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# VALIDATION REPORT

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## “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” in Brazil

REPORT No. 2007-2007

REVISION No. 02



# VALIDATION REPORT

DET NORSKE VERITAS  
CERTIFICATION AS

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Date of first issue: 2007-12-12	Project No.: 28624550
Approved by: Mari Grooss Viddal	Organisational unit: DNV Certification, International Climate Change Services
Client: Ultrafertil S/A	Client ref.: Ricardo Prado Santos

**Project Name:** "Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project"  
**Country:** Brazil  
**Methodology:** AM0034  
**Version:** 02  
**GHG reducing Measure/Technology:** "Catalytic reduction of N<sub>2</sub>O inside the ammonia burner of nitric acid plants"  
**ER estimate:** 766 884 over 7 years

## Size

- ☒ Large Scale  
☐ Small Scale

## Validation Phases:

- ☒ Desk Review  
☒ Follow up interviews  
☒ Resolution of outstanding issues

## Validation Status

- ☐ Corrective Actions Requested  
☐ Clarifications Requested  
☒ Full Approval and submission for registration  
☐ Rejected

In summary, it is DNV's opinion that the "Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project" in Brazil, as described in the revised PDD of 12 June 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0034 (Version 02). Hence, DNV will request the registration of the "Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project" as a CDM project activity. Prior to the submission of the validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

Report No.: 2007-2007	Date of this revision: 2008-06-19	Rev. No. 02
Report title: "Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project" in Brazil		
Work carried out by: Andrea Leiroz, Venkata Raman Kakaraparthi		
Work verified by: Trine Kopperud (applicant), Michael Lehmann		

Key words:

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### Abbreviations

AMS	Automated Measuring System
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change




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### 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” at the Fosfertil Cubatão nitric acid plant located in the municipality of Cubatão, São Paulo State, Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The project participants are Ultrafertil S/A of Brazil and Ecoinvest Carbon S.A. of Switzerland. The participating Parties - Brazil as host Party and Switzerland as Annex I Party - meet all relevant participation requirements.*

*The “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” consists of the installation of a secondary catalyst to abate N<sub>2</sub>O inside the reactor once it is formed in the nitric acid plant at the Fosfertil Cubatão nitric acid plant located in the municipality of Cubatão, São Paulo State, Brazil, operated by Ultrafertil S/A.*

*The project correctly applies the approved baseline and monitoring methodology AM0034 titled “Catalytic reduction of N<sub>2</sub>O inside the ammonia burner of nitric acid plants”. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. As required by AM0034, the baseline scenario was identified using the procedure for the “Identification of baseline scenario” described in the approved methodology AM0028 (Version 04.1) - “Catalytic N<sub>2</sub>O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants”. It is sufficiently demonstrated that the project is not a likely baseline scenario. An analysis of the economic attractiveness of the project alternative without the revenue from carbon credits demonstrates that the project is not a likely baseline scenario.*

*The total emission reductions from the project are estimated to be on the average 109 555 t CO<sub>2</sub>e per year over the selected 7 year crediting period. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change. Emission reduction calculations are transparently documented using the formulas established by AM0034. The algorithm and methodologies for accounting GHG emissions are appropriate and the emission factors are deemed to be of sufficient accuracy.*

*The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements.*

*In summary, it is DNV’s opinion that the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project”, as described in the project design document of 12 June 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology AM0034 (Version 02). Hence, DNV will request the registration of the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” as a CDM project activity.*

*Prior to the submission of the validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of*



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*Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.*



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## 2 INTRODUCTION

Ultrafertil S/A has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” at the Fosfertil Cubatão nitric acid plant located in the municipality of Cubatão, São Paulo State, Brazil. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

### 2.1 Objective

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

### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AM0034 (Version 02) /20/. The validation team has, based on the recommendations in the Validation and Verification Manual /19/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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




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### 3 METHODOLOGY

The validation consisted of the following three phases:

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

The following sections outline each step in more detail.

#### 3.1 Desk Review of the Project Design Documentation

The following table lists the documentation that was reviewed during the validation:

- /1/ MGM International Ltda: *Project Design Document for the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project”*. Version 2 of 7 December 2007.
- /2/ MGM International Ltda: *Project Design Document for the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project”*. Version 3 of 25 February 2008.
- /3/ MGM International Ltda: *Project Design Document for the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project”*. Version 4 of 12 June 2008.
- /4/ Ultrafertil emissions calculation datasheet (Fosfertil Cubatão NAP 4 – Baseline Emission factor calculation.xls)
- /5/ Spreadsheet of operation conditions (Fosfertil Cubatão NAP4 - Operation Conditions.xls)
- /6/ Spreadsheet of campaign length (Fosfertil Cubatão NAP4 - Campaign length.xls)
- /7/ Spreadsheet of nameplate capacity (Fosfertil Cubatão NAP4 - Name Plate.xls)
- /8/ Spreadsheet of operation conditions (Dados Históricos 6 Últimas Campanhas - UNAN - NAP4.xls)
- /9/ Spreadsheet of Calculation of Investment analysis (NPV) (NPV NAP 4 Cost`s CER`s until 2015 with and without revenues.xls)
- /10/ Fosfertil: AMS Purchase Order # 4500278027 issued on 24 April 2007 to ABB.
- /11/ Fosfertil: Bidding proposal for PDD developers, dated 24 July 2006.
- /12/ Ultrafertil - Operation Licence # 25000578 issued on 09 April 2008.
- /13/ Ultrafertil - Letters sent to local stakeholder and the comments received.
- /14/ Gauze operation condition – Umicore Brasil Ltda (5 July 2007).
- /15/ Gauze composition: chemical analysis certification – OMG Brasil Ltda (2002) and Umicore Brasil Ltda (2003 - 2007).
- /16/ QAL1 tests reports for the N2O Analyser (ABB) and QAL1 tests report for the flow meter (IPT – 28 September 2007).





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- /17/ QAL 2 test report: N<sub>2</sub>O measurements at Fosfertil nitric acid plant – SGS Environmental Services (December 2007).
- /18/ Uncertainty of the monitoring system (UNC calculations-Fofertil Cubatão NAP4-QAL1.xls)
- /19/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /20/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0034 - "Catalytic reduction of N<sub>2</sub>O inside the ammonia burner of nitric acid plants"*. Version 02.
- /21/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0028 - "Catalytic N<sub>2</sub>O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants"*. Version 04.1.
- /22/ CDM EB: *Tool for the demonstration and assessment of additionality*. Version 04.

### 3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topics
/23/	2007-12-17	María Inés Hidalgo	MGM International Ltda	• Evidence to demonstrate additionality of the project
/24/	2007-12-17	Ricardo Rodrigues da Costa	MGM International Ltda	• Monitoring plan • Environmental legal compliance
/25/	2007-12-17	Paulo Tossi	Ultrafertil S/A	• Campaign length historical data
/26/	2007-12-17	Antonio Carlos Vicente	Ultrafertil S/A	• Nameplate capacity
/27/	2007-12-17	Fernando Ferreira Luiz	Ultrafertil S/A	
/28/	2007-12-17	Salvador Guirado	Ultrafertil S/A	
/29/	2007-12-17	Luiz Gustavo B. Fernandes	Ultrafertil S/A	

### 3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

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The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” is enclosed in Appendix A to this report.

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

  

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), or a <b>corrective action request (CAR)</b> due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

  

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

**Figure 1 Validation protocol tables**



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

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

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

### 3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

### 3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team leader/CDM validator	Leiroz	Andrea	Brazil
Sector expert	Kakaraparthi	Venkata Raman	India
Technical reviewer (applicant)	Kopperud	Trine	Norway
Technical reviewer	Lehmann	Michael	Norway

The qualification of each individual validation team member is detailed in Appendix B to this report.



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### 4 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation of 12 June 2008.

#### 4.1 Participation Requirements

The Project participants are Ultrafertil S/A of Brazil and Ecoinvest Carbon S.A. of Switzerland. The participating Parties - Brazil as host Party and Switzerland as Annex I Party - meet all relevant participation requirements.

Prior to the submission of the validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

#### 4.2 Project Design

The “Fosfertil Cubatão NAP4 Nitrous Oxide Abatement Project” consists of the installation of a secondary catalyst to abate  $N_2O$  inside the reactor once it is formed. The project is at the Fosfertil Cubatão nitric acid plant located in the municipality of Cubatão, São Paulo State, Brazil, operated by Ultrafertil S/A.  $N_2O$  is generated as a by-product during the production of nitric acid and is released into the atmosphere in the absence of any regulations preventing this, and hence contributes to an increase of greenhouse gases in the atmosphere.

Nitrous oxide is formed during the catalytic oxidation of ammonia. Over a suitable catalyst, typically 92-96% of the fed ammonia is converted to nitric oxide (NO). The remainder participates in undesirable side reactions that lead to  $N_2O$ , among other compounds.

The current project activity consists of the installation of a new (not previously installed) catalyst below the oxidation gauzes (a “secondary catalyst”) whose sole purpose is the decomposition of  $N_2O$ .

The selected technology, a “secondary” catalyst that decomposes  $N_2O$  without affecting nitric acid production, is supplied by Johnson Matthey. Typically, the catalyst has a very high activity for  $N_2O$  decomposition (more than 85% of  $N_2O$  abatement can be reached).

The current nameplate capacity of the plant is 271.59 t  $HNO_3$ /day. Information the historical nitric acid production was assessed to confirm this estimate /6/7/.

A 7 years renewable crediting period is selected (with the potential of being renewed twice), starting on 21 September 2008. The starting date of the project activity is 24 April 2007, which corresponds to the date when the purchase order with the AMS supplier was issued /9/. The project activity has an expected operational lifetime of 25 years.

The project is expected to contribute to sustainable development objectives of the Brazilian Government focusing on industrial technology transfer and environmental impacts. In addition, the project activity will not cause job losses and will not impact on the local communities.



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The project does not involve public funding, and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.

### 4.3 Baseline Determination

The project applies the approved consolidated baseline methodology AM0034 (Version 02) - “Catalytic reduction of N<sub>2</sub>O inside the ammonia burner of nitric acid plants” /20/. This methodology is applicable to the project as this project consists of the installation of a dedicated decomposition device to convert the N<sub>2</sub>O into nitrogen, and thereby preventing its release to the atmosphere. The project meets the methodology’s applicability criteria:

- the plant is in operation since 1974;
- there is no existing N<sub>2</sub>O destruction equipment in the plant and the project will thus not result in the shut down of any existing N<sub>2</sub>O destruction or abatement facility or equipment in the plant;
- the nitric acid production level will not be affected by the project;
- there is no regulation that requires abatement of N<sub>2</sub>O in Brazil;
- there is no existing N<sub>2</sub>O destruction or abatement technology installed;
- there will be no increase of NO<sub>x</sub> emissions;
- the existing NO<sub>x</sub> abatement catalyst system is not a Non Selective Catalytic Reduction (NSCR) DeNO<sub>x</sub> unit;
- the project activity will not lead to any new process emissions of greenhouse gases, directly or indirectly;
- the continuous real-time measurements of N<sub>2</sub>O concentration and total gas flow rate can be carried out in the exit of the process.

As required by AM0034, the baseline scenario was identified using the procedure for the “Identification of baseline scenario” described in the approved methodology AM0028 (Version 04.1) - “Catalytic N<sub>2</sub>O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants” /21/.

The methodology application first involves an identification of possible baseline scenarios, and eliminating those that do not qualify. The analysis demonstrates that the only feasible baseline is a continuation of the status quo, which meets current regulations, and requires neither additional investments nor additional running costs. Therefore, the continuation of the current situation can be selected as the baseline scenario.

The explanation of methodological choices is clearly described. Baseline emissions are determined by measuring N<sub>2</sub>O concentration and total flow rate in the tail gas of the nitric acid plant. At the time of writing this report the baseline campaign is still being carried out. The campaign started in 10 November 2007 and will not finish until September 2008.

The PDD only contains an estimate for the baseline emissions factor representing the average N<sub>2</sub>O emissions per tonne of nitric acid. The results from the baseline campaign and thus the actual baseline emissions factor being used to determine baseline emissions will be subject to verification by the verifying DOE.



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### 4.4 Additionality

The start date of the project activity is 24 April 2007, corresponding to the date the AMS purchase order was issued /9/. DNV was able to verify that CDM benefits were taken into account before the starting date of the project. It was demonstrated that CDM benefits were considered prior to the project starting by the bidding proposal for PDD developers issued by Fosfertil on 24 July 2006 /10/.

In accordance with AM0034, the additionality of the project is demonstrated through the “*Tool for the demonstration and assessment of additionality*” which includes the following steps:

*Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations:* The possible scenarios are identified, i.e. i) current situation where there will be no installation of technology for destruction or abatement of N<sub>2</sub>O, ii) switch to alternative production method not involving ammonia oxidation process, iii) alternative use of N<sub>2</sub>O, iv) installation of an N<sub>2</sub>O destruction or abatement technology (secondary approach).

The provided alternatives are in compliance with the legal and regulatory requirements.

As required by AM0034, the baseline scenario was identified using the procedure for “Identification of baseline scenario” described in the approved methodology AM0028 (Version 04.1) - “*Catalytic N<sub>2</sub>O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants*” /21/. The selection of alternative scenarios was as described in section 4.3 of this report.

*Step 2 - Investment analysis:*

*Sub-step 2a. Determine appropriate analysis method:* As catalytic N<sub>2</sub>O destruction facilities generate no financial or economical benefits other than CDM related income, a simple cost analysis is applied.

*Sub-step 2b. – Apply simple cost analysis:* The proposed CDM project activity is, without the revenues from the sale of certified emission reductions, less economically and financially attractive than the baseline scenario. The investment analysis provided shows that the only revenue arises from sales of CER’s. The investment consists of the engineering, construction, shipping, installation and commissioning of the secondary catalyst and the measurement equipment. The operating costs consist of the regular change of the catalyst as well as personnel costs for the supervision of the measurement equipment. The NPV for the sum of investments and associated costs was considered for a project time horizon of 9 years. In addition, an investment analysis considering the income from the CER’s was presented for the entire crediting period.

*Step 3 - Barrier analysis:* A barrier analysis is not used for demonstrating additionality in this project.

*Step 4 - Common practice analysis:* N<sub>2</sub>O secondary abatement is not common practice in Brazil. Usually the nitric acid industry releases into the atmosphere the N<sub>2</sub>O generated as a by-product of the nitric acid production, as it does not have any economic value or toxicity at typical emission levels.

Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions are thus additional.



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### 4.5 Monitoring

The project applies the approved consolidated monitoring methodology AM0034 (Version 02) - *“Catalytic reduction of N<sub>2</sub>O inside the ammonia burner of nitric acid plants”*.

The monitoring plan takes into account baseline emissions and project emissions, considering the quality control and quality assurance for data monitoring. The nitric acid plant has installed continuous gas analyzers and flow meters in the stack. The European norm EN14181:2004, which is referred to in AM0034 for the selection and operation of the automatic measuring system (AMS), has been used. All three levels of quality assurance are clearly described in the PDD comprising the following:

QAL 1: Suitability of the AMS for the specific measuring task

QAL 2: Validation of AMS following installation

QAL 3: Ongoing quality assurance during operation

The QAL 2 tests, including measurements with a standard reference method, were performed by a laboratory which has an accredited quality assurance system according to EN ISO/IEC 17025 /17/.

#### 4.5.1 Parameters monitored ex-post

Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. All data will be kept until two years after the end of the crediting period.

#### 4.5.2 Management system and quality assurance

Responsibilities and authorities for project management, monitoring and reporting project activities as well as for organizing and training of the staff in the appropriate monitoring, measurement and reporting techniques and QA/QC procedures are clearly defined. The project will require additional training and project maintenance as described in the PDD.

Ultrafertil's plant is ISO 9001:2000 certified and is working on the implementation of ISO 14001:2004 certification. All necessary procedures related to the monitoring of the project will be fully integrated into Ultrafertil's quality and environmental management system.

### 4.6 Estimate of GHG Emissions

The project boundary comprises the physical, geographical site of Fosfertil NAP4 at the Cubatão site and equipment for the complete nitric acid production process from the inlet to the ammonia burner to the stack.

The project activity only comprises the GHG N<sub>2</sub>O. No leakage calculations are required according to AM0034.

Emission reduction calculations are correctly applied and transparently documented using the formulas established by AM0034.

The estimated amount of GHG emission reductions from the project is 766 884 tones CO<sub>2</sub> equivalents (tCO<sub>2</sub>e) during the renewable 7 years crediting period, resulting in estimated average annual emission reductions of 109 555 tCO<sub>2</sub>e.

The calculation of emission reductions for the project activity is based on the baseline campaign data obtained at the time of validation. Since N<sub>2</sub>O emissions tend to increase at the end of the campaign (related to the reduced efficiency of the primary catalyst for ammonia



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oxidation), applying the baseline data obtained so far results in a conservative emission reduction estimate. A spreadsheet for the calculation of the emission reductions was provided to confirm this estimate.

The uncertainty of the monitoring system is estimated and uncertainties are considered in the calculation of the estimated emission reductions as required by AM0034.

The baseline emission factor, to be used for calculation of emission reduction during the crediting period, will be established when the baseline campaign is finished. The final baseline emission factor for the plant shall be adjusted in accordance to the results of the entire baseline campaign length, the results of the QAL 2 test (adjustments according to the calibration functions for N<sub>2</sub>O analyser and stack gas flow), and the recommendations given to include a filter for excluding incorrect data (such as N<sub>2</sub>O concentration values measured during zero and span calibration). The final baseline emission factor shall be verified as the first step of the verification by the DOE performing the Verification of this CDM project.

### 4.7 Environmental Impacts

Ultrafertil S/A has been granted an Operational Licence #25000578 issued on 9 April 2008 by the Environmental Agency of the State of São Paulo (CETESB) and this licence is valid until 9 April 2010. Ultrafertil reported the implementation of the project activity to CETESB. As stated in the national regulation, an EIA is not necessary for this activity.

### 4.8 Comments by Local Stakeholders

Local stakeholders, such as the municipal government, the state and municipal agencies, the Brazilian forum of NGOs, the Alderman Chamber, the justice prosecution, the centre of industries and the workers syndicate, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA.

The letters sent to the local stakeholders were verified during the desk review.

Two comments were received. However, both comments were positive and the project design did not require any significant modification.

### 4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 7 December 2007 was made publicly available on DNV's climate change website ([www.dnv.com/certification/climatechange](http://www.dnv.com/certification/climatechange)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 13 December 2007 to 11 January 2008. No comments were received.



**APPENDIX A**

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**CDM VALIDATION PROTOCOL**

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

Requirement	Reference	Conclusion
<b>About Parties</b>		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	Table 2, Section A.2.1 The PDD identifies Ecoinvest Carbon S.A. (Switzerland) as Annex I project participants.
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	Table 2, Section A.2.
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	Prior to the submission of the validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	Table 2, Section A.2 Prior to the submission of the validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of

Requirement	Reference	Conclusion
		Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima.  The Swiss designated national authority for the CDM is the Federal Office for the Environment FOEN, Climate Unit.
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	Brazil has ratified the Kyoto Protocol on 23 August 2002.  Switzerland has ratified the Kyoto Protocol on 9 July 2003.
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	The assigned amount of emissions for Switzerland is 92% of that in 1990.
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto	CDM Modalities and	A national system for Switzerland has been established and it reports

Requirement	Reference	Conclusion
Protocol Article 5 and 7.	Procedures §31b	its national inventory to UNFCCC regularly.
<b>About additionality</b>		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	Table 2, Section B.3.1
<b>About forecast emission reductions and environmental impacts</b>		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	Table 2, Section B.4 to B.7
<b>For large-scale projects only</b>		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	Table 2, Section D.
<b>About stakeholder involvement</b>		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	Table 2, Section E.
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	The PDD of 7 December 2007 was made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were through the CDM website

Requirement	Reference	Conclusion
		invited to provide comments during a 30 days period from 13 December 2007 to 11 January 2008. No comments were received.
<b>Other</b>		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	Table 2, Section B.1.1
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	Table 2, Section B.2
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	Table 2, Section B.2
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	The project design document conforms to version 03.1 of the CDM-PDD.
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	Ok.

**Table 2 Requirements Checklist**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1. Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/ /3/	DR	The project is at the Fosfertil Cubatão nitric acid plant located in the municipality of Cubatão, São Paulo State, Brazil.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/ /3/	DR	The project boundary comprises the physical, geographical site of Fosfertil NAP 4 at Cubatão site and equipment for the complete nitric acid production process from the inlet to the ammonia burner to the stack.		OK
<b>A.2. Participation Requirements</b> <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/ /3/	DR	The project participants are Ultrafertil S/A of Brazil and Ecoinvest Carbon S.A. of Switzerland. The participating Parties - Brazil as host Party and Switzerland as Annex I Party - meet all relevant participation requirements.		OK
A.2.2. Have all involved Parties provided a valid and	/1/	DR	Prior to the submission of the validation	—	--

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complete letter of approval and have all private/public project participants been authorized by an involved Party?	/3/		report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.		
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /3/	DR	Yes, Brazil and Switzerland fulfil all requirements.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/ /3/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.		OK
<b>A.3. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/ /3/	DR	The project involves the installation of a secondary catalyst in the ammonia oxidation reactor in the nitric acid production process to abate nitrous oxide inside the reactor. The project does not involve any major changes with regard to the manufacturing technology		OK

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			and reflects current good practices.		
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /3/	DR	This project activity uses a catalyst that has the property of decomposing N <sub>2</sub> O.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/ /3/	DR	No procedures for training of monitoring personnel are mentioned in the monitoring plan. DNV requests further clarifications about the training.	CL2	OK
<b>A.4. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /3/	DR	Prior to the submission of the validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and DNA of Switzerland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.	—	--
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /3/	DR	The project is expected to contribute to sustainable development objectives of the Brazilian government focusing on industrial technology transfer and environmental impacts. In addition, the project activity will not cause job losses and will not impact on the local communities.		OK



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /3/	DR	The project applies the approved baseline methodology AM0034 “Catalytic reduction of N <sub>2</sub> O inside the ammonia burner of nitric acid plants” and the steps for the identification of the baseline scenario of the approved methodology AM0028 “Catalytic N <sub>2</sub> O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants”.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /3/	DR	Yes, the project fulfils the conditions under which AM0034 is applicable.		OK
<b>B.2. Baseline Scenario Determination</b> <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/ /3/	DR	Baseline scenario has been defined as the continuation of the current situation, where there will be no installation of technology for the destruction or abatement of N <sub>2</sub> O.		OK

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B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /3/	DR	<p><b>Step 1a:</b> The baseline scenario alternatives should include all possible options that are technically feasible to handle N<sub>2</sub>O emissions. The possible baseline scenarios are:</p> <ul style="list-style-type: none"> <li>• Continuation of <i>status quo</i>. The continuation of the current situation, where there will be no installation of technology for the destruction or abatement of N<sub>2</sub>O.</li> <li>• Switch to alternative production method not involving ammonia oxidation process</li> <li>• Alternative use of N<sub>2</sub>O, such as: <ul style="list-style-type: none"> <li>○ Recycling N<sub>2</sub>O as a feedstock</li> <li>○ Use of N<sub>2</sub>O for external purposes</li> </ul> </li> <li>• The installation of an N<sub>2</sub>O destruction or abatement technology: <ul style="list-style-type: none"> <li>○ Primary approach</li> <li>○ Secondary approach</li> <li>○ Tertiary approach, including Non Selective Catalytic Reduction (or NSCR De NO<sub>x</sub>)</li> <li>○ Quaternary (or end of pipe) approach.</li> </ul> </li> </ul> <p>The options include the CDM project activity not implemented as a CDM project. The only feasible baseline is the continuation of the <i>status quo</i>, which meets current regulations, and requires neither additional</p>		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			investments nor additional running costs.		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /3/	DR	As required by AM0034, the baseline scenario was identified using the procedure for the " <i>Identification of baseline scenario</i> " described in the approved methodology AM0028 (Version 04.1) - " <i>Catalytic N<sub>2</sub>O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants</i> ". The methodology application first involves an identification of possible baseline scenarios, and eliminating those that would not qualify. It is demonstrated that the only feasible baseline is a continuation of the <i>status quo</i> , which meets current regulations, and requires neither additional investments nor additional running costs. Therefore, the continuation of the current situation can be selected as the baseline scenario.		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /3/	DR	Baseline scenario has been defined as the continuation of the current situation, where there will be no installation of technology for the destruction or abatement of N <sub>2</sub> O in accordance with AM0028 as required by AM0034.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /3/ /12/	DR	In Brazil there is currently no regulation that requires abatement of N <sub>2</sub> O and the relevant air pollution control legislations pertain only to NO <sub>x</sub> levels in stacks (250 ppmv).		OK

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			NOx levels at Fosfertil Cubatão NAP 4 is lower than or equal at 200 ppmv.		
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /3/	DR	See B.2.2. All literature and sources are clearly referenced.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/ /3/	DR	The methodology also takes into account the possible risk of changing regulation with proper adjustments to the baseline N <sub>2</sub> O decomposition rates.		OK
<b>B.3. Additionality Determination</b> <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /3/	DR	In accordance with AM0034, the additionality of the project is demonstrated through the <i>“Tool for the demonstration and assessment of additionality”</i> .		OK
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/ /3/	DR	Yes		OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /3/ /9/	DR	<i>Step 2 - Investment analysis:</i> <i>Sub-step 2a. Determine appropriate analysis method:</i> As catalytic N <sub>2</sub> O destruction facilities generate no financial or economical benefits other than CDM related income, a		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>simple cost analysis is applied.</p> <p><i>Sub-step 2b. – Apply simple cost analysis:</i> The proposed CDM project activity is, without the revenues from the sale of certified emission reductions, less economically and financially attractive than the baseline scenario. The investment analysis provided shows that the only revenue arises from sales of CER's. The investment consists of the engineering, construction, shipping, installation and commissioning of the secondary catalyst and the measurement equipment. The operating costs consist of the regular change of the catalyst as well as personnel costs for the supervision of the measurement equipment.</p> <p>The investment analysis including the income from CER's should also be provided. In addition, evidence is to be provided for the investment and operation and maintenance costs.</p> <p><i>Step 3 - Barrier analysis:</i> A barrier analysis is not used for demonstrating additionality in this project.</p> <p><i>Step 4 - Common practice analysis:</i> N<sub>2</sub>O secondary abatement is not common practice in Brazil. Usually the nitric acid industry releases into the atmosphere the N<sub>2</sub>O</p>	CL4	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			generated as a by-product of the nitric acid production, as it does not have any economic value or toxicity at typical emission levels.		
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /3/	DR	The start date of the project activity is 24 April 2007, corresponding to the date the AMS purchase order was issued. DNV was able to verify that CDM benefits were taken into account before the starting date of the project. It was demonstrated that CDM benefits were considered prior to the project starting by the bidding proposal for PDD developers issued by Fosfertil on 24 July 2006.		OK
<b>B.4. Calculation of GHG Emission Reductions – Project emissions</b> <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/ /17/	DR	The ex-ante estimation of the project emission has been based on the following assumptions: the reduction in the N <sub>2</sub> O in the tail gases will be 85% and the nitric acid production has been considered to be 94 512 t/year based on the average daily production observed during 5 historical campaigns and number of operating days per year of 348 days. An overall uncertainty of 5.95% is used		OK

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			in the estimation. The stack gas flow and the N <sub>2</sub> O concentration are based on baseline campaign data obtained at the time of validation.		
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/ /3/	DR	See B.4.1.		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/ /3/	DR	See B.4.1.		OK
<b>B.5. Calculation of GHG Emission Reductions – Baseline emissions</b> <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/	DR	Emission reduction calculations are correctly applied and transparently documented using the formulas established by AM0034. The HNO <sub>3</sub> production has been considered at 94 512 t/year. The final baseline emission factor shall be calculated and verified after the end of the baseline campaign when all data are available. Updated spreadsheet shall be submitted to the verifying DOE. A spreadsheet for the calculation of the		OK

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			emission reductions was provided to confirm this estimate.		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/ /3/	DR	See B.5.1 and B.4.1.		OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/ /3/	DR	See B.5.1 and B.4.1.		OK
<b>B.6. Calculation of GHG Emission Reductions – Leakage</b> <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/	DR	As per AM0034, leakage is not to be considered.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/ /3/	DR	See B.6.1.		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/ /3/	DR	See B.6.1.		OK
<b>B.7. Emission Reductions</b> <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					

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B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/ /3/	DR	The project is expected to reduce CO2 emissions to the extent of 766 884 tCO2e (109 555 tCO2e/year on average) during the first renewable 7 years crediting period.  The uncertainty of the monitoring system is estimated and uncertainties are considered in the calculation of the estimated emission reductions as required by AM0034.		OK
<b>B.8. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/	DR	Yes, the approved monitoring methodology which is in conjunction with the baseline methodology AM0034 has been used.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/ /3/	DR	Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. All data will be kept until two years after the end of the crediting period.		OK
<b>B.9. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the	/1/ /3/	DR	Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data		OK

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greenhouse gas emissions within the project boundary during the crediting period?			archiving seems appropriate for the project. All parameters measured during projects campaigns will be archived in electronic and paper format for at least two years.		
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/ /3/	DR	See B.9.1		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/ /3/	DR	See B.9.1		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/ /3/	DR	Yes. The N <sub>2</sub> O concentration is measured by an infrared gas analyzer and the stack gas flow is measured by an ANNUBAR device with automatically compensation for stack pressure and temperature. The nitric acid production is measured by using a magnetic flow meter.		OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/ /3/	DR	See B.9.1		OK
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/ /3/	DR	See B.9.1		OK

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B.9.7. Is the <i>registration, monitoring, measurement</i> and <i>reporting</i> procedure defined?	/1/ /3/	DR	The monitoring plan is straightforward and the established QA/QC procedures will be included in the quality and environmental management system, certified as ISO 9001/2000 and ISO 14001/2004.		OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /3/	DR	The procedures for maintenance of monitoring equipment and reporting are identified in the PDD. Maintenance and service logs will be kept at Fosfertil Cubatão NAP 4 and made available for auditing purposes. For AMS, a QAL 3 according to EN14181, is described in the PDD and states that documented calibration procedure for weekly zero and span checks as well as resulting Shewart charts will be available on site for validation and future verifications.		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/ /3/	DR	Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project.  All parameters measured during projects campaigns will be archived in electronic and paper format for at least two years.		OK
<b>B.10. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the	/1/	DR	In line with the methodology, the baseline		OK

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collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/3/ /14/ /15/		<p>emissions will be calculated from the concentration of N<sub>2</sub>O monitored in the stack gas, the volume stack gas flow and the operating hours of the campaign.</p> <p>The baseline emission factor (t N<sub>2</sub>O/ t HNO<sub>3</sub>) is to be arrived from the parameters monitored during the baseline campaign, the GWP of N<sub>2</sub>O, the operating hours and the nitric acid produced during the campaign. During the crediting period of the project the baseline emission factor is to be reassessed in case of change in the catalyst composition/changes in the regulations. Since Brazil does not have any regulation for the abatement of N<sub>2</sub>O, the baseline emission factor will be used as such.</p> <p>The nitric acid production and the operating hours are monitored.</p> <p>The baseline campaign for the determination of the baseline emission factor is in progress. All the data available up to the date of validation have been submitted by the project participant, including spreadsheet calculations showing the statistical procedures used according to the requirement in AM0034. Due to lack of sufficient historical data, the permitted operating ranges for the ammonia oxidation temperature and</p>		

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			<p>pressure are determined from the design data. For the determination of the maximum ammonia flow and the ammonia/air ratio, data from the gauze supplier are used. The precious metal gauze composition used in the baseline campaign is the same as the gauzes used in the historical campaigns. The normal campaign length is determined from 5 historical campaigns. The spreadsheets including all baseline campaign data and campaign length are to be presented for verification.</p> <p>All parameters measured during the baseline campaign will be archived in electronic and paper format during the entire crediting period.</p>		
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/ /3/	DR	N <sub>2</sub> O is the only GHG indicator that needs to be accounted for in the baseline and it has been taken care of in the monitoring plan.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/ /3/	DR	Yes, it will be possible to monitor the specified baseline indicators.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/ /3/	DR	Yes. The N <sub>2</sub> O concentration is measured by an infrared gas analyzer and the stack gas flow is measured by an ANNUBAR device with automatic compensation for stack pressure and temperature. The nitric acid production is measured by using a magnetic		OK

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			flow meter.		
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/ /3/	DR	Yes. The monitoring procedures will be fully integrated into the Quality and Environmental Management System.		OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/ /3/	DR	Yes. The baseline stack flow and N <sub>2</sub> O concentration are measured during a complete campaign before project implementation and recorded every two seconds. The nitric acid production is measured daily.		OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/ /3/	DR	Yes. The monitoring plan is straightforward and the established QA/QC procedures will be included in the quality and environmental management system, certified as ISO 9001/2000 and ISO 14001/2004.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /3/	DR	The procedures for maintenance of monitoring equipment and reporting are identified in the PDD.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/ /3/	DR	Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. All parameters measured during the baseline campaign will be archived in electronic and paper format during the entire crediting		OK

\* MoV = Means of Verification, DR= Document Review, I= Interview  
CDM Validation 2007-2007, rev. 02

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			period.		
<b>B.11. Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /3/	DR	As per AM0034, leakage is not to be considered.		OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/ /3/	DR	See B.11.1.		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/ /3/	DR	See B.11.1.		OK
<b>B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /3/	DR	The monitoring methodology AM0034 does not require the monitoring of social and environmental indicators.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/ /3/	DR	See B.12.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/ /3/	DR	See B.12.1		OK
<b>B.13. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/ /3/	DR	The authority and responsibility of the project management are clearly described. The plant manager will be responsible for the ongoing operation and maintenance of the N <sub>2</sub> O monitoring system.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/ /3/	DR	The authority and responsibility for registration, monitoring, measurement and reporting are described. All trainings required as consequence of the implementation of the CDM project activity were already developed by Ultrafertil and included as part of the ISO 9000 standard procedures.		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /3/	DR	Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed and need clarification.	<del>CL-3</del>	OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	Yes. The monitoring technician will be responsible to analyze data and assure		OK



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/3/		appropriate and consistent procedural application during report preparation.		
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/ /3/	DR	Yes.		OK
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/ /3/	DR	The project starting date is 24 April 2007, , corresponding to the date when the purchase order with the AMS supplier was signed. The expected lifetime of the project is 25 years.		OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/ /3/	DR	A renewable 7-year crediting period (with the potential of being renewed twice) was selected, starting on 21 September 2008.		OK
<b>D. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /3/	DR	Ultrafertil S/A has been granted an Operational Licence #25000578 issued on 9 April 2008 by the Environmental Agency of the State of São Paulo (CETESB) and this licence is valid until 9 April 2010. DNV requests documented evidences that Ultrafertil already reported the	<del>CL</del> 4	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			implementation of the project activity to CETESB. As stated in the national regulation, an EIA is not necessary for this activity.		
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /3/	DR	According to the PDD, an EIA is not necessary for this activity. DNV requests documented evidences that Ultrafertil already reported the implementation of the project activity to CETESB.	<del>CL</del> 4	OK
D.1.3. Will the project create any adverse environmental effects?	/1/ /3/	DR	The project will not affect the environment in any adverse way.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /3/	DR	There are no transboundary environmental impacts.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /3/	DR	The project does not have any adverse environment impact.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/ /3/	DR	See D.1.1	<del>CL</del> 4	OK
<b>E. Stakeholder Comments</b> <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	/1/ /3/	DR	Local stakeholders, such as the municipal government, the state and municipal		OK

\* MoV = Means of Verification, DR= Document Review, I= Interview  
CDM Validation 2007-2007, rev. 02

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>agencies, the Brazilian forum of NGOs, the Alderman Chamber, the justice prosecution, the centre of industries and the workers syndicate, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA.</p> <p>The letters sent to the local stakeholders were verified during the desk review.</p> <p>Two comments were received. However, both comments were positive and the project design did not require any significant modification.</p>		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /3/	DR	See E.1.1		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/ /3/	DR	See E.1.1		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/ /3/	DR	See E.1.1		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/ /3/	DR	See E.1.1		OK

**Table 3 Resolution of Corrective Action and Clarification Requests**

<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
CL 1 The investment analysis including the income from CER's should also be provided. In addition, evidence is to be provided for the investment and operation and maintenance costs.	B.3.3	Fosfertil showed the datasheet during the validation site visit.	A copy of the investment analysis spreadsheet (Fosfertil Project Investment and Costs - NAP4.xls) was provided. This CL is closed.
CL 2 No procedures for training of monitoring personnel are mentioned in the monitoring plan. DNV requests further clarifications about the training.	A.3.3	Changes have been introduced into PDD. See page 56.	Version 3 of the PDD was assessed and the changes done in the monitoring plan are sufficient. Also, documented evidences for the initial training were sent to the DOE. This CL is closed.
CL 3 Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed and need clarification.	B.13.3	Fosfertil showed the procedures during the validation site visit	Documented evidences for the emergency procedures were available during the site visit. The procedures for emergency are included in the ISO 9000 standard procedures. This CL is closed.
CL 4 DNV requests documented evidences that Ultrafertil already reported the implementation of the project activity to CETESB.	D.1.1 D.1.2 D.1.6	A letter was sent to CETESB reporting the implementation of the CDM Project and resulted in approval letter. According with CONANA Resolution 237, an EIA is not necessary because the project does not affect the environment.	A copy of the letter sent to CETESB was sent to the DOE. This CL is closed.

## **APPENDIX B**

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### **CERTIFICATES OF COMPETENCE**



# CERTIFICATE OF COMPETENCE

***Michael Lehmann***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3 & 9		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director



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## CERTIFICATE OF COMPETENCE

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***Trine Kopperud***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	--	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	Yes	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	Sectoral scope 5		
<b><i>Technical Reviewer for (group of) methodologies:</i></b>			

Høvik, 5 February 2007

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*



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## CERTIFICATE OF COMPETENCE

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***Andrea Leiroz***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	Yes	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	Yes	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	--		

Høvik, 18 July 2007

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*





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## CERTIFICATE OF COMPETENCE

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***Raman Venkata Kakaraparthi***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	--	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 5		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 22 December 2006

**Einar Telnes**  
*Director, International Climate Change Services*

**Michael Lehmann**  
*Technical Director*