2O}}{R_u \times T_h}$$

Where:

$F_{N_2O, tail\ gas, h}$ = Mass flow of N_2O in the gaseous stream in hour h (kg N_2O/h)

$V_{h, dry}$ = Volumetric flow of the gaseous stream in the hour h on a dry basis (m^3 dry gas/h)

$v_{N_2O, h, dry}$ = Volumetric fraction of N_2O in the gaseous stream in the hour h on a dry basis ($\text{m}^3\text{ }N_2O/\text{m}^3$ dry gas)

$\rho_{N_2O, h}$ = Density of N_2O in the gaseous stream in the hour h (kg $N_2O/\text{m}^3\text{ }N_2O$)

P_h = Absolute pressure of the gaseous stream in the hour h (Pa)

M_{N_2O} = Molecular mass of N_2O (kg/kmol)

R_u = Universal ideal gas constant (Pa. $\text{m}^3/\text{kmol. K}$)

T_h = Temperature of the gaseous stream in the hour h (K)

N_2O concentration and volume flow at the stack gas are monitored continuously; every two second readings are recorded and stored electronically. Hourly averages of the two seconds readings are also recorded and stored, those values are used in the emission reduction calculation.

The monitoring system is maintained according to the European Norm 14181.

Monitored values of N_2O concentration and volume flow at the stack are corrected with the factors obtained from the calibration curves during the QAL2 test. The correction factors are applied to the hourly average values in the emission reduction calculation spread sheet.

If data for either the N_2O concentration or the volume flow of the tail gas are not available for more than 1/3 of any hour while the plant was in operation, the value for that hour shall be replaced with the maximum value of N_2O concentration or volume flow of the tail gas observed during the monitoring period. Values observed during five operating hours before and after a plant start-up and shut-down shall not be used for the determination of the maximum values.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reduction conservatively calculated to be 249,670 tCO₂e per year for the selected crediting period.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

D.5. Validity of monitoring plan

Means of validation	DR,I																						
Findings	CAR-02, CL-03																						
Conclusion	<p>The project monitoring plan is in compliance (subject to closure of CAR-02, CL-03) with the monitoring methodology ACM0019 (version 02.0) /08/ and applicable tools /10/.</p> <p>It is CCIPL's opinion, that the monitoring arrangements described in the monitoring plan are feasible within the project design and the project participants are able to implement the monitoring plan.</p> <p><u>Parameters determined ex-ante</u> The following parameters are fixed ex-ante as per the requirements of applied methodology and applicable tools /08/ /10/:</p> <table border="1"> <thead> <tr> <th>Data and parameters</th> <th>Applied value</th> <th>Assessment</th> </tr> </thead> <tbody> <tr> <td>Operating pressure – Operating pressure of the ammonia burner</td> <td>364 kPa</td> <td>These values are as per the original PDD /04/ and further cross-checked against the plants specification documents /X/.</td> </tr> <tr> <td>EF_{historical}- Historical baseline emission factor of the nitric acid plant</td> <td>5.71 kg N₂O/t HNO₃</td> <td>These baseline emission factors were determined through the latest baseline campaign conducted in accordance with the methodology AM0034 /07/ and verified from the previous verification reports /05/</td> </tr> <tr> <td>EF_{default,y} Default emission factor according to the operating pressure of the ammonia burner in year y (related to 100 per cent pure acid)</td> <td>Since Fertinal Plant is a Medium pressure plant the values to be applied are: 2016: 7.8 , 2017: 7.6 2018: 7.4 2019: 7.2 2020: 7 2021: 6.8 2022: 6.6 2023: 6.4</td> <td>The values are applicable for medium pressure plants as per the requirement of the methodology applied /08/.</td> </tr> <tr> <td>EF_{new,y} Baseline N₂O emission factor for nitric acid production in year y (related to 100 per cent pure acid)</td> <td>Then, the values to be applied are: 2016: 3.2 , 2017: 3 2018: 2.8 2019: 2.7 2020: 2.5 2021: 2.5 2022: 2.5 2023: 2.5</td> <td>The values are as per the requirement of the methodology applied /08/.</td> </tr> <tr> <td>P_{product,max} Design capacity of nitric acid production during the first crediting period</td> <td>224,940 t HNO₃</td> <td>These values are as per the original PDD /04/</td> </tr> <tr> <td>GWP_{N2O}</td> <td>298 t CO₂e/t N₂O</td> <td>GWP_{N2O} is taken from relevant decisions by the CMP as stated in ACM0019 (version 02.0) /08/.</td> </tr> </tbody> </table>		Data and parameters	Applied value	Assessment	Operating pressure – Operating pressure of the ammonia burner	364 kPa	These values are as per the original PDD /04/ and further cross-checked against the plants specification documents /X/.	EF_{historical} - Historical baseline emission factor of the nitric acid plant	5.71 kg N ₂ O/t HNO ₃	These baseline emission factors were determined through the latest baseline campaign conducted in accordance with the methodology AM0034 /07/ and verified from the previous verification reports /05/	EF_{default,y} Default emission factor according to the operating pressure of the ammonia burner in year y (related to 100 per cent pure acid)	Since Fertinal Plant is a Medium pressure plant the values to be applied are: 2016: 7.8 , 2017: 7.6 2018: 7.4 2019: 7.2 2020: 7 2021: 6.8 2022: 6.6 2023: 6.4	The values are applicable for medium pressure plants as per the requirement of the methodology applied /08/.	EF_{new,y} Baseline N ₂ O emission factor for nitric acid production in year y (related to 100 per cent pure acid)	Then, the values to be applied are: 2016: 3.2 , 2017: 3 2018: 2.8 2019: 2.7 2020: 2.5 2021: 2.5 2022: 2.5 2023: 2.5	The values are as per the requirement of the methodology applied /08/.	P_{product,max} Design capacity of nitric acid production during the first crediting period	224,940 t HNO ₃	These values are as per the original PDD /04/	GWP_{N2O}	298 t CO ₂ e/t N ₂ O	GWP _{N2O} is taken from relevant decisions by the CMP as stated in ACM0019 (version 02.0) /08/.
Data and parameters	Applied value	Assessment																					
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EF_{default,y} Default emission factor according to the operating pressure of the ammonia burner in year y (related to 100 per cent pure acid)	Since Fertinal Plant is a Medium pressure plant the values to be applied are: 2016: 7.8 , 2017: 7.6 2018: 7.4 2019: 7.2 2020: 7 2021: 6.8 2022: 6.6 2023: 6.4	The values are applicable for medium pressure plants as per the requirement of the methodology applied /08/.																					
EF_{new,y} Baseline N ₂ O emission factor for nitric acid production in year y (related to 100 per cent pure acid)	Then, the values to be applied are: 2016: 3.2 , 2017: 3 2018: 2.8 2019: 2.7 2020: 2.5 2021: 2.5 2022: 2.5 2023: 2.5	The values are as per the requirement of the methodology applied /08/.																					
P_{product,max} Design capacity of nitric acid production during the first crediting period	224,940 t HNO ₃	These values are as per the original PDD /04/																					
GWP_{N2O}	298 t CO ₂ e/t N ₂ O	GWP _{N2O} is taken from relevant decisions by the CMP as stated in ACM0019 (version 02.0) /08/.																					

Ru Universal ideal gases constant	8314 Pa.m ³ /kmol.K	Ru is the universal ideal gases constant, as specified in "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 02.0.0) /10/.
MM_{N2O}	44.02 kg/kmol for N2O	MMN2O is the molecular mass of N2O, as specified in "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 02.0.0) /10/.

CC IPL is able to verify that all the ex-ante parameters required by ACM0019 (version 02.0) and the relevant tool have been clearly stated, referenced and used in the ex-ante emission reduction calculations. The authenticity and referencing of all the parameters have been clearly described in the emission reduction calculation sheet /02/ and was checked and verified by CC IPL.

Parameters monitored ex-post

The monitoring plan includes the operational and management structure to implement the monitoring plan and provisions to ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later. It defines responsibilities and arrangements for data collection and archiving and quality assurance and quality control (QA/QC) procedures. The uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables are also defined in the monitoring plan. Further, specifications of the calibration frequency for the measuring equipment are given as needed.

The following parameters will be monitored as per the requirements of applied methodology and applicable tools /08/ /10/:

- P_{production,y} (Nitric acid produced in year y): Plant daily production will be measured by using a magnetic type flow meter and corrected by the average of several concentration check-ups performed in the analytical lab. Calibration of devices used will be done on a routine basis according to the plant's maintenance program.
- h_y – Number of hours of operation in year y
- h_{r,y}- Number of hours (h) in year y where: (a) For secondary N₂O abatement. Abatement system was not installed, underperforming or failed;
- V_{h,db} Volumetric flow of the gaseous stream in the hour h on a dry basis – This value will be monitored by a monitoring system that meets the requirements of EN14181 as per the requirements of the methodology.
- v_{N2O,h,db} Volumetric fraction of N₂O in a hour h on a dry basis his will also be monitored by a monitoring system that meets the requirements of EN14811 as per the requirements of the methodology.

Furthermore, P_h and T_h (i.e. the absolute pressure and temperature of the gaseous stream in time interval t) will be monitored as per the requirements of the methodology.

The option used from the applicable tool for this Project is the option A (i.e. Volume flow on dry basis). The nitric acid produced P_{production,y} will be measured by using the

	<p>nitric acid flow meter. The flow will be converted into 100% acid by multiplying the mass flow of HNO₃ with concentration, which will be determined by the test in the laboratory. The number of hours of operation h_y will be obtained from plant operation records. The volumetric fraction of greenhouse gas I in a time interval t on a dry basis $V_{h,db}$ will be monitored by the AMS that complies with EN14181.</p> <p>CC IPL confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the mean of implementation of the monitoring plan is able to ensure the achievement of emission reductions. Recommendations.</p> <p>A detailed operational and management structure has been provided in the updated PDD /01/.</p>
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D.6. Crediting period

Means of validation	DR,I
Findings	--
Conclusion	Inline with the requirements of § 298 of PS, version 09.0, the Project participants had notified the UNFCCC secretariat of their intention in accordance with the Project cycle procedure. This has been done in accordance with § 291 of PCP version 09.0 as verified by reviewing the email /13/ sent by the project participant to the UNFCCC. Thus the next crediting period of the registered CDM project activity commences on the day immediately after the expiration of the current crediting period.

D.7. Project participants

Means of validation	DR,I
Findings	--
Conclusion	Validation team confirms that project participants 's names of the project participants included in the request for renewal of crediting period are same as reflected in the original PDD and the UNFCCC interface. The PP from the host country is the same as the original PDD, however the PP from annex 1 party has been changed as listed in the original PDD. Nonetheless, this change in PP of annex 1 party has been transparently listed in the UNFCCC project page. The approval and authorization of new PP of annex 1 party i.e. Nordic Environment Finance Corporation has been confirmed through the project page by reviewing the upaloded letter of approval from Finland.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	N	N/A	N/A
Corrections	N	N/A	N/A
Inclusion of a monitoring plan to a registered project activity	N	N/A	N/A
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	N	N/A	N/A
Changes to the project design of a registered project activity	N	N/A	N/A
Types of changes specific to afforestation and reforestation project activities	N	N/A	N/A

SECTION E. Internal quality control

The final validation report **will undergo** a technical review and quality reviewer before being submitted to the project participant(s) and UNFCCC Executive Board. The technical review is performed by a technical reviewer qualified in accordance with CC IPL's qualification scheme for CDM validation and verification.

SECTION F. Validation opinion

The validation team assigned by the DOE has been assigned by “Impulso Ecologico y Desarrollo Sustentable, SA de CV” to perform the validation of Renewal of Crediting Period for the project “Fertinal Nitrous Oxide Abatement Project”, UNFCCC registration No. 2585. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism.

CC IPL confirms that that the project participants have updated sections of the PDD relating to the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using the valid version(s) of the approved baseline and monitoring methodology applicable to the project activity.

As per the registered PDD, the methodology used was AM0034 ver. 3 – Catalytic reduction of N₂O inside the ammonia burner of nitric acid plants and the baseline was identified, as the scenario where the N₂O is emitted to the atmosphere with no N₂O abatement measure being implemented. The Methodology AM0034 ver. 3 1 prescribes the baseline as atmospheric release of the N₂O. This methodology was subsequently replaced by ACM0019: “N₂O abatement from nitric acid production” (Version 02.0). PP has correctly applied the applicable and valid methodology at the time of renewal of crediting period i.e. ACM0019. This is incompliance with the requirement of § 300 (b) of PS, version 09.0.

The applicability of the methodology has been assessed based on the knowledge of the project from the initial validation, subsequent verifications and the interviews from the project participant. The assessment of the project’s compliance with the applicability criteria of the methodology ACM0019 (version 02.0) as documented in the PDD, which are evaluated in detail under assessment above in this report. Thus the validation teams confirm (subject to closure of CL-01, CL-02 and CAR-02) the applicability of the selected methodology to the proposed CDM project activity.

As required by § 437 (a) of VVS, version 09, validation team has checked (a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant guidance from the Board with regard to renewal of the crediting period at the time of requesting renewal of crediting period. The assessment has been carried out as per the tool “assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” /B07/. Validation team based on confirmation from DNA and review of website /12/ confirms (subject to closure of CL-01) that no law or regulation which mandates the complete or partial destruction of N₂O from nitric acid plants exists in Mexico and thus it can be confirmed (subject to closure of CL-01) that the original baseline of the project as described in the registered PDD is still valid.

As required by § 437 (b) of VVS, version 09, validation team confirms the correctness of the application of the approved methodology for the determination of the continued validity of the baseline, and the estimation of emission reductions for the applicable crediting period of the registered CDM project activity. Validation team confirms (subject to closure of CL-01 and CL-02) that the applied the baseline and monitoring methodology applied in accordance with the applicable requirements in the Project standard. Validation team confirms that the baseline, the estimated GHG emission reductions or net anthropogenic GHG removals, and the monitoring plan in the updated PDD comply with the applicable requirements in the Project standard, and the valid version of the methodology and, applicable to the registered CDM project activity.

The project participants used a later valid version of the PDD form for the updated PDD than the version of the PDD of the registered PDD. Validation team confirms that the information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD . The updated PDD complies (subject to closure of CAR-01) with the valid version of the applicable PDD form and instructions therein for filling out the PDD form.

Validation team confirms that project participants 's names of the project participants included in the request for renewal of crediting period are same as reflected in the original PDD and the UNFCCC interface. The PP from the host country is the same as the original PDD, however the PP from annex 1 party has been changed as listed in the original PDD. Nonetheless, this change in PP of annex 1 party has been transparently listed in the UNFCCC project page. The approval and authorization of new PP of annex 1 party i.e. Nordic Environment Finance Corporation has been confirmed through the project page by reviewing the updaloded letter of approval from Finland.

The project participants had not requested any post-registration changes together with this request for renewal of crediting period of the registered CDM project activity.

Inline with the requirements of § 298 of PS, version 09.0, the Project participants had notified the UNFCCC secretariat of their intention in accordance with the Project cycle procedure. This has been done in accordance with § 291 of PCP version 09.0 as verified by reviewing the email /13/ sent by the project participant to the UNFCCC. Thus the next crediting period of the registered CDM project activity commences on the day immediately after the expiration of the current crediting period.

CC IPL concludes that the CDM Project Activity "Fertinal Nitrous Oxide Abatement Project" in Mexico, as described in the PDD/ 01/, meets (subject to closure of all findings) all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) Para 49 (a) and the subsequent decisions by the COP/MOP and CDM Executive Board. The selected baseline and monitoring methodologies (ACM0019, Version 02.0) are applicable (subject to closure of CL-01, CL-02 and CAR-02) to the project and correctly applied. The CC IPL therefore requests the approval of the renewal of the crediting period for the registered CDM project with UNFCCC.

Appendix 1. Abbreviations

Abbreviations	Full texts
AMS	Automated Measuring System
BAU	Business As Usual
CER	Certified Emission Reduction
CA	Corrective Action / Clarification Action
CDM	Clean Development Mechanism
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO₂	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entities
DVR	Draft Validation Report
EB	CDM Executive Board
EF	Emission Factor
FA	Final Approval
FAR	Forward Action Request
FVR	Final validation Report
GSC	Global Stakeholder Consultation
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
IPCC	Intergovernmental Panel on Climate Change
MWh	Mega Watt Hour
N₂O	Nitrous Oxide
OSV	On Site Visit
QC/QA	Quality control/Quality assurance
RCP	Renewal of Crediting Period
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/01/	Project Participant	PDD, version 1.0, dated 04/04/2016	Version 1.0, dated 04/04/2016	Project Participant
/02/	Project Participant	Emission reduction spread sheet.	--	Project Participant
/03/	UNFCCC	1. Validation and Verification Standard version 09.0 2. Project Standard version 09.0 3. Project Cycle Procedure version 09.0	--	UNFCCC
/04/	Project Participant	Registered PDD (version 2.7 and dated 04/05/2009) and corresponding validation report.	PDD version 2.7 ,dated 04/05/2009 and corresponding validation report	UNFCCC project page
/05/	UNFCCC project page	Documents available on UNFCCC website corresponding to verifications of the project activity.	--	UNFCCC project page
/06/	UNFCCC	Methodological Tool –Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”.	Version 3.0.1	UNFCCC
/07/	UNFCCC	AM0034 “Catalytic reduction of N2O inside the ammonia burner of nitric acid plants”	Version 3	UNFCCC
/08/	UNFCCC	ACM0019: “N2O abatement from nitric acid production” (Version 02.0).	Version 02.0	UNFCCC
/09/	UNFCCC	Instructions for filling out the project design document form for CDM project activities, version 06.0	Version 06.0	UNFCCC
/10/	UNFCCC	“Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 03.0)	Version 03.0	UNFCCC
/11/	UNFCCC	“Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion” (Version 2)	Version 03.0	UNFCCC
/12/	--	Websites referenced: 1. http://cdm.unfccc.int	--	--
/13/	--	Email and attachment (“Intention of renewing crediting period notification form” (CDM-RENN-FORM) sent to UNFCCC by Project participant	--	--
/14/	CC IPL	Email sent by CC IPL to DNA Mexico for confirmation on law or		

		regulation which mandates the complete or partial destruction of N ₂ O from nitric acid plants exists in the host country (Mexico) where the CDM project activity is implemented. DNA acknowledges receipt of email, confirmation still awaited.		
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Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	01	Section no.	Section B.2	Date: 02/05/2016
Description of CL				
As per section B.2, there is no law or regulation that would force Fertinal to abate the N ₂ O emissions in Mexico. This demonstration is anecdotal and hence it needs to be confirmed through regulatory analysis (by PP) and by interviewing the regulatory authorities that no law or regulation which mandates the complete or partial destruction of N ₂ O from nitric acid plants in Mexico.				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

CL ID	02	Section no.	Section B.3	Date: 02/05/2016
Description of CL				
The project involves installation of a secondary catalyst to abate N ₂ O inside the reactor once it is formed. The applied baseline and monitoring methodology provides a diagram of Project boundary (refer figure 1 page 5 of 17, ACM0019, version 02.0) for the illustration of project boundary for a secondary abatement technology. Review of section B.3 of the PDD however does not reveal any such illustration in the PDD as per the applied methodology. Please clarify.				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

CL ID	03	Section no.	Section B.6.2	Date: 02/05/2016
Description of CL				
<p>a) PP is requested to provide information of the latest baseline campaign conducted in accordance with the methodology AM0034, this required to validate EF historical as per the requirement of applied methodology (refer page 12 of 17, ACM0019, version 02.0).</p> <p>b) Furthermore, plant design data is also required to be furnished to validate the parameter Operating pressure and P_{product,max}</p>				
Project participant response				Date: DD/MM/YYYY

Documentation provided by project participant	
DOE assessment	Date: DD/MM/YYYY

Table 2. CAR from this validation

CAR ID	01	Section no.	Throughout PDD	Date: 02/05/2016
Description of CAR				
<p>The most recent PDD template has been used. As per § 436 of VVS, version 09.0, if the project participant has used a later valid version of the PDD form for the updated PDD than the version of the PDD form of the registered PDD, the information transferred to the later valid version of the form should be materially the same as that in the registered PDD. In context of this requirements, the following are not fully met:</p> <ul style="list-style-type: none"> a) Information in section A.1 does not contain any information on the sustainable development of the host country as originally explained in the registered PDD. This is also a requirements of PDD filling guideline. b) Information in section D.2 is missing. c) Section A.5 is marked N/A which is not correct. Also the appendix 2 is blank. d) Appendix 5 is blank, where as the registered PDD provides a detailed information in Annex-4. e) Tables in appendix 1 is not fully filled, please provide the complete information (contact details etc). f) Appendix 3, 4 and 6 is left blank, which is incorrect as per the PDD filling guidelines. 				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

CAR ID	02	Section no.	Section B.7.2	Date: 02/05/2016
Description of CAR				
<p>As per the requirement of the applied methodology (refer page 15 of 17, ACM0019, version 02.0) for the monitoring parameter “ P_{production,y} “, QA/QC procedure shall includes that measurement devices such as weight scales shall follow QA/AC supplier recommendations. The present write-up under the table of parameter is not meeting with the requirement of applied methodology.</p>				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23 March 2015	Initial publication.

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